



GOVERNMENT OF ASSAM
PROJECT MANAGEMENT UNIT (PMU)
ASSAM PROJECT ON FOREST AND BIODIVERSITY CONSERVATION SOCIETY (APFBCS)
ARANYA BHAWAN, PANJABARI, GUWAHATI - 781037
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Project: AFD financed Assam Project on Forest & Biodiversity Conservation - Phase II

**BIDDING DOCUMENT
FOR
PROCUREMENT OF WORKS
NATIONAL PROCUREMENT COMPETITION**

**CONSTRUCTION OF ARANYA BHAWAN ANNEX
BUILDING AT PANJABARI, GUWAHATI**

IFB No: APFBC/PMU/Phase-II/AB/2022/245/10,

Dated: 08th September 2022.

Bidding Document Issued from: 09th September 2022.

Government of Assam
AFD financed
Assam Project on Forest & Biodiversity Conservation- Phase II
Assam Project on Forest & Biodiversity Conservation Society (APFBCS)
Aranya Bhawan, Panjabari, Guwahati- 781037; Website: www.apfbcn.nic.in; Email: pd@apfbcn.in;

INVITATION FOR BIDS (IFB)
NATIONAL PROCUREMENT COMPETITION (NPC)

IFB No. APFBC/PMU/Phase-II/AB/2022/245/10, Dated Guwahati the 8th September 2022.

Contract Title: CONSTRUCTION OF ARANYA BHAWAN ANNEX BUILDING AT PANJABARI, GUWAHATI.

The Assam Project on Forest and Biodiversity Conservation Society (APFBCS) has received funds from the Agence Française de Développement ("AFD") towards the cost of "Assam Project on Forest and Biodiversity Conservation-Phase II". The Project Director, APFBCS invites Bids from eligible bidders for the aforementioned **works** under the project. Hard copy of the Bidding document may be purchased in the manner specified in the website of APFBCS or the Bidding document may be downloaded free of cost from the website of APFBCS viz. www.apfbcn.nic.in from **09th September 2022 to 1st November 2022**. Detailed IFB Notice may be seen in the website of APFBCS.

1. Last date and time of submission of Bid **2nd November 2022 (14.00 hrs-IST)**
2. Date and time of opening of Bid **2nd November 2022 (14.15 hrs-IST)**

Sd/-
Project Director,
PMU, APFBC Society

NATIONAL PROCUREMENT COMPETITIVE (NPC)
INVITATION FOR BID (IFB)

Date: 08th September 2022.

Project Name: Assam Project on Forest and Biodiversity Conservation- Phase II.

IFB No: APFBC/PMU/Phase-II/AB/2022/245/10.

1. The Assam Project on Forest and Biodiversity Conservation Society (APFBCS) has received funds from the *Agence Française de Développement* ("AFD") towards the cost of "Assam Project on Forest and Biodiversity Conservation- Phase II". It is intended that part of the proceeds of these funds will be applied to eligible payments under the contracts for "Construction of Aranya Bhawan Annex Building at Panjabari, Guwahati".
2. The Project Director, PMU, APFBCS, now invites sealed Bids from eligible Bidders for for the construction and completion of "Construction of Aranya Bhawan Annex Building at Panjabari, Guwahati" ("**the Works**"):
3. Interested eligible Bidders may obtain further information from and inspect the Bidding Document at the office of the Project Director, PMU, APFBCS, 3rd Floor, Aranya Bhawan, Panjabari, Guwahati- 781037 (Assam), Telephone: +91-361-2733917, Email: pd@apfbcn.in; Website: www.apfbcn.in.
4. A complete set of Bidding Document may be purchased by interested Bidders on submission of a written application to the above and upon payment of a non-refundable fee of INR 5,900/- (Fee INR 5,000/- plus GST INR 900/-) only in the form of Demand Draft in favour of the "Assam Project on Forest and Biodiversity Conservation Society Phase II payable at Guwahati", Assam. Bidding Document may also be downloaded free of cost from the website of APFBCS viz. www.apfbcn.in. In case the Bidding Documents are downloaded from website, the non-refundable fee is not required.
5. The provisions in the Instructions to Bidders and in the General Conditions of Contract are the provisions of AFD's Standard Bidding Documents: Procurement of Works.
6. Bids must be delivered to the above office on or before 14:00 Hours IST on **2nd November 2022** and must be accompanied by Bid Security of INR 2.96 Million.
7. Bids will be opened in the presence of Bidders' representatives who choose to attend at 14:15 Hours IST on **2nd November 2022** at the same address.
8. **Qualification criteria:** Eligible bidders for AFD financed procurement, including all members of a Joint Venture, shall be from an eligible source country and shall satisfy mainly the qualifying criteria listed hereafter:

A) Technical:

- i) **General Construction Experience:** Experience under construction contracts shall be at least five (05) years, starting 1st January 2017.
- ii) **Specific Construction & Contract Management Experience:** Two (2) numbers of similar¹ contracts, each of minimum value of INR 140 million, have been satisfactorily and substantially² completed in the period between 1st January 2017 and application submission deadline.
- iii) **Specific Experience:** minimum experience in the following key activities successfully completed in the period between 1st January 2017 and application submission deadline:
 - a) RCC Piling works
 - b) Fire Fighting system works

B) Financial:

- i) **Minimum Annual Turnover:** Minimum average annual turnover of INR 150 million for the last 3 years (2020-21; 2019-20 & 2018-19).
- ii) Demonstrate the Minimum Liquidity of INR 2.5 million to meet the financial resources requirements for the subject contract(s) net of the Bidder's other commitments.
- iii) Demonstrate Current soundness of the Bidder's financial position³:
 - a) Average earnings before interest, taxes, depreciation, and amortization (EBITDA) for the last three (3) years > 0;
 - b) Total equity (net worth) for the last three (3) years > 0;
 - c) Average liquidity ratio for the last three (3) years > 1;
 - d) Average indebtedness ratio for the last three (3) years < 6

C) Environmental, Social, Health and Safety (ESHS):

- i) Availability of a valid ISO certification or internationally recognized equivalent for:
 - a) Quality management certificate (ISO 9001),

¹ The similarity shall be based on execution of any civil works for buildings including site development, piling, RCC building construction, electrification, fire fighting system, etc. which sufficiently demonstrate the bidder's capability to provide the intended services under this Bid.

² Substantial completion shall be based on 80% or more works completed under the contract.

³ The Bidder's financial position will be deemed sound if at least two (2) of the four (4) criteria are met.

- b) Environmental management certificate (ISO 14001)
- c) Health and safety management certificate ISO 45001.
- ii) Experience of two (2) contracts over the last 5 (five) years, where ESHS (Environment, Social, Health & Safety) measures were carried out or are in-progress satisfactorily.

D) Legal and others:

- i) **History of Non-Performing Contracts:** Termination of a contract did not occur as a result of Bidder's default in the past five (5) years.
- ii) **Pending Litigation:** All pending litigation shall in total not represent more than one hundred percent (100%) of the Bidder's net worth.

Sd/-
Project Director
PMU, APFBC Society

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PART 1- Bidding Procedures

Section I - Instructions to Bidders

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A. General

- 1 Scope of Bid**

 - 1.1 In connection with the Invitation for Bids specified in the Bid Data Sheet (BDS), the Employer, as specified in the BDS, issues these Bidding Documents for the procurement of Works as specified in Section VII - Works Requirements. The name, identification, and number of lots (contracts) of this International Procurement Competition (IPC) process are specified in the BDS.
 - 1.2 Throughout these Bidding Documents:

 - 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 Employer **specified in the BDS** has received financing (hereinafter called "funds") from *Agence Française de Développement* (hereinafter called "**AFD**") through Government of Indiatoward the project named **in the BDS**. The Employer intends to apply a portion of the funds to eligible payments under the contract(s) for which these Bidding Documents are issued.
- 3 Corrupt and Fraudulent Practices**

 - 3.1 AFD requires compliance with its policy regarding corrupt and fraudulent practices as set forth in Section VI - AFD Policy - Corrupt and Fraudulent Practices - Environmental and Social Responsibility.
 - 3.2 In further pursuance of this policy, Bidders shall permit and shall cause its subcontractors and subconsultants, to permit AFD to inspect all accounts, records and other documents relating to any prequalification process, Bid submission, and contract performance (in the case of award), and to have them audited by auditors appointed by AFD.
- 4 Eligible Bidders**

 - 4.1 A Bidder may be a firm that is a private entity, a State-owned entity - subject to ITB 4.3 - or any combination of such entities in the form of a joint venture (JV) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent. In the case of a joint venture, all members shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms. The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the bidding process and, in the event the JV is awarded the Contract, during contract execution. **Unless specified in the BDS**, there is no limit on the number of members in a JV.
 - 4.2 A Bidder shall not have a conflict of interest. Any Bidder found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest for the purpose of this procurement process, if the Bidder:

 - a) Directly or indirectly controls, is controlled by or is under common control with another Bidder; or
 - b) Receives or has received any direct or indirect subsidy from another Bidder; or
 - c) Has the same legal representative as another Bidder; or
 - d) Has a relationship with another Bidder, directly or through common third parties, that puts it in a position to influence the Bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or
 - e) Participates in more than one Bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all Bids in which such Bidder is involved. However, this does not limit the inclusion of the same subcontractor in more than one Bid; or
 - f) Has (or any of its affiliates has) 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) Has been hired, or is proposed to be hired (or any of its affiliates has been hired, or is proposed to be hired) by the Employer as Engineer for the Contract implementation; or
 - h) Has a close business or family relationship with a professional staff of the

Employer (or of the project implementing agency, or of a recipient of a part of the funds) who: (i) are directly or indirectly involved in the preparation of the Bidding Documents or specifications of the contract, and/or the Bid evaluation process of such contract; or (ii) would be involved in the implementation or supervision of such contract unless the conflict stemming from such relationship has been resolved in a manner acceptable to AFD throughout the procurement process and execution of the contract.

- 4.3 AFD's eligibility criteria to Bid are described in Section V - Eligibility Criteria.
- 4.4 A Bidder shall not be under suspension from bidding by the Employer as the result of the execution of a Bid-Securing Declaration.
- 4.5 This Bidding is open only to prequalified Bidders unless **specified in the BDS**.
- 4.6 A Bidder shall provide such evidence of eligibility satisfactory to the Employer, as the Employer shall reasonably request.

5 Eligible Materials, Equipment and Services

- 5.1 The materials, equipment and services to be supplied under the Contract and financed by AFD may have their origin in any country subject to the restrictions specified in Section V - Eligibility Criteria, and all expenditures under the Contract will not contravene such restrictions. At the Employer's request, Bidders may be required to provide evidence of the origin of materials, equipment and services.

B. Contents of Bidding Documents

6 Sections of Bidding Documents

- 6.1 The Bidding Documents consist of Parts 1, 2, and 3, which include all the Sections specified below, and which should be read in conjunction with any Addenda issued in accordance with ITB 8.

PART 1: Bidding Procedures

- Section I - Instructions to Bidders (ITB)
- Section II – Bid Data Sheet (BDS)
- Section III - Evaluation and Qualification Criteria
- Section IV – Bidding Forms
- Section V – Eligibility Criteria
- Section VI - AFD Policy – Corrupt and Fraudulent Practices – Environmental and Social Responsibility

PART 2: Works Requirements

- Section VII – Works Requirements

PART 3: Conditions of Contract and Contract Forms

- Section VIII – General Conditions (GC)
- Section IX – Particular Conditions (PC)
- Section X – Contract Forms

- 6.2 The Invitation for Bids issued by the Employer is not part of the Bidding Documents.
- 6.3 Unless obtained directly from the Employer, the Employer is not responsible for the completeness of the Bidding Documents, responses to requests for clarification, the minutes of the pre-Bid meeting (if any), or amendments to the Bidding Documents in accordance with ITB 8. In case of any contradiction, documents obtained directly from the Employer shall prevail.
- 6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Documents and to furnish with its Bid all information and documentation as is required by the Bidding Documents.

7 Clarification of Bidding Documents, Site Visit, Pre-Bid Meeting

- 7.1 A Bidder requiring any clarification of the Bidding Documents shall contact the Employer in writing at the Employer's address specified in the BDS or raise its enquiries 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 no later than fourteen (14) days prior to the deadline for submission of Bids. The Employer shall forward copies of its response to all Bidders who have acquired the Bidding Documents in accordance with ITB 6.3, including a description of the inquiry but without

identifying its source. If so specified in the BDS, the Employer shall also promptly publish its response at the web page identified in the BDS. Should the clarification result in changes to the essential elements of the Bidding Documents, the Employer shall amend the Bidding Documents 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 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 upon 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 If so specified in the BDS, the Bidder's designated representative is invited to attend a pre-Bid meeting. 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, as far as possible, to submit any questions in writing, to reach the Employer not later than one week before the meeting.
- 7.6 Minutes of the pre-Bid meeting, if applicable, including the text of the questions asked by Bidders, 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 Documents in accordance with ITB 6.3. Any modification to the Bidding Documents 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. Non-attendance at the pre-Bid meeting will not be a cause for disqualification of a Bidder.

8 Amendment of Bidding Documents

- 8.1 At any time prior to the deadline for submission of Bids, the Employer may amend the Bidding Documents by issuing amendments.
- 8.2 Any amendment issued shall be part of the Bidding Documents and shall be communicated in writing to all who have obtained the Bidding Documents from the Employer in accordance with ITB 6.3. The Employer shall also promptly publish the amendment on the Employer's web page in accordance with ITB 7.1.
- 8.3 To give Bidders reasonable time in which to take an amendment 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 not 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 Comprising the Bid

- 11.1 The Bid shall comprise the following:
 - a) Letter of Bid and the Bidding Forms in accordance with ITB 12;
 - b) Completed schedules as required, including Price Schedules, in accordance with ITB 12 and 14 and as indicated in the BDS;
 - c) Bid Security or Bid-Securing Declaration, in accordance with ITB 19.1;
 - d) Alternative Bids, if permissible in accordance with ITB 13;
 - e) Written confirmation authorizing the signatory of the Bid to commit the

- Bidder, in accordance with ITB 20.2;
- f) Statement of Integrity, Eligibility and Social and Environmental Responsibility duly signed, in accordance with ITB 12;
 - g) Documentary evidence in accordance with ITB 17 establishing the Bidder's continued qualified status or, if post-qualification applies, as specified in accordance with ITB 4.5, the Bidder's qualifications to perform the contract if its Bid is accepted;
 - h) Technical Proposal in accordance with ITB 16;
 - i) Any other document **required in the BDS**.
- 11.2 In addition to the requirements under ITB 11.1, Bids submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all members. Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful Bid shall be signed by all members and submitted with the Bid, together with a copy of the proposed Agreement.
- 11.3 The Bidder shall furnish information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Bid.
- 12 Letter of Bid, Statement of Integrity, Bidding Forms and Schedules**
- 12.1 The Letter of Bid, the Statement of Integrity, the Bidding Forms and Schedules, including the Bill of Quantities for unit price contracts or the Schedule of Prices in case of lump sum contracts, shall be prepared using the relevant forms furnished in Section IV - Bidding Forms. The Letter of Bid and the Statement of Integrity must be completed without any alterations to the text, and no substitutes shall be accepted except as provided under ITB 20.4. All blank spaces shall be filled in with the information requested.
- 13 Alternative Bids, Alternative Technical Solutions and Alternative Times for Completion of the Works**
- 13.1 **Unless otherwise specified in the BDS**, alternative Bids shall not be considered. If permitted, the method for their evaluation shall be described in Section III - Evaluation and Qualification Criteria.
- 13.2 **Unless otherwise specified in the BDS**, alternative technical solutions shall not be considered. If Bidders are permitted to submit alternative technical solutions and only for specified parts of the Works, such parts shall be identified in Section VII - Works Requirements. The methods for their evaluation shall be described in Section III - Evaluation and Qualification Criteria.
- 13.3 Bidders wishing to submit alternatives, if permitted under ITB 13.1 and/or ITB 13.2, shall provide all information necessary for a complete evaluation by the Employer, including but not limited to, drawings, design calculations, technical specifications, breakdown of prices, proposed construction methodology, evidence of meeting the qualification criteria, the benefits to the employer for selecting the alternative Bid and/or alternative technical solution and other relevant details.
- 13.4 Only one (1) alternative Bid per Bidder may be submitted and only one (1) alternative technical solution for each permitted part of the Works may be submitted.
- 13.5 **Unless otherwise specified in the BDS**, alternative times for completion of the Works shall not be considered. If permitted the method for their evaluation shall be described in Section III - Evaluation and Qualification Criteria.
- 14 Bid Prices and Discounts**
- 14.1 The prices and discounts quoted by the Bidder in the Letter of 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 price(s) for all items of the Works, as identified in Section IV - 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 shall be deemed covered by the rates for other items in the Bill of Quantities and will not be paid for separately by the Employer. An item not listed in the priced Bill of Quantities shall be assumed to be not included in the Bid, and provided that the Bid is determined substantially responsive notwithstanding this omission, the highest price of the item quoted by substantially responsive Bidders will be added to the Bid price and the equivalent total cost of the Bid so determined will be used for price comparison.
- 14.3 The price to be quoted in the Letter of Bid shall be the total price of the Bid,

excluding any discounts offered.

- 14.4 The Bidder shall quote any discounts and the methodology for their application in the Letter of Bid.
- 14.5 **Unless otherwise specified in the BDS** and the Contract, the rate(s) and price(s) quoted by the Bidder are subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract. In such a case, the Bidder shall furnish the indices and weightings for the price adjustment formulae in the Schedule of Adjustment Data and the Employer may require the Bidder to justify its proposed indices and weightings.
- 14.6 If so specified in ITB 1.1, Bids are being invited for individual lots (contracts) or for any combination of lots (packages). Bidders wishing to offer discounts 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. Discounts shall be submitted in accordance with ITB 14.4, provided the Bids for all lots (contracts) are opened at the same time.
- 14.7 **Unless otherwise specified in the BDS**, 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.
- 15 Currencies of Bid and Payment**
- 15.1 The currency(ies) of the Bid and the currency(ies) of payments 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 Schedule of Adjustment Data in the Appendix to Bid are reasonable, in which case a detailed breakdown of the foreign currency requirements shall be provided by Bidders.
- 16 Documents Comprising the Technical Proposal**
- 16.1 The Bidder shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, Schedules and any other information as stipulated in Section IV - Bidding Forms, in sufficient detail to demonstrate the adequacy of the Bidder's proposal to meet the Work requirements and the completion time.
- 17 Documents Establishing the Qualifications of the Bidder**
- 17.1 In accordance with Section III - Evaluation and Qualification Criteria, to establish that the Bidder continues to meet the criteria used at the time of prequalification, the Bidder shall provide in the corresponding information sheets included in Section IV - Bidding Forms, updated information on any assessed aspect that changed from that time, or if post-qualification applies as specified in ITB 4.5, the Bidder shall provide the information requested in the corresponding information sheets included in Section IV - Bidding Forms.
- 17.2 If a margin of preference applies as specified in accordance with ITB 33.1, domestic Bidders, individually or in joint ventures, applying for eligibility for domestic preference shall supply all information required to satisfy the criteria for eligibility specified in accordance with ITB 33.1.
- 17.3 Any change in the structure or formation of a Bidder after being prequalified and invited to Bid (including, in the case of a JV, any change in the structure or formation of any member thereto) shall be subject to the written approval of the Employer prior to the deadline for submission of Bids. Such approval shall be denied if (i) as a consequence of the change, the Bidder no longer substantially meets the qualification criteria set forth in Section III - Evaluation and Qualification Criteria; or (ii) in the opinion of the Employer, the change may result in a substantial reduction in competition. Any such change should be submitted to the Employer not later than fourteen (14) days after the date of the Invitation for Bids.
- 18 Period of Validity of Bids**
- 18.1 Bids shall remain valid for the period **specified in the BDS** after the Bid submission deadline date prescribed by the Employer in accordance with ITB 22.1. A Bid valid for a shorter period shall be rejected by the Employer as non-responsive.
- 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 for twenty-eight

(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, except as provided in ITB 18.3.

18.3 If the award is delayed by a period exceeding fifty-six (56) days beyond the expiry of the initial Bid validity, the Contract price shall be determined as follows:

- a) In the case of fixed price contracts, the Contract price shall be the Bid price adjusted by the factor specified in the BDS;
- b) In the case of adjustable price contracts, no adjustment shall be made;
- c) In any case, Bid evaluation shall be based on the Bid price without taking into consideration the applicable correction from those indicated above.

19 Bid Security

19.1 The Bidder shall furnish as part of its Bid, either a Bid-Securing Declaration or a Bid Security **as specified in the BDS**, in original form and, in the case of a Bid Security, in the amount and currency **specified in the BDS**.

19.2 A Bid-Securing Declaration shall use the form included in Section IV - Bidding Forms.

19.3 If a Bid Security is specified pursuant to ITB 19.1, the Bid Security shall be a demand guarantee in any of the following forms at the Bidder's option:

- a) An unconditional guarantee issued by a bank or financial institution (such as an insurance, bonding or surety company);
- b) An irrevocable letter of credit;
- c) A cashier's or certified check; or
- d) Another security specified in the BDS;

from a reputable source from an eligible country as specified in Section V - Eligibility Criteria. If the unconditional guarantee is issued by a financial institution located outside the Employer's Country, the issuing financial institution shall have a correspondent financial institution located in the Employer's Country to make it enforceable. In the case of a bank guarantee, the Bid security shall be submitted either using the Bid Security Form included in Section IV - Bidding Forms, or in another substantially similar format approved by the Employer prior to Bid submission. The Bid Security shall be valid for twenty-eight (28) days beyond the original validity period of the Bid, or beyond any period of extension if requested under ITB 18.2.

19.4 Any Bid not accompanied by a substantially responsive Bid Security or Bid-Securing Declaration shall be rejected by the Employer as non-responsive.

19.5 The Bid Security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's signing the Contract and furnishing the Performance Security pursuant to ITB 42.

19.6 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 Letter of Bid, or any extension thereto provided by the Bidder; or
- b) If the successful Bidder fails to:
 - (i) Sign the Contract in accordance with ITB 41; or
 - (ii) Furnish a Performance Security in accordance with ITB 42.

19.8 The Bid Security or the Bid-Securing Declaration of a JV shall be in the name of the JV that submits the Bid. If the JV has not been legally constituted into a legally enforceable JV at the time of Bidding, the Bid Security or the Bid-Securing Declaration shall be in the names of all future members as named in the letter of intent referred to in ITB 4.1 and ITB 11.2.

19.9 If a Bid Security is **not required in the BDS** pursuant to ITB 19.1, and

- a) If a Bidder withdraws its Bid during the period of Bid validity specified by the Bidder on the Letter of Bid or any extension thereto provided by the

Bidder, or

- b) If the successful Bidder fails to sign the Contract in accordance with ITB 41; or furnish a Performance Security in accordance with ITB 42;

the Employer may, **if provided for in the BDS**, declare the Bidder ineligible to be awarded a contract by the Employer for a period of time **as stated in the BDS**.

20 Format and Signing of Bid

- 20.1 The Bidder shall prepare one original of the documents comprising the Bid as described in ITB 11 and clearly mark it "ORIGINAL". 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 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 where entries or amendments have been made shall be signed or initialed by the person signing the Bid.
- 20.3 In case the Bidder is a JV, the Bid shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives. If the JV has not been legally constituted into a legally enforceable JV at the time of Bidding, then the Bid shall be signed by every member of the proposed JV.
- 20.4 Any inter-lineation, 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 The Bidder shall enclose the original and all copies of the Bid, including alternative Bids, if permitted in accordance with ITB 13, in separate sealed envelopes, duly marking the envelopes as "ORIGINAL", "ALTERNATIVE" and "COPY". These envelopes containing the original and the copies shall then be enclosed in one single envelope.
- 21.2 The inner and outer envelopes shall:
- a) Bear the name and address of the Bidder;
 - b) Be addressed to the Employer in accordance with ITB 22.1;
 - c) Bear the specific identification of this bidding process in accordance with ITB 1.1; and
 - d) Bear a warning not to open before the time and date for Bid opening.

- 21.3 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 **specified in the BDS**. **When so specified in the BDS**, Bidders shall have the option of submitting their Bids electronically. Bidders submitting Bids electronically shall follow the electronic Bid submission procedures **specified in the BDS**.
- 22.2 The Employer may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Documents 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 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. 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 withdrawals 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 Letter of Bid or any extension thereof.

25 Bid Opening

25.1 Except in the cases specified in ITB 23 and 24, the Employer shall publicly open and read out in accordance with ITB 25 all Bids received by the deadline (regardless of the number of Bids received), at the date, time and place **specified in the BDS**, in public and 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 22.1, shall be **as specified in the BDS**.

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. Next, envelopes marked "SUBSTITUTION" shall be opened and read out and exchanged with the corresponding Bid being substituted, and the substituted Bid shall not be opened, but returned to the Bidder. No Bid substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at Bid opening. Envelopes marked "MODIFICATION" shall be opened and read out with the corresponding Bid. No Bid modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at Bid opening. Only Bids that are opened and read out at Bid opening shall be considered further.

25.3 All other envelopes shall be opened one at a time, reading out: the name of the Bidder and whether there is a modification; the total Bid Price, per lot (contract) if applicable, including any discounts and alternative Bids; the presence or absence of a Bid security or Bid-securing declaration, if required; and any other details as the Employer may consider appropriate. Only discounts and alternative Bids read out at Bid opening shall be considered for evaluation. The Letter of Bid and the Schedules are to be initialed by a minimum of three representatives of the Employer attending Bid opening. At Bid opening, the Employer shall neither discuss the merits of any Bid nor reject any Bid (except for late Bids, in accordance with ITB 23.1).

25.4 The Employer shall prepare a record of the Bid opening that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification; the Bid Price, per lot (contract) if applicable, including any discounts and alternative Bids; and the presence or absence of a Bid security or 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.

E. Evaluation and Comparison of Bids

26 Confidentiality

26.1 Information relating to the examination, evaluation, and comparison of the Bids, and qualification of the Bidders and recommendation of contract award shall not be disclosed to Bidders or any other persons not officially concerned with the bidding process until information on Contract award is communicated to all Bidders in accordance with ITB 40.

26.2 Any attempt by a Bidder to influence the Employer in the examination, evaluation, and comparison of the Bids, and qualification of the Bidders, 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 a Bidder wishes to contact the Employer on any matter related to the bidding process, it shall do so in writing.
- 27 Clarification of Bids**
- 27.1 To assist in the examination, evaluation, and comparison of the Bids, and qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its Bid, given a reasonable time for a response. 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, including any voluntary increase or decrease, in the prices or substance of the Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids, in accordance with ITB 31.
- 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 Documents;
 - b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Documents; and
 - c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Documents.
- 29 Determination of Responsiveness**
- 29.1 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.
- 29.2 A substantially responsive Bid is one that meets the requirements of the Bidding Documents 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 Documents, 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 Bid.
- 29.3 The Employer shall examine the technical aspects of the Bid submitted in accordance with ITB 16, in particular, to confirm that all requirements of Section VII - Works Requirements have been met without any material deviation, reservation or omission.
- 29.4 If a Bid is not substantially responsive to the requirements of the Bidding Documents, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.
- 30 Non-material Non-conformities**
- 30.1 Provided that a Bid is substantially responsive, the Employer may waive any non-material non-conformity in the Bid.
- 30.2 Provided that a 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 non-material non-conformities in the Bid related to documentation requirements. Requesting information or documentation on such non-conformities shall not be related to any aspect of the price of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.
- 30.3 Only for admeasurement contracts and provided that a Bid is substantially responsive, the Employer shall rectify quantifiable non-material non-conformities 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.
- 31 Correction of**
- 31.1 Provided that the Bid is substantially responsive, the Employer shall correct

Arithmetical Errors

arithmetical errors on the following basis:

- a) Only for admeasurement 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) Only for admeasurement contracts, if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
- c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless, only for admeasurement contracts, the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

31.2 Bidders shall be requested to accept correction of arithmetical errors. Failure to accept the correction in accordance with ITB 31.1 shall result in the rejection of the Bid.

32 Conversion to Single Currency

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

33 Margin of preference

33.1 **Unless otherwise specified in the BDS**, a margin of preference for domestic Bidders shall not apply.

34 Subcontractors

34.1 **Unless otherwise stated in the BDS**, the Employer does not intend to execute any specific elements of the Works by subcontractors selected in advance by the Employer (nominated subcontractors).

34.2 A "specialized subcontractor" is a subcontractor hired for specialized work as defined by the Employer in Section III - 4.2 Experience. If no specialized work is specified by the Employer as such, subcontractors experience shall not be considered for Bids evaluation.

34.3 In case of Pre-qualification, the Bidder's Bid shall name the same specialized subcontractor as submitted in the prequalification application and approved by the Employer, or may name another specialized subcontractor meeting the requirements specified in the prequalification phase.

34.4 In case of Post-qualification, the Employer may permit subcontracting for certain specialized works as indicated in Section III - 4.2 Experience. When sub-contracting is permitted by the Employer, the specialized subcontractor's experience shall be considered for the evaluation. Section III - Evaluation and Qualification Criteria, describes the qualification criteria for subcontractors.

35 Evaluation of Bids

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

35.2 To evaluate a Bid, the Employer shall consider the following:

- a) The Bid price, excluding Provisional Sums unless priced competitively and the provision, if any, for contingencies in the Schedules, but including Daywork items, where priced competitively;
- b) Price adjustment for correction of arithmetic errors in accordance with ITB 31.1;
- c) Price adjustment due to missing items, missing rates, or discounts offered in accordance with ITB 14.2 and 14.4;
- d) Price adjustment due to quantifiable non-material non-conformities in accordance with ITB 30.3;
- e) Converting the amount resulting from applying (a) to (d) above, if relevant, to a single currency in accordance with ITB 32;
- f) The additional evaluation factors as specified in Section III - Evaluation and Qualification Criteria.

35.3 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.

35.4 If these Bidding Documents allows Bidders to quote separate prices for different lots (contracts), the methodology to determine the lowest evaluated price of the

lot (contract) combinations, including any discounts offered in the Letter of Bid, is specified in Section III - Evaluation and Qualification Criteria.

- 35.5 If the Bid is seriously unbalanced or front loaded in the opinion of the Employer and 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.
- 35.6 Only the qualifications of the Bidder shall be considered. In particular, the qualifications of a parent or other affiliated company that is not party to the Bidder under a JV in accordance with ITB 4.1 shall not be considered.
- 35.7 In case of multiple contracts, Bidders should indicate in their Bids the individual contracts in which they are interested. The Employer shall qualify each Bidder for the maximum combination of contracts for which the Bidder has thereby indicated its interest and for which the Bidder meets the appropriate aggregate requirements. The Qualification Criteria and Requirements are mentioned in Section III - Evaluation and Qualification Criteria.

36 Abnormally low Bid

- 36.1 If the Bid, which results in the lowest Evaluated Bid Price, is twenty per cent (20%) or more, lower than the Employer's estimate, and unless the Employer provides justification that the estimate is inaccurate, the Employer shall require the Bidder to produce detailed price analyses for any or all items of the Schedules, to demonstrate the internal consistency of those prices and priced quantities with the construction methods, resources and schedule proposed, as well as the Works Requirements. Notwithstanding the provisions of ITB 14.2 which shall not be applicable, if one or several inconsistencies are evidenced, the Bid shall be declared non-compliant and rejected.

37 Qualification of the Bidder

- 37.1 Any change in the structure or formation of a Bidder after being prequalified and invited to bid (including, in the case of a JV, any change in the structure or formation of any member thereto) shall be subject to the written approval of the Employer. Such approval shall be denied if (i) as a consequence of the change, the Bidder no longer substantially meets the prequalification criteria; or (ii) in the opinion of the Employer, the change may result in a substantial reduction in competition. Any such change should be submitted to the Employer not later than fourteen (14) days after the date of the Invitation for Bids.
- 37.2 The Employer shall determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated and substantially responsive Bid either continues to meet (if prequalification applies) or meets (if post-qualification applies) the qualifying criteria specified in Section III - Evaluation and Qualification Criteria.
- 37.3 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.
- 37.4 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the Bid, in which event the Employer shall proceed to the next lowest evaluated Bid to make a similar determination of that Bidder's qualifications to perform satisfactorily.

38 Employer's Right to Reject all Bids

- 38.1 The Employer reserves the right 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 compare the evaluated prices of all substantially responsive Bids established in accordance with ITB 35.2 to determine the lowest evaluated Bid.
- 39.2 Subject to ITB 38.1, the Employer shall award the Contract to the Bidder whose Bid has been determined to be the lowest evaluated Bid and is substantially responsive to the Bidding Documents, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.

40 Notification of

- 40.1 Prior to the expiration of the period of Bid validity, the Employer shall notify the

Award

successful Bidder, in writing, that its Bid has been accepted. The notification letter (hereinafter and in the Conditions of Contract and Contract Forms called the "Letter of Acceptance") shall specify the sum that the Employer will pay the Contractor in consideration of the execution and completion of the Works and the requirement for the Contractor to remedy any defects therein (hereinafter and in the Conditions of Contract and Contract Forms called the "Accepted Contract Amount"). At the same time, the Employer shall also notify all other Bidders of the results of the Bidding.

- 40.2 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.
- 40.3 The Employer shall promptly respond in writing to any unsuccessful Bidder who, after notification of award in accordance with ITB 40.1, requests in writing the grounds on which its Bid was not selected.
- 40.4 In exceptional circumstances, a contract negotiation may be needed. In such case, the Employer shall send to the successful Bidder a letter of invitation to negotiate which should not be mistaken as a Letter of Acceptance which, under FIDIC Conditions of Contract, triggers contractual obligations from both Parties. The Letter of Acceptance shall be sent once the contract negotiation ends successfully. Minutes of negotiation meetings, and agreements reached therein, shall be attached to the Letter of Acceptance.

41 Signing of Contract

- 41.1 Promptly upon notification, the Employer shall send the successful Bidder the Contract Agreement.
- 41.2 Within twenty-eight (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 twenty-eight (28) days of the receipt of notification of award from the Employer, the successful Bidder shall furnish the performance security in accordance with the General Conditions of Contract, subject to ITB 36, using for that purpose the Performance Security Form included in Section X - Contract Forms, or another form acceptable to the Employer. If the performance security furnished by the successful Bidder is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Bidder to be acceptable to the Employer. A foreign institution providing a bond shall have a correspondent financial institution located in the Employer's Country.
- 42.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract 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 II-Bid Data Sheet

A. Introduction	
ITB 1.1	The number of the Invitation for Bids is: APFBC/PMU/Phase-II/AB/2022/245/10
ITB 1.1	The Employer is: Assam Project on Forest and Biodiversity Conservation Society (APFBCS), represented by the Project Director, PMU, APFBCS.
ITB 1.1	The name of the IPC is: Construction of Aranya Bhawan Annex Building at Panjabari, Guwahati. The identification number of the NPC is: APFBC/PMU/Phase-II/AB/2022/245/10
ITB 1.1 Additional Para	A complete set of Bidding Documents may be purchased by interested Bidders on the submission of a written application to the above and upon payment of a non-refundable fee of INR 5,900/- (Fee INR 5,000/- plus GST INR 900/-) only in the form of Demand Draft in favour of the Assam Project on Forest and Biodiversity Conservation Society Phase II payable at Guwahati, Assam. Bidding Documents may also be downloaded free of cost from the website of APFBCS viz. www.apfbcn.in . In case the Bidding Documents are downloaded from website, then non-refundable fee is not required.
ITB 2.1	The name of the Project is: Assam Project on Forest and Biodiversity Conservation- Phase II.
ITB 4.1	Maximum number of members in the JV shall be: 2 (two) Nos.
ITB 4.5	This bidding process is not subject to prequalification.
B. Bidding Documents	
ITB 7.1	Clarifications may be requested no later than 3rd October 2022. The contact information for requesting clarifications is: Attention: Project Director, PMU, APFBC Society Address: Aranya Bhawan, Panjabari, Guwahati – 781037 (Assam) Telephone: +91-361-2733917. Electronic mail address: pd@apfbcn.in .
ITB 7.4	A Pre-Bid meeting shall take place at the following date, time and place: Date: 26th September 2022. Time: 11:30 Hours IST Place: Aranya Bhawan, Panjabari, Guwahati – 781037 (Assam) A Site visit conducted by the Employer shall be organized.
C. Preparation of Bids	
ITB 10.1	The language of the Bid is: English All correspondence exchange shall be in the English language. Language for translation of supporting documents and printed literature is English.
ITB 11.1(b)	The following schedules shall be submitted with the Bid: PRICE SCHEDULE (Bill of Quantities)
ITB 11.1(i)	The Bidder shall submit with its Bid the following additional documents: Not Applicable
ITB 13.1	Alternative Bids shall not be permitted.
ITB 13.2	Alternative technical solutions shall not be permitted for the parts of the Works specified in Section VII – Works Requirements.
ITB 13.5	Alternative times for completion of the Works shall not be permitted. If alternatives are allowed, the Bid adjustment amount for the evaluation will be: Not Applicable
ITB 14.5	The prices quoted by the Bidder shall be: Fixed
ITB 14.7	The Bidder shall identify in the Bid Price, as a separate amount, the GST payable under the Contract. Other taxes, duties and fees shall be deemed included in the Contract prices. Taxes, duties and fees exemptions, to which payments under the Contract are entitled, are specified in clause 14.1 (b) of the General Conditions of Contract.
ITB 15.1	The currency(ies) of the Bid and the payment currency(ies) shall be in accordance with Option - A as described below:

	<p>Option A (Bidders to quote entirely in local currency and no import input is required in the Works):</p> <p>a) The unit rates and the prices shall be quoted by the Bidder in the Schedules, entirely in Indian Rupee (INR), the name of the currency of the Employer's country, and further referred to as "the local currency". A Bidder expecting to incur expenditures in other currencies for inputs to the Works supplied from outside the Employer's country (referred to as "the foreign currency") shall indicate in the Appendix to Bid, the percentage(s) of the Bid Price (excluding Provisional Sums), needed by the Bidder for the payment of such foreign currency requirements, limited to Euros (€) or US Dollars (US\$);</p> <p>b) The rates of exchange to be used by the Bidder in arriving at the local currency equivalent and the percentage(s) mentioned in (a) above shall be specified by the Bidder in the Appendix to Bid, and shall apply for all payments under the Contract so that no exchange risk will be borne by the successful Bidder.</p>
ITB 18.1	The Bid Validity Period shall be 120 days.
ITB 18.3(a)	The Bid Price shall be adjusted as will be indicated in the request for Bid validity extension.
ITB 19.1	A Bid Security shall be required. A Bid-Securing Declaration shall not be required. The amount and currency of the Bid security shall be INR 2.80 Million.
ITB 19.3(d)	Other types of acceptable securities: None
ITB 19.9	- Deleted -
ITB 20.1	In addition to the original of the Bid, the number of copies is: one (1) paper copy and one (1) digital copy (pen-drive).
ITB 20.2	The written confirmation of authorization to sign on behalf of the Bidder shall consist of: Power of Attorney established in the name of the signatory of the Bid.
D. Submission and Opening of Bids	
ITB 22.1	For Bid submission purposes only, the Employer's address is: Attention: Project Director, PMU, APFBC Society Address: Aranya Bhawan, Panjabari, Guwahati – 781037 (Assam) The deadline for Bid submission is: Date: 2nd November 2022. Time: 14:00 Hours IST Bidders shall not have the option of submitting their Bids electronically.
ITB 25.1	The Bid opening shall take place at: Address: Aranya Bhawan, Panjabari, Guwahati – 781037 (Assam) Date: 2nd November 2022. Time: 14:15 Hours IST No minimum number of Bids is required in order to proceed to Bid opening.
E. Evaluation and Comparison of Bids	
ITB 32.1	The currency that shall be used for Bid evaluation and comparison purposes to convert all Bid price(s) expressed in various currencies into a single currency is: Indian Rupee (INR) The source of exchange rate shall be: Reserve Bank of India The date for the exchange rate shall be seven (7) days prior to the date of deadline for Bid submission. The currency(ies) of the Bid shall be converted into a single currency in accordance with the procedure under Option – A as follows: Option A: Bidders quote entirely in local currency For comparison of Bids, the Bid Price, corrected pursuant to Clause 31, shall first be broken down into the respective amounts payable in various currencies by using the exchange rates specified by the Bidder in accordance with Sub-Clause 15.1. In the second step, the Employer will convert the amounts in various currencies in which the Bid Price is payable (excluding Provisional Sums but including Daywork where priced

	competitively) to the single currency identified above at the selling rates established for similar transactions by the authority specified and on the date stipulated above.
ITB 33.1	A margin of preference shall not apply
ITB 34.1	At this time the Employer <u>does not intends</u> to execute certain specific parts of the Works by subcontractors selected in advance (nominated subcontractors):
ITB 35.2	Evaluation of Bids will be done on the basis of prices excluding GST.
ITB 35.4	Financial letter of bid.
F. Award of Contract	
ITB 40.1	The publication of the contract award information will be published on www.apfbc.nic.in The publication will be done within 15 days after the contract signing.

Section III -Evaluation and Qualification Criteria

This Section contains all the criteria that the Employer shall use to evaluate Bids and qualify Bidders. In accordance with ITB 35, 36 and ITB 37, no other factors, methods or criteria shall be used. The Bidder shall provide all the information requested in the forms included in Section IV - Bidding Forms.

Wherever a Bidder is required to state a monetary amount, Bidders should indicate the Indian Rupee (INR) equivalent using the rate of exchange determined as follows:

- For construction turnover or financial data required for each year - Exchange rate prevailing on the last day of the respective calendar year;
- Value of single contract - Exchange rate prevailing on the date of the contract.

Exchange rates shall be taken from the publicly available source identified in the ITB 32.1. Any error in determining the exchange rates in the Bid may be corrected by the Employer.

1 Evaluation

In addition to the criteria listed in ITB 35.2 a) - e), the following criteria shall apply:

1.1 Assessment of adequacy of Technical Proposal with Requirements:

The assessment of the Technical Proposal submitted by a Bidder shall comprise (a) evaluation of the Bidder's technical capacity to mobilize key equipment and key personnel to carry out the Works, (b) construction method, (c) construction schedule and (d) sufficiently detailed supply sources, in accordance with requirements specified in Section VII - Works Requirements.

If the environmental and social risks are evaluated as high and/or impacts as significant, and therefore, the Bidding Documents include ESHS Specifications, then the Technical Proposal shall comprise an ESHS Methodology. The ESHS Methodology submitted by the Bidder shall be evaluated to determine whether it is substantially responsive (i.e. without material deviation, reservation or omission) to the requirements specified in Section VII - Works Requirements - ESHS Specifications. The Bidder shall use the ESHS Methodology Form provided for this purpose in Section IV - Bidding Forms - Technical Proposal. A Bid not comprising an ESHS Methodology or a Bid for which the ESHS Methodology is not substantially responsive (i.e. with material deviation, reservation or omission) shall be rejected.

1.2 Acceptability of the security methodology

When the security risks are assessed as high, and therefore, the Bidding Documents include security specifications in Section VII - Works Requirements, then the technical proposal shall comprise a security methodology, in accordance with ITB 11.1(i) of the Bid Data Sheet.

The security methodology shall be evaluated to determine whether each admissibility requirement specified in the security specifications is met. Otherwise, the Bid will be rejected.

1.3 Multiple Contracts, if permitted under ITB 35.4, will be evaluated as follow:

Award Criteria for Multiple Contracts (ITB 35.4):

1.4 Alternative Bids, if permitted under ITB 13.1, shall be evaluated as follows:

- a) The Alternative Bids shall be self-sufficient and independent from the Base Bid;
- b) Alternative Bids shall be compared against all other base and alternative Bids, to determine the lowest evaluated Bid that substantially complies with the requirements of the Bidding Documents for which the Bidder is considered qualified;
- c) Alternative Bids may be disregarded at the sole discretion of the Employer.

1.5 Alternative Technical Solutions, if permitted under ITB 13.2, shall be evaluated as follows:

- a) Only those Alternative Technical Solutions for parts of the Works permitted in Section VII - Works Requirements shall be evaluated;
- b) All Alternative Technical Solutions shall be compared against all base and alternative technical solutions;
- c) Alternative Technical Solutions may be disregarded at the sole discretion of the Employer.

1.6 Alternative Times for Completion of the Works, if permitted under ITB 13.5, shall be evaluated as follows:

- a) The requirements for Alternative Times for Completion of the Works shall be indicated in Section VII - Works Requirements;
- b) The Alternative Times for Completion of the Works shall be evaluated as follows: for every day of early completion and only for evaluation purposes, the Bid Price will be adjusted by subtracting the amount indicated under Sub-Clause 13.5 of the BDS.

1.7 **Personnel:**

The Bidder must demonstrate that it has the personnel for the key positions that meet the following requirements:

No.	Position	Total work experience (Minimum years)	In similar works experience (Minimum years)
1	Project Manager (PM): 1 No. Graduate/ Post Graduate in Civil Engineering with total 15 years' experience with at least 5 years experience in building construction.	15	10
2	Site Engineer – Civil (SE-C): 1 No. Graduate in Civil Engineering with total 10 years' experience with at least 5 years experience in building construction and quality control.	10	5
3	Environmental and Social Expert (ESP): 1 No. Graduate in any field with 10 years of experience in Environment/ Social with minimum 5 years of experience in similar work.	10	5
4	Health and Safety Expert (HSE): 1 No. Diploma/ Graduate in safety engineering field with 10 years of experience in Health/Safety with minimum 5 years of experience in similar work.	10	5
5	Site Engineer – Electrical (SE-E): 1 No. Diploma/Graduate in Electrical Engineering with total 10 years' experience with at least 5 years experience in building construction and quality control.	10	5
6	Supervisor: 3 Nos. HS in any field with 10 years of experience in supervising in construction works with minimum 5 years of experience in similar work.	10	5

The Bidder shall provide details of the proposed personnel and their experience records using Forms PER-1 and PER-2 included in Section IV - Bidding Forms.

1.8 **Equipment:**

The Bidder must demonstrate that it can obtain (purchase, lease or rent) the key equipment listed hereafter:

No.	Equipment Type and Characteristics	Minimum Number Required
1	Backhoe Loaders	2
2	Dumpers/Tippers	4
3	Dipper Shovel	1
4	Hydra Cranes	1
5	Batching Plant	1
6	Transit Mixer	1
7	Concrete Pump	1
8	Mixer Machine	6
9	Tractor Trolley	3

The Bidder shall provide further details of proposed items of equipment using Form EQU in Section IV - Bidding Forms.

2 **Domestic Preference: Not applicable**

3 **Qualification**

3.1 **Subcontractors:**

The general experience and financial resources of the subcontractors shall not be added to those of the Bidder for purposes of qualification of the Bidder.

3.2 **Update of Information in case of Prequalification: Not applicable**

3.3 **Qualification if no Prequalification has taken place:**

Following qualification criteria shall be fulfilled by the Bidder

Qualification Criteria

For multiple contracts, the criteria for qualification are aggregate minimum requirements of all the lots for which the Bidder submits a Bid, for criteria xxx, xxxx, xxxxxxxxxxxxxxxx.

1. Eligibility						
Criterion	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
			All Parties Combined	Each Member	One Member	
1.1 Nationality	Nationality in accordance with ITB 4.3	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Forms ELI-1.1 and ELI-1.2, with attachments
1.2 Conflict of Interest	No conflicts of interest in accordance with ITB 4.2	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Letter of Bid
1.3 AFD Eligibility	Not being ineligible to AFD financing, as described in ITB 4.3	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Statement of Integrity (appendix to Letter of Bid)
1.4 State-Owned Entity	Meet conditions of ITB 4.3	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Forms ELI-1.1 and ELI-1.2, with attachments

2. Historical Contract Non-Performance

Criterion	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
			All Parties Combined	Each Member	One Member	
2.1 History of Non-Performing Contracts	Termination of a contract ¹ did not occur as a result of Bidder's default in the past five (5) years.	Must meet requirement ² .	Must meet requirement	Must meet requirement ²	N/A	Form CON-2
2.2 Suspension Based on Execution of Bid Securing Declaration by the Employer	Not under suspension based on execution of a Bid Securing Declaration pursuant to ITB 4.4.	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Letter of Bid
2.3 Pending Litigation	All pending litigation shall in total not represent more than one hundred percent (100%) of the Bidder's net worth and shall be treated as resolved against the Bidder.	Must meet requirement	N/A	Must meet requirement	N/A	Form CON-2

¹ Non-performance shall include all terminations of contracts where (a) non-performance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) contracts that were so challenged but fully settled against the contractor. Non-performance shall not include contracts where Employers decision was overruled by the dispute resolution mechanism.

² This requirement also applies to contracts executed by the Bidder as JV member.

3. Financial Situation and Performance

Criterion	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
			All Parties Combined	Each Member	One Member	
3.1 Financial Capabilities	(i) The Bidder shall demonstrate that it has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction cash flow requirements minimum of INR 2.5 million for the subject contract(s) net of the Bidder's other commitments.	Must meet requirement	Must meet requirement	N/A	N/A	Forms FIN-3.1 and FIN-3.3
	(ii) The Bidder shall also demonstrate, to the satisfaction of the Employer, that it has adequate sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments	Must meet requirement	Must meet requirement	N/A	N/A	Forms FIN-3.3 and FIN-3.4
	(iii) The audited balance sheets or, if not required by the laws of the Bidder's country, other financial statements acceptable to the Employer, for the last three (3) years shall be submitted and must demonstrate the current soundness of the Bidder's financial position. The Bidder's financial position will be deemed sound if at least two (2) of the following four (4) criteria are met: a) Average earnings before interest, taxes, depreciation, and amortization (EBITDA) for the last three (3) years > 0; b) Total equity (net worth) for the last three (3) years > 0; c) Average liquidity ratio for the last three (3) years > 1 (Current assets / Current liabilities > 1); d) Average indebtedness ratio for the last three (3) years < 6 [(Total financial liabilities) / (EBITDA) < 6].	Must meet requirement	N/A	N/A	Leader must meet requirement	Form FIN-3.1, with attachments
3.2 Minimum Annual Turnover	Minimum average annual turnover for the last 3 years for each lot should be INR 150 million.	Must meet requirement	Must meet requirement	Must meet twenty five per cent (25%) of the requirement	Must meet sixty per cent (75%) of the requirement	Form FIN-3.2

4. Experience

Criterion	Requirements	Single Entity	Joint Venture (existing or intended)			Submission Requirements
			All Parties Combined	Each Member	One Member	
4.1 General Construction Experience	Experience under construction contracts in the role of prime contractor, JV member, subcontractor, or management contractor for at least the last five (05) years, starting 1st January 2017.	Must meet requirement	N/A	Must meet requirement	N/A	Form EXP-4.1
4.2 (a) Specific Construction & Contract Management Experience	A minimum number of similar ³ contracts specified below that have been satisfactorily and substantially ⁴ completed as a prime contractor, joint venture member ⁵ , management contractor or subcontractor between 1 st January 2017 and application submission deadline: two (2) contracts, each of minimum value of INR 140 million.	Must meet requirement	Must meet requirement ⁶	N/A	N/A	Form EXP-4.2(a)
4.2 (b) Specific Experience	For the above and/or any other contracts completed and under implementation as prime contractor, joint venture member, management contractor or subcontractor ⁷ on or after the first day of the calendar year during the period stipulated in 4.2 (a) above, a minimum construction experience in the following key activities successfully completed ⁸ : 1. RCC Piling works 2. Fire Fighting system works.	Must meet requirement	Must meet requirement	N/A	N/A	Form EXP-4.2(b)

³ The similarity shall be based on **execution of any civil works for buildings including site development, piling, RCC building construction, electrification, fire fighting system, etc. which sufficiently demonstrate the bidder's capability to provide the intended services under this Bid.** Adding up small value contracts (less than the value specified under requirement) to meet the overall requirement will not be accepted.

⁴ Substantial completion shall be based on 80% or more works completed under the contract.

⁵ For contracts under which the Bidder participated as a joint venture member or subcontractor, only the Bidder's share, by value, shall be considered to meet this requirement.

⁶ In the case of a JV, the value of contracts completed by its members shall not be aggregated to determine whether the requirement of the minimum value of a single contract has been met. For instance, if the criterion mentions "two (2) contracts with a minimum value of 50M\$ each", a JV composed of 3 members and having carried out four (4) contracts of 30M\$ each shall not be qualified. On the other hand, if 2 of the 3 members of the JV each carried out one (1) contract of 50M\$, the criterion is met, even if the third member does not have any contract of this value.

⁷ For contracts under which the Bidder participated as a joint venture member or subcontractor, only the Bidder's share shall be counted to meet this requirement.

⁸ For example, experience of works while in operation may be required under this criterion. Volume, number or rate of production of any key activity can be demonstrated in one or more contracts combined if executed during same time period, unless mentioned otherwise for the respective activities. The rate of production shall be the annual production rate for the key construction activity (or activities).

5. Environmental, Social, Health and Safety (ESHS)

Criterion	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
			All Parties Combined	Each Member	One Member	
5.1 ESHS Certification(s)	Availability of a valid ISO certification or internationally recognized equivalent (equivalency to be demonstrated by Bidder), and applicable to the worksite: <input checked="" type="checkbox"/> Quality management certificate ISO 9001 ⁹ ; <input checked="" type="checkbox"/> Environmental management certificate ISO 14001 ¹⁰ ; <input checked="" type="checkbox"/> Health and safety management certificate ISO 45001 ¹¹ .	Must meet requirement	N/A	N/A	Leader must meet requirement	Form CER Form CER Form CER
5.2 ESHS Documentation	Availability of in-house policies and procedures acceptable to the Employer for ESHS management: 1. Existence of official company procedures for the management of the following relevant points (Checked boxes): <input type="checkbox"/> ESHS resources and facilities and ESHS monitoring organization; <input checked="" type="checkbox"/> Project Areas management (base camps, quarries, borrow pits, storage areas); <input checked="" type="checkbox"/> Health & Safety on worksites; <input type="checkbox"/> Local recruitment and ESHS trainings of local staff (capacity building), ESHS trainings of subcontractors and local partners (transfer of knowledge); <input type="checkbox"/> Relations with stakeholders, information and consultation of local communities and authorities; <input type="checkbox"/> Traffic management; <input type="checkbox"/> Hazardous products; <input type="checkbox"/> Wastewater (effluents); <input checked="" type="checkbox"/> Protection of water resources; <input type="checkbox"/> Atmospheric emissions, noise and vibrations; <input type="checkbox"/> Waste management; <input type="checkbox"/> Biodiversity: protection of fauna and flora;	Must meet requirement	N/A	N/A	Leader must meet requirement	1. Official internal procedure documents (if any) or Bidders proposed plan on the topics indicated <input checked="" type="checkbox"/> must be provided.

⁹ [The ISO 9001 certification covers the principles of quality management, including a strong customer focus, motivation and commitment of management, process approach and continuous improvement. **This certification is to be required in case of complex organization of the worksite.**]

¹⁰ [The ISO 14001 certification defines the criteria for an environmental management system. **This certification is to be required in case of environmental issues of the worksite.**]

¹¹ [The ISO 45001 certification defines a management system for health and safety at work with the overall objective of preventing the occurrence of work related injuries and diseases among workers and providing safe and healthy workplaces. **This certification is to be required in case of health and safety issues.**]

5. Environmental, Social, Health and Safety (ESHS)

Criterion	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
			All Parties Combined	Each Member	One Member	
	<input type="checkbox"/> Site rehabilitation and revegetation; <input type="checkbox"/> Erosion and sedimentation; <input type="checkbox"/> Control of infectious and communicable diseases (HIV/AIDS, malaria, etc.).					
5.3 Similar Experience	Experience of two construction contracts over the last 5 (five) years, where major ESHS measures were carried out or are in-progress satisfactorily.	Must meet requirement	N/A	N/A	Leader must meet requirement	Form EXP-ESHS with supporting documents (the Bidder shall submit a piece of evidence supporting the ESHS implementation measures)
5.4 Specific ESHS Knowledge Transfer Experience	Experience of one (1) construction contract in developing and emerging countries over the last five (5) years in which the ESHS knowledge transfer to a local partner or the ESHS capacity building of the Employer's country staff was carried out satisfactorily	N/A	N/A	N/A	N/A	This requirement is not applicable for this bid and may be considered as DELETED
5.5 ESHS Dedicated Personnel	Availability of in-house personnel dedicated to ESHS issues: Environmental & Social Expert, and Health & Safety Expert indicated at Para 1.6 (Personnel) of Section III - Evaluation and Qualification Criteria	Must meet requirement	N/A	N/A	Leader must meet requirement	Forms PER-1 and PER-2

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Letter of Bid

[The Bidder shall prepare his Letter of Bid on a Letterhead paper specifying his name and address and include/submit the same in the Technical Bid in Envelope-1]

Date: _____

NPC No.: _____

Invitation for Bid No.: _____

Alternative No.: _____

To: Project Director, PMU, APFBC Society
Aranya Bhawan, Panjabari, Guwahati – 781037 (Assam)

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 have no conflict of interest in accordance with ITB 4.2;
- c) We have not been suspended nor declared ineligible by the Employer based on execution of a Bid Securing Declaration in the Employer's country in accordance with ITB 4.4;
- d) We offer to execute in conformity with the Bidding Documents the following works: Construction of Aranya Bhawan Annex at Panjabari, Guwahati.
- e) The total price of our Bid, excluding GST and excluding any discounts offered in item (f) below is:
 - i) Total price (excluding GST) of all items (sum of all items): *[Only indicate whether Quoted/Not Quoted, price not to be filled]*;
 - ii) The total amount of GST is: *[Only indicate whether Quoted/Not Quoted, price not to be filled]*;
- f) The discounts offered and the methodology for their application are:
 - i) The discounts offered are: *[Only indicate yes/ no]*;
 - ii) The exact method of calculations to determine the net price after application of discounts is shown below: *[price not to be filled]*.
- g) Our Bid shall be valid for a period of 120 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;
- h) If our Bid is accepted, we commit to obtain a performance security in accordance with ITB 43 of the Bidding Documents;
- i) We are not participating, as a Bidder, in more than one Bid in this bidding process in accordance with ITB 4.2(e), other than alternative Bids submitted in accordance with ITB 13;
- j) 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;
- k) We acknowledge and agree that the Employer reserves the right to annul the bidding process and reject all Bids at any time prior to contract award without thereby incurring any liability to us; and
- l) We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in any type of fraud and corruption.

Name of the Bidder¹: _____

Name of the person duly authorized to sign the Bid on behalf of the Bidder²: _____

Title of the person signing the Bid: _____

Signature of the person named above: _____

Date signed: _____ day of: _____

¹ In the case of the Bid submitted by a JV specify the name of the JV as Bidder.

² Person signing the Bid shall have the power of attorney given by the Bidder(s) and to be attached with the Bid.

Appendix 1 to Bid
Summary Schedule of Adjustment Data

-DELETED-

Appendix 2 to Bid

Summary of Payment Currencies

-DELETED-

Appendix 3 to Bid

Statement of Integrity, Eligibility and Environmental and Social Responsibility

Reference of the bid or proposal _____ (the "Contract")

To: **Project Director, PMU, APFBC Society, Aranya Bhawan, Panjabari, Guwahat- 781037** (the "Contracting Authority")

1. We recognize and accept that *Agence Française de Développement* ("AFD") only finances projects of the Contracting Authority subject to its own conditions which are set out in the Financing Agreement which benefits directly or indirectly to the Contracting Authority. As a matter of consequence, no legal relationship exists between AFD and our company, our joint venture or our suppliers, contractors, subcontractors, consultants or subconsultants. The Contracting Authority retains exclusive responsibility for the preparation and implementation of the procurement process and performance of the contract. The Contracting Authority means the Purchaser, the Employer, the Client, as the case may be, for the procurement of goods, works, plants, consulting services or non-consulting services.
2. We hereby certify that neither we nor any other member of our joint venture or any of our suppliers, contractors, subcontractors, consultants or subconsultants are in any of the following situations:
 - 2.1 Being bankrupt, wound up or ceasing our activities, having our activities administered by the courts, having entered into receivership, reorganization or being in any analogous situation arising from any similar procedure;
 - 2.2 Having been:
 - a) convicted, within the past five years by a court decision, which has the force of *res judicata* in the country where the Contract is implemented, of fraud, corruption or of any other offense committed during a procurement process or performance of a contract (in the event of such conviction, you may attach to this Statement of Integrity supporting information showing that this conviction is not relevant in the context of this Contract);
 - b) subject to an administrative sanction within the past five years by the European Union or by the competent authorities of the country where we are constituted, for fraud, corruption or for any other offense committed during a procurement process or performance of a contract (in the event of such sanction, you may attach to this Statement of Integrity supporting information showing that this sanction is not relevant in the context of this Contract);
 - c) convicted, within the past five years by a court decision, which has the force of *res judicata*, of fraud, corruption or of any other offense committed during the procurement process or performance of an AFD-financed contract;
 - 2.3 Being listed for financial sanctions by the United Nations, the European Union and/or France for the purposes of fight-against-terrorist financing or threat to international peace and security;
 - 2.4 Having been subject within the past five years to a contract termination fully settled against us for significant or persistent failure to comply with our contractual obligations during contract performance, unless this termination was challenged and dispute resolution is still pending or has not confirmed a full settlement against us;
 - 2.5 Not having fulfilled our fiscal obligations regarding payments of taxes in accordance with the legal provisions of either the country where we are constituted or the Contracting Authority's country;
 - 2.6 Being subject to an exclusion decision of the World Bank and being listed on the website <http://www.worldbank.org/debarr> (in the event of such exclusion, you may attach to this Statement of Integrity supporting information showing that this exclusion is not relevant in the context of this Contract);
 - 2.7 Having created false documents or committed misrepresentation in documentation requested by the Contracting Authority as part of the procurement process of this Contract.
3. We hereby certify that neither we, nor any of the members of our joint venture or any of our suppliers, contractors, subcontractors, consultants or subconsultants are in any of the following situations of conflict of interest:

- 3.1 Being an affiliate controlled by the Contracting Authority or a shareholder controlling the Contracting Authority, unless the stemming conflict of interest has been brought to the attention of AFD and resolved to its satisfaction;
- 3.2 Having a business or family relationship with a Contracting Authority's staff involved in the procurement process or the supervision of the resulting Contract, unless the stemming conflict of interest has been brought to the attention of AFD and resolved to its satisfaction;
- 3.3 Being controlled by or controlling another bidder or consultant, or being under common control with another bidder or consultant, or receiving from or granting subsidies directly or indirectly to another bidder or consultant, having the same legal representative as another bidder or consultant, maintaining direct or indirect contacts with another bidder or consultant which allows us to have or give access to information contained in the respective applications, bids or proposals, influencing them or influencing decisions of the Contracting Authority;
- 3.4 Being engaged in a consulting services activity, which, by its nature, may be in conflict with the assignments that we would carry out for the Contracting Authority;
- 3.5 In the case of procurement of goods, works or plants:
 - a) Having prepared or having been associated with a consultant who prepared specifications, drawings, calculations and other documentation to be used in the procurement process of this Contract;
 - b) Having been recruited (or being proposed to be recruited) ourselves or any of our affiliates, to carry out works supervision or inspection for this Contract.
4. If we are a state-owned entity, and to compete in a procurement process, we certify that we have legal and financial autonomy and that we operate under commercial laws and regulations.
5. We undertake to bring to the attention of the Contracting Authority, which will inform AFD, any change in situation with regard to points 2 to 4 here above.
6. In the context of the procurement process and performance of the corresponding contract:
 - 6.1 We have not and we will not engage in any dishonest conduct (act or omission) deliberately intended to deceive others, to intentionally conceal items, to violate or vitiate someone's consent, to make them circumvent legal or regulatory requirements and/or to violate their internal rules in order to obtain illegitimate profit;
 - 6.2 We have not and we will not engage in any dishonest conduct (act or omission) contrary to our legal or regulatory obligations or our internal rules in order to obtain illegitimate profit;
 - 6.3 We have not promised, offered or given and we will not promise, offer or give, directly or indirectly to (i) any Person who holds a legislative, executive, administrative or judicial mandate within the State of the Contracting Authority regardless of whether that Person was nominated or elected, regardless of the permanent or temporary, paid or unpaid nature of the position and regardless of the hierarchical level the Person occupies, (ii) any other Person who performs a public function, including for a State institution or a State-owned company, or who provides a public service, or (iii) any other person defined as a Public Officer by the national laws of the Contracting Authority's country, an undue advantage of any kind, for himself or for another Person or entity, for such Public Officer to act or refrain from acting in his official capacity;
 - 6.4 We have not promised, offered or given and we will not promise, offer or give, directly or indirectly to any Person who occupies an executive position in a private sector entity or works for such an entity, regardless of the nature of his/her capacity, any undue advantage of any kind, for himself or another Person or entity for such Person to perform or refrain from performing any act in breach of its legal, contractual or professional obligations;
 - 6.5 We have not and we will not engage in any practice likely to influence the contract award process to the detriment of the Contracting Authority and, in particular, in any anti-competitive practice having for object or for effect to prevent, restrict or distort competition, namely by limiting access to the market or the free exercise of competition by other undertakings;
 - 6.6 Neither we nor any of the members of our joint venture or any of our suppliers, contractors, subcontractors, consultants or subconsultants shall acquire or supply any equipment nor operate in any sectors under an embargo of the United Nations, the European Union or France;
 - 6.7 We commit ourselves to comply with and ensure that all of our suppliers, contractors, subcontractors, consultants or subconsultants comply with international environmental and labour

standards, consistent with laws and regulations applicable in the country of implementation of the Contract, including the fundamental conventions of the International Labour Organization (ILO) and international environmental treaties. Moreover, we shall implement environmental and social risks mitigation measures when specified in the environmental and social commitment plan (ESCP) provided by the Contracting Authority.

7. We, as well as members of our joint venture and our suppliers, contractors, subcontractors, consultants or subconsultants authorize AFD to inspect accounts, records and other documents relating to the procurement process and performance of the contract and to have them audited by auditors appointed by AFD.

Name: _____ In the capacity of: _____

Duly empowered to sign in the name and on behalf of¹: _____

Signature: _____

Dated: _____

¹ In case of joint venture, insert the name of the joint venture. The person who will sign the application, bid or proposal on behalf of the applicant, bidder or consultant shall attach a power of attorney from the applicant, bidder or consultant.

Schedules

PRICE SCHEDULE (BILL OF QUANTITIES)

PRICE SCHEDULE SUMMARY

Sl.	BoQ No.	Basic Amount (INR)	Tax Amount (INR)	Total Amount (INR) (Including taxes)
1.	A	Clearing & Grubbing of Site		
2.	B	Transit Accomodation Building		
3.	C	Internal Electrification (Transit Accomodation)		
4.	D	Staff Quarter		
5.	E	Internal Electrification (Staff Quarter)		
6.	F	Security Barrack		
7.	G	Internal Electrification (Security Barrack)		
8.	H	External Electrification (Campus)		
9.	I	Ancillary Works		
10.	J	Site Development Works, Raising Low Site		
11.	K	External Water Supply Distribution Network		
12.	L	Generator Shed		
13.	M	Ug Fire Fighting Sump & Pump House (Civil)		
14.	N	Ug Fire Fighting Sump & Pump House (Electrical)		
15.	O	Deep Tube Well		
16.	P	Internal Vehicular Road		
17.	Q	Internal Non Vehicular Pavement		
18.	R	Fire Fighting System Transit Accomodation		
19.	S	Fire Fighting System Staff Quarter		
20.	T	Fire Fighting System Security Barrack		
21.	U	Lift		
22.	V	125KVA sets (Supplying & Installation)		
GrandTotal				

BILL OF QUANTITIES

A. CLEARING & GRUBBING OF SITE						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
1	Clearing jungle including uprooting of rank vegetation, grass, brush wood, trees and saplings of girth up to 30 cm measured at a height of 1 m above ground level and removal of rubbish up to a distance of 50 m outside the periphery of the area cleared.	sqm	2500			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

B. TRANSIT ACCOMODATION BUILDING						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
1	PILING WORK: Boring with hydraulic piling rigs with power units, providing and installing cast in situ single under reamed piles of specified diameter and length below pile cap in M-25 cement concrete, to carry a safe working load not less than specified, excluding the cost of steel reinforcement but including the cost of boring with bentonite solution and the length of the pile to be embedded in pile cap etc. all complete. (Length of pile for payment shall be measured upto to the bottom of pile cap): 400 mm dia piles	rm	1870			
2	STEEL REINFORCEMENT: Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level.dismantling of test cap after test etc. complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	kg	164300			
3	DISMANTLING AND DEMOLISHING: Demolishing cement concrete manually/ by mechanical means including disposal of material within 50 metres lead as per direction of Engineer - in - charge. Nominal concrete 1:3:6 or richer mix (i/c equivalent design mix)	cum	13			
4	PILE TEST: Vertical load testing of piles in accordance with IS 2911 (Part IV) including installation of loading platform by Kentledge/Anchor piles method and preparation of pile head or construction of test cap and dismantling of test cap after test etc. complete as per specification & the direction of Engineer in-charge. Note: 1. Initial and Routine Load Test shall not be carried out by Dynamic method of testing. Note: 2. Testing agency shall submit the design of loading platform for the approval of Engineer-in-charge. Single pile above 50 tonne and upto 100 tonne Safe capacity					
a)	Initial test (Test Load 2.5 times the Safe capacity)	Per test	1			
b)	Routine test (Test Load 1.5 times the Safe capacity)	Per test	2			
c)	Integrity testing of Pile using Low Strain/ Sonic Integrity Test/ Sonic Echo Test method in accordance with IS 14893 including surface preparation of pile top by removing soil, mud, dust & chipping lean concrete lumps etc. and use of computerised equipment and high skill trained personal for conducting the test & submission of results, all complete as per direction of Engineer-in-charge.	Per test	100			
5	EARTHWORK:					
5.1	Earth work in excavation by mechanical means (Hydraulic excavator manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge. All kinds of soil	cum	120			
5.2	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	cum	44.50			
6	CONCRETEWORKS:					
6.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level: 1:3:6 (1 Cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm	cum	15			

B. TRANSIT ACCOMODATION BUILDING

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	nominal size derived from natural sources)					
6.2	1:5:10 (1 cement : 5 coarse sand (zone-III) derived from natural sources : 10 graded stone aggregate 40 mm nominal size derived from natural sources)	cum	35			
6.3	Providing and laying damp-proof course 40mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 12.5mm nominal size derived from natural sources)	sqm	5			
7	SUB HEAD-III: REINFORCED CEMENT CONCRETE WORK					
	FORMWORK					
7.1	Centring and shuttering including strutting,propping etc. and removal of form for					
a)	Foundations, footings, bases of columns etc. for mass concrete	sqm	145			
b)	Suspended floors, roots, landings, balconies and access platform.	sqm	1338			
c)	Stairs, (excluding landings) except spiral-staircases	sqm	75			
d)	Lintels, beams, plinth bams, griders, bressumers and cantilevers.	sqm	1235			
e)	Columns,Pillars, Piers, Abutments, Posts and Struts	sqm	665			
f)	Extra for shuttering in circular work (20% of respective centering and shuttering items)	sqm	107			
g)	Walls (any thickness) including attached pilasters, buttersesses, plinth and string courses etc.	sqm	750			
7.2	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in- charge; for the following grades of concrete. Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement.					
a)	All works upto plinth level Concrete of M25 grade with minimum cement content of 330 kg/cum	cum	170			
b)	All works above plinth level upto floor V level Concrete of M25 grade with minimum cement content of 330 kg/cum	cum	686.50			
7.3	Steel reinforcement for R.C.C. work including straightening, cutting,bending, placing in position and binding all complete upto plinth level.dismantling of test cap after test etc. complete: Thermo-Mechanically Treated bars of grade Fe- 500D or more.	kg	143822			
8	BRICKWORK					
8.1	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation & plinth in: Cement mortar 1:6 (1 cement : 6 coarse sand)	cum	26			
	HALF BRICK MASONRY					
8.2	Half brick masonry with non modular fly ash bricks of class designation 10, conforming to IS: 12894, in super structure above plinth and upto floor V level. Cement mortar 1:4 (1 cement :4 coarse sand)	sqm	2206			
9	MARBLE & GRANITE WORK					
9.1	Providing and fixing 18 mm thick gang saw cut, mirror	sqm	229			

B. TRANSIT ACCOMODATION BUILDING

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels. Granite of any colour and shade Area of slab upto 0.50 sqm					
10	FLOORING					
10.1	Cement concrete flooring 1:2:4 (1 cement : 2 coarse sand :4 gradedstone aggregate) finished with a floating coat of neat cement, including cement slurry, but excluding the cost of nosing of steps etc. complete. 40 mm thick with 20 mm nominal size stone aggregate	sqm	7.50			
10.2	Cement plaster skirting up to 30 cm height, with cement mortar 1:3 (1 cement : 3 coarse sand), finished with a floating coat of neat cement. 18 mm thick	sqm	2			
11	TILES					
11.1	Providing and laying rectified Glazed Ceramic floor tiles of size 300x300 mm or more (thickness to be specified by the manufacturer), of 1st quality conforming to IS : 15622, of approved make, in colours White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement: 4 Coarse sand), jointing with grey cement slurry @ 3.3 kg/sqm including grouting the joints with white cement and matching pigments etc., complete.	sqm	145			
11.2	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in- Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	sqm	360			
11.3	Providing and laying vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS: 15622, of approved make, in all colours and shades, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand), jointing with grey cement slurry @ 3.3 kg/sqm including grouting the joints with white cement and matching pigments etc., complete. Size of Tile 600x600 mm	sqm	1133			
11.4	Providing and laying 60mm thick factory made cement concrete interlocking paver block of M -30 grade made by block making machine with strong vibratory compaction, of approved size, design & shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand, filling the joints with line sand etc. all complete as per the direction of Engineer-in-charge.					
11.5	Providing and laying Polished Granite stone flooring in required design and patterns, in linear as well as curvilinear portions of the building all complete as per the architectural drawings with 18 mm thick stone slab over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with cement slurry and pointing with white cement slurry admixed with pigment of matching shade including rubbing, curing and polishing etc. all complete as specified and as					

B. TRANSIT ACCOMODATION BUILDING

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	directed by the Engineer-in-Charge. Polished Granite stone slab colour of Black, Cherry/ Ruby Red or equivalent	sqm	229			
11.6	Providing and laying Ceramic glazed floor tiles of size 300x300 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 15622 of approved make in colours such as White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand), Jointing with grey cement slurry @ 3.3 kg/sqm including pointing the joints with white cement and matching pigment etc.,complete.	sqm	102			
12	SUB HEAD: FINISHING WORK					
12.1	12mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	sqm	8600			
12.2	15 mm cement plaster on the rough side of single or half brick wall of mix : 1:6 (1 cement : 6 fine sand)	sqm	2205.50			
12.3	6 mm cement plaster to ceiling of mix : 1:3(1 cement:3 coarse sand)	sqm	2073			
13	SUB HEAD: ALUMINIUM WORK					
13.1	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, paneling and dash fasteners to be paid for separately) : For fixed portion Powder coated aluminum (minimum thickness of powder coating 50 micron)	kg	127.80			
13.2	For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making provision for fixing of fittings wherever required including the cost of EPDM rubber / neoprene gasket required (Fittings shall be paid for separately) Powder coated aluminum (minimum thickness of powder coating 50 micron)	kg	95			
13.3	Filling the gap in between aluminium/ stone/ wood frame and adjacent RCC/Brick/ Stone/ wood/ Ceramic/ Gypsum work by providing weather/structural non sag elastomeric PU sealant over backer rod of approved quality as per architectural drawings and direction of Engineer-in-charge complete, complying to ASTM C920, DIN 18540- F & ISO 11600 Upto 10 mm depth and 10 mm width	Metre	42.60			
13.4	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with EPDM rubber / neoprene gasket etc. complete as per the architectural drawings and the directions of engineer-in-charge. (Cost of aluminium snap beading shall be paid in basic item): With float glass panes of 5 mm thickness (weight not less than 12.50 kg/sqm)	sqm	19			
14	PVC DOOR & FRAMES					
14.1	Providing and fixing PVC Door Frame of size 50x47 mm with a wall thickness of 5 mm (± 0.2 mm), made out of single piece extruded PVC profile, with mitred cut joints and joint with 2 nos of PVC bracket of size 190 mm x	rm	15			

B. TRANSIT ACCOMODATION BUILDING

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	100 mm long arms of cross section size 35 x 15 mm & self driven self tapping screws, the vertical door profiles to be reinforced with 40x20 mm M.S. rectangular tube of 0.8 mm, including providing EPDM rubber gasket weather seal throughout the frame, including jointing 5 mm PVC frame strip with PVC solvent cement on the back of the profile. The door frame to be fixed to wall using 8 x100 mm long anchor fasteners complete, all as per manufacturer's specification and direction of Engineer -in- charge.					
14.2	Providing and fixing to existing door frames. 24 mm thick factory made PVC door shutters made of styles and rails of a uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. The styles and rails mitred and joint at the corners by means of M.S. galvanised/ plastic brackets of size 75x220 mm having wall thickness 1.0 mm and stainless steel screws. The styles of the shutter reinforced by inserting galvanised M.S. tube of size 20x20 mm and 1 mm (± 0.1 mm) wall thickness. The lock rail made up of 'H' section, a uPVC hollow section of size 100x24 mm and 2 mm (± 0.2 mm) wall thickness, fixed to the shutter styles by means of plastic/ galvanised M.S. 'U' cleats. The shutter frame filled with a uPVC multi-chambered single panel of size not less than 620 mm, having over all thickness of 20 mm and 1 mm (± 0.1 mm) wall thickness. The panels filled vertically and tie bar at two places by inserting horizontally 6 mm galvanised M.S. rod and fastened with nuts and washers, complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).	sqm	5.10			
15	GRILLS Providing and fixing M.S. round or square bars with M.S. flats at required spacing in wooden frames of windows and clerestory windows.	kg	2659			
16	PLINTH PROTECTION WORK Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources) over 75 mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including necessary excavation, levelling & dressing & finishing the top smooth.	sqm	66			
17	WATERPROOFING					
17.1	Providing and applying integral crystalline (dry shake) of hydrophilic in nature for waterproofing treatment to the RCC structures like basement raft, foundation slab, sewage & water treatment plant slab, warehouses floor, parking structures and water tank base slab etc. sprinkled @ 0.60kg per sqm or higher as recommended by the Engineer	sqm	435			
17.2	Providing and laying water proofing treatment in sunken portion of WCs, bathroom etc., by applying cement slurry mixed with water proofing cement compound consisting of applying : (a) First layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/ sqm. This layer will be allowed to air cure for 4 hours (b) Second layer of slurry of cement @ 0.242 kg/sqm mixed with water proofing cement compound @ 0.126 kg/sqm. This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours. The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes and masonry with polymer mixed slurry.	sqm	142.50			
18	ANTI TERMITE TREATMENT					

B. TRANSIT ACCOMODATION BUILDING

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
18.1	Diluting and injecting chemical emulsion for POST-CONSTRUCTIONAL anti-termite treatment (excluding the cost of chemical emulsion) : Along external wall where the apron is not provided using chemical emulsion @ 7.5 litres / sqm of the vertical surface of the substructure to a depth of 300mm including excavation channel along the wall & rodding etc. complete: With Chlorpyriphos/ Lindane E.C. 20% with 1% concentration	Metre	392			
18.2	Treatment of soil under existing floors using chemical emulsion @ one litre per hole, 300 mm apart including drilling 12 mm diameter holes and plugging with cement mortar 1 :2 (1 cement : 2 Coarse sand) to match the existing floor: With Chlorpyriphos/Lindane E.C. 20% with 1% concentration	sqm	385			
19	STEELRAILING Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners , stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-in-charge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.).	kg	1530			
20	UPVCDOORS/WINDOWS/FIXED WINDOWS:					
20.1	Providing and fixing factory made uPVC white colour fixed glazed windows/ ventilators comprising of uPVC multi-chambered frame and mullion (where ever required) extruded profiles duly reinforced with 1.60 ± 0.2 mm thick galvanized mild steel section made from roll forming process of required length (shape & size according to uPVC profile), , uPVC extruded glazing beads of appropriate dimension, EPDM gasket, G.I fasteners 100 x 8 mm size for fixing frame to finished wall, plastic packers, plastic caps and necessary stainless steel screws etc. Profile of frame shall be mitred cut and fusion welded at all corners, mullion (if required) shall be also fusion welded including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with weather proof silicon sealant over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge. (Single / double glass panes and silicon sealant shall be paid separately). Variation in profile dimension in higher side shall be accepted but no extra payment on this account shall be made. Note: For uPVC frame, sash and mullion extruded profiles minus 5% tolerance in dimension i.e. in Fixed window / ventilator made of (small series) frame 47 x 50 mm & mullion 47 x 68 mm both having wall thickness of 1.9 ± 0.2 mm and single glazing bead of appropriate dimension. (Area upto 0.75 sqm.)	sqm	6.50			
20.2	Providing and fixing factory made uPVC white colour sliding glazed window upto 1.50 m in height dimension comprising of uPVC multi-chambered frame with in-built roller track and sash extruded profiles duly reinforced with 1.60 ± 0.2 mm thick galvanized mild steel section made from roll forming process of required length (shape & size according to uPVC profile), appropriate dimension of uPVC extruded glazing beads					

B. TRANSIT ACCOMODATION BUILDING

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	and uPVC extruded interlocks, EPDM gasket, wool pile, zinc alloy (white powder coated) touch locks with hook, zinc alloy body with single nylon rollers (weight bearing capacity to be 40 kg), G.I fasteners 100 x 8 mm size for fixing frame to finished wall and necessary stainless steel screws etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners, including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with weather proof silicon sealant over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge. (Single / double glass panes, wire mesh and silicon sealant shall be paid separately). Variation in profile dimension in higher side shall be accepted but no extra payment on this Two track two panels sliding window made of (big series) frame 67 x 50 mm & sash 46 x 62 mm both having wall thickness of 2.3 ± 0.2 mm and single glazing bead/ double glazing bead of appropriate dimension. (Area of window above 1.75 sqm upto 2.50 sqm).	sqm	208			
20.3	Providing and fixing factory made uPVC white colour casement/casement cum fixed glazed windows comprising of uPVC multi-chambered frame, sash and mullion (where ever required) extruded profiles duly reinforced with 1.60 ± 0.2 mm thick galvanized mild steel section made from roll forming process of required length (shape & size according to uPVC profile), uPVC extruded glazing beads of appropriate dimension, EPDM gasket, stainless steel (SS 304 grade) friction hinges, zinc alloy (white powder coated) casement handles, G.I fasteners 100 x 8 mm size for fixing frame to finished wall, plastic packers, plastic caps and necessary stainless steel screws etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners, mullion (if required) shall be also fusion welded including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with weather proof silicon sealant over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge. (Single / double glass panes and silicon sealant shall be paid separately). Variation in profile dimension in higher side shall be accepted but no extra payment on this Casement window single panel with S.S. friction hinges (300 x 19 x 1.9 mm), made of (small series) frame 47 x 50 mm & sash 47 x 68 mm both having wall thickness of 1.9 ± 0.2mm and single glass pane glazing bead of appropriate dimension. (Area of window upto 0.75 sqm.)	sqm	16			
20.4	Providing and fixing factory made uPVC white colour sliding glazed door comprising of uPVC multi-chambered frame with in-built roller track and sash extruded profiles duly reinforced with 1.60 ± 0.2 mm thick galvanized mild steel section made from roll forming process of required length (shape & size according to uPVC profile), appropriate dimension uPVC extruded glazing beads, uPVC extruded interlock and uPVC extruded Inline sash adaptor (if required), EPDM gasket, wool pile, zinc alloy (white powder coated) handle with key on one side of extreme panels along with zinc plated mild steel multi point locking having transmission gear with keeps, zinc alloy (white powder coated) crescent lock (if required), stainless steel (SS 304 grade) body with adjustable double nylon rollers (weight bearing capacity to be 120 kg), G.I fasteners 100 x 8 mm size for fixing frame to finished	sqm	8.50			

B. TRANSIT ACCOMODATION BUILDING

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	wall and necessary stainless steel screws etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners, including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with weather proof silicon sealent over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Two track two panels sliding door made of (big series) frame 67 x 50 mm & sash 46 x 82 mm both having wall thickness of 2.3 ± 0.2 mm and single glazing bead / double glazing bead of appropriate dimension. (Area of door above 2.00 sqm upto 5.00 sqm)					
20.5	Three track three panels sliding window with fly proof S.S wire mesh (Two nos. glazed & one no. zire mesh panels) made of (big series) frame 116 x 45 mm & sash 46 x 62 mm both having wall thickness of 2.3 ± 0.2 mm & single glazing bead / double glazing bead of appropriate dimension. (Area of window above 1.75 sqm).	sqm	208			
21	PLASTER OF PARIS & WALL PUTTY Providing and applying plaster of paris putty of 2 mm thickness over plastered surface to prepare the surface even and smooth complete.	sqm	10805			
22	EXTERIOR PAINTS Finishing walls with Acrylic Smooth exterior paint of required shade : New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm)	sqm	2960			
23	GYPBOARD WORK Providing and fixing false ceiling at all height including providing and fixing of frame work made of special sections, power press ed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (both side inclusive) as per IS : 277 and consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50mm long with 6mm dia bolts, other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I. channels 45x15x0.9 mm running at the spacing of 1200 mm centre to centre, to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre, shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made out of 2.64 mm dia x 230 mm long G.I. wire at every junction, including fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25mm long dry wall screws @ 230 mm interval, including fixing of gypsum board to ceiling section and perimeter channel with the help of dry wall screws of size 3.5 x 25mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound , jointing tapes , finishing with jointing compound in 3 layers covering upto 150 mm on both sides of joint and two coats of primer suitable for board, all as per manufacturer's specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed, all complete as per drawings, specification and direction of the Engineer in Charge but excluding the cost of painting with :	sqm	563			

B. TRANSIT ACCOMODATION BUILDING

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	12.5 mm thick tapered edge gypsum moisture resistant board					
24	SANITARYWORKS					
24.1	Providing and fixing water closet squatting pan (Indian type W.C.pan) with 100 mm sand cast Iron P or S trap, 10 litre low level white P.V.C. flushing cistern, including flush pipe, with manually controlled device (handle lever) conforming to IS : 7231, with all fittings and fixtures complete, including cutting and making good the walls and White Vitreous china Orissa pattern W.C. pan of size 580x440 mm with integral type foot rests	each	1			
24.2	Providing and fixing vitreous china dual purpose closet suitable for use as squatting pan or European type water closet (Anglo Indian W.C pan) with seat & lid fixed with C.P. brass hinges and rubber buffers, 10 litre low level flushing cistern with fitting and brackets, 40 mm flush bend, 20 mm over flow pipe, with specials of standard make and mosquito proof coupling of approved municipal design complete, including painting of fittings and brackets, cutting and making good the walls and floors wherever required: White vitreous china dual purpose WC pan with white solid plastic seat and lid with white vitreous china flushing cistern and C.P. flush bend.	each	2			
24.3	Providing and fixing floor mounted, white vitreous china single piece, double traps syphonic water closet of approved brand/make, shape, size and pattern including integrated white vitreous china cistern of capacity 10 litres with dual flushing system, including all fittings and fixtures with seat cover, cistern fittings, nuts, bolts and gasket etc	each	14			
24.4	including making connection with the existing P/S trap, complete in all respect as per directions of Engineer-in-Charge.	each	2			
24.5	Providing and fixing white vitreous china squatting plate urinal with integral rim longitudinal flush pipe.	each	1			
24.6	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS:13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required : Kitchen sink with drain board 510x1040 mm bowl depth 225 mm each Kitchen sink without drain board 610x510 mm bowl depth 200	each each	1 3			
24.7	Providing and fixing 600x450 mm beveled edge mirror of superiorglass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete.each	each	21			
24.8	Providing and fixing 600x120x5 mm glass shelf with edges round off, supported on anodised aluminium angle frame with C.P. brass brackets and guard rail complete fixed with 40 mm long screws, rawl plugs etc., complete.	each	21			
24.9	Providing and fixing PTMT liquid soap container 109 mm wide, 125 mm high and 112 mm distance from wall of standard shape with bracket of the same materials with snap fittings of approved quality and colour, weighing not less than 105 gms.	each	28			
24.10	Providing and fixing PTMT towel rail complete with brackets fixed to wooden cleats with CP brass screws with concealed fittings arrangement of approved quality and colour. 600 mm long towel rail with total length of 645 mm, width 78 mm and effective height of 88 mm, weighing not less than 190 gms.	each	21			
24.11	Providing and fixing toilet paper holder : C.P. brass each	each	16			

B. TRANSIT ACCOMODATION BUILDING

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
24.12	Providing and fixing PTMT Waste Coupling for wash basin and sink, of approved quality and colour. Waste coupling 38 mm dia of 83 mm length and 77mm breadth, weighing not less than 60 gms.	each	25			
24.13	Providing and fixing PTMT Bottle Trap for Wash basin and sink. Bottle trap 31mm single piece moulded with height of 270 mm, effective length of tail pipe 260 mm from the centre of the waste coupling, 77 mm breadth with 25 mm minimum water seal, weighing not less than 260 gms	each	21			
24.14	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall	metre				
	32 mm nominal dia Pipes	metre	30			
	40 mm nominal dia Pipes	metre	80			
	50 mm nominal dia Pipes	metre	120			
24.15	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge.					
	Concealed work, including cutting chases and making good the walls etc.	metre	180			
	20 mm nominal dia Pipes	metre	40			
	25 mm nominal dia Pipes	metre	20			
25	BIB COCK Providing and fixing C.P. brass long nose bib cock of approved quality conforming to IS standards and weighing not less than 810 gms. 15 mm nominal bore	each	18			
26	STOP COCK: Providing and fixing brass stop cock of approved quality :					
	15 mm nominal bore	each	55			
	20 mm nominal bore	each	4			
27	PILLARCOCK Providing and fixing PTMT pillar cock of approved quality and colour. 15 mm nominal bore, 125 mm long foam flow, weighing not less than 120 gms	each	21			
28	WATER TANK: Providing and placing on terrace (at all floor levels) polyethylene water storage tank, IS : 12701 marked, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	Per lire	12000			
29	FINISHING WORK					
29.1	Providing and fixing nickel plated M.S. pipe curtain rods with nickel plated brackets : 25 mm dia (heavy type)	rm	42			
29.2	Providing and fixing aluminium sliding door bolts, ISI marked anodised (anodic coating not less than grade AC 10 as per IS : 1868), transparent or dyed to required colour or shade, with nuts and screws etc. complete : 300x16 mm	each	67			
29.3	Providing and fixing aluminium tower bolts, ISI marked, anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade, with necessary screws etc. complete :	each	136			

B. TRANSIT ACCOMODATION BUILDING

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	250x10 mm					
29.4	Providing and fixing aluminium handles, ISI marked, anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade, with necessary screws etc. complete : 125 mm	each	135			
29.5	Providing and fixing aluminium die cast body tubular type universal hydraulic door closer (having brand logo with ISI, IS : 3564, embossed on the body, door weight upto 35 kg and door width upto 700 mm), with necessary accessories and screws etc. complete.	each	41			
29.6	Providing and fixing special quality chromium plated brass cupboard locks with six levers of approved quality including necessary screws etc. complete: Size 50 mm	each	14			
29.7	Providing and fixing 50 mm bright finished brass cupboard or wardrobe knob of approved quality with necessary screws.	each	28			
29.8	Providing and fixing bright finished brass hanging type floor door stopper with necessary screws, etc. complete.	each	41			
29.9	Providing and fixing Pre-laminated flat pressed 3 layer (medium density) particle board or graded wood particle board IS : 3087 marked, with one side decorative and other side balancing lamination Grade I, Type II exterior grade IS : 12823 marked, in shelves with screws and fittings wherever required, edges to be painted with polyurethane primer (fittings to be paid separately). 18 mm thick	sqm	75			
29.10	Providing and fixing specified wood frame work consisting of battens 50x25mm fixed with rawl plug and drilling necessary holes for rawl plug etc. including priming coat complete. Kiln seasoned and chemically treated hollock wood	cum	1.75			
29.11	Providing & Fixing decorative high pressure laminated sheet of plain / wood grain in gloss / matt/ suede finish with high density protective surface layer and reverse side of adhesive bonding quality conforming to IS : 2046 Type S, including cost of adhesive of approved quality. 1.0 mm thick	sqm	295			
29.12	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required. In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works	kg	1080			
29.13	Neat cement punning.	sqm	35			
29.14	Providing gola 75x75 mm in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 10 mm and down gauge), including finishing with cement mortar 1:3 (1 cement : 3 fine sand) as per standard design : In 75x75 mm deep chase	mtr	99			
29.15	Making khurras 45x45 cm with average minimum thickness of 5 cm cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) over P.V.C. sheet 1 m x1 m x 400 micron, finished with 12 mm cement plaster 1:3 (1 cement : 3 coarse sand) and a coat of neat cement, rounding the edges and making and finishing the outlet complete.	each	7			
29.16	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams.	each	7			
29.17	Distemping with 1st quality acrylic distemper, having VOC (Volatile Organic Compound) content less than 50 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required, to achieve even shade and colour: one coat	sqm	755			
29.18	Wall painting with premium acrylic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and	sqm	7730.50			

B. TRANSIT ACCOMODATION BUILDING

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	manufacture, including applying additional coats wherever required to achieve even shade and colour: Two coat					
29.19	Applying priming coats with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound) content:					
	With ready mixed pink or grey primer on wood work (hard and soft wood) having VOC content less than 50 grams/litre	Sqm	315			
	With water thinnable cement primer on wall surface having VOC content less than 50 grams/litre sqm	sqm	10805.50			
30	SCAFFOLDING: Providing and fixing double scaffolding system (cup lock type) on the exterior side, up to seven story height made with 40 mm dia M.S. tube 1.5 m centre to centre, horizontal & vertical tubes joining with cup & lock system with M.S. tubes, M.S. tube challies, M.S. clamps and M.S. staircase system in the scaffolding for working platform etc. and maintaining it in a serviceable condition for the required duration as approved and removing it there after .The scaffolding system shall be stiffened with bracings, runners, connection with the building etc wherever required for inspection of work at required locations with essential safety features for the workmen etc. complete as per directions and approval of Engineerin- charge .The elevational area of the scaffolding shall be measured for payment purpose .The payment will be made once irrespective of duration of scaffolding.	sqm	988.80			
31	STRUCTURAL GLAZING: Providing, assembling and supplying vision glass panels (IGUs) comprising of hermetically-sealed 6- 12- 6 mm insulated glass (double glazed) vision panel units of size and shape as required and specified, comprising of an outer heat strengthened float glass 6mm thick, of approved colour and shade with reflective soft coating on surface # 2 of approved colour and shade, an inner Heat strengthned clear float glass 6mm thick, spacer tube 12mm wide, dessicants, including primary seal and secondary seal (structural silicone sealant) etc. all complete for the required performances, as per the Architectural drawings, as per the approved shop drawings, as specified and as directed by the Engineer-in-Charge. The IGUs shall be assembled in the factory/ workshop of the glass processor. Coloured tinted float glass 6mm thick substrate with reflective soft coating on face # 2, + 12mm Airgap + 6mm Heat Strengthened clear Glass of approved make having properties as visible Light transmittance (VLT) of 25 to 35 %, Light reflection internal 10 to 15%, light reflection external 10 to 20 %, shading coefficient (0.25- 0.28) and U value of 3.0 to 3.3 W/ m2 degree K etc. The properties of performance glass shall be decided by technical sanctioning authority as per the site requirement.	sqm	988.80			
	SEPTIC TANK - 50 USERS					
32	EARTHWORK IN EXCAVATION					
	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge: All kinds of soil	cum	9.301			
33	PLAIN CEMENT CONCRETE WORKS: Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand (zone-III): 6 graded stone	cum	2.355			

B. TRANSIT ACCOMODATION BUILDING

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	aggregate 40 mm nominal size)					
34	REINFORCED CEMENT CONCRETE WORKS					
34.1	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size)	cum	0.016			
34.2	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement with 1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) : 3 graded stone aggregate 20 mm nominal size).	cum	0.776			
35	FORMWORK: Centering and shuttering including strutting, propping etc. and removal of form for :					
	Foundations, footings, bases of columns, etc. for mass concrete	Sqm	2.344			
	Lintels, beams, plinth beams, girders, bressumers and cantilevers	sqm	0.374			
36	REINFORCEMENT: Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level: Thermo-Mechanically Treated bars of grade Fe- 500D or more.	kg	380.380			
37	MASONARY WORK					
37.1	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:4 (1 cement : 4 coarse sand)	cum	4.855			
38.2	Half brick masonry with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundations and plinth in : Cement mortar 1:4 (1 cement : 4 coarse sand)	sqm	19.654			
38	CEMENT PLASTERING					
38.1	15 mm cement plaster on the rough side of single or half brick wall of mix : 1:4 (1 cement: 4 fine sand)	sqm	40.966			
38.2	12 mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	sqm	5.027			
38.3	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings This includes jointing of pipes & fittings with one step CPVC solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in Charge: 100 mm nominal dia Pipes	rm	7.50			
39	MANHOLE COVER					
39.1	Providing and fixing in position pre-cast R.C.C. manhole cover and frame of required shape and approved quality: L D- 2.5, Circular shape 450 mm internal diameter	each	2.00			
39.2	Making soak pit 2.5 m diameter 3.0 metre deep with 45 x 45 cm dry brick honey comb shaft with bricks and S.W. drain pipe 100 mm diameter, 1.8 m long complete as per standard design: With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	each	1.00			
39.3	Constructing brick masonry chamber for underground C.I. inspection chamber and bends with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg), R.C.C. top slab with 1:1.5:3 mix (1 cement : 1.5 fine sand : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm					

B. TRANSIT ACCOMODATION BUILDING

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design: Inside dimension 455X610mm and 45 cm deep for single pipe line: With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	each	4.00			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

C. INTERNAL ELECTRIFICATION (TRANSIT ACCOMODATION)						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
1	WIRING:					
1.1	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.					
	2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	rm	1300			
	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	rm	100			
	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	rm	350			
	4 X 10 sq. mm + 2 X 6 sq. mm earth wire	rm	160			
1.2	Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required: 2 x 1.5 sq. mm	mtr	900			
	Supplying and fixing following piano type switch/ socket on the existing switch box/ cover including connections etc. as required:					
	5/6 amps switch	each	60			
	3 pin 5/6 A socket outlet	each	60			
1.3	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required: Group C	point	14			
1.4	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as: 2 X 4 sq. mm + 1 X 4 sq. mm earth wire	mtr	375			
1.5	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.					
	Group A	point	93			
	Group B	point	125			
	Group C	point	94			
2	MODULAR SWITCH					
2.1	Supplying and fixing following Modular base & cover plate on existing modular metal boxes etc. as required.					
	1 or 2 Module	each	16			
	3 Module	each	40			
	4 Module	each	12			
	6 Module	each	12			
	8 Module	each	20			
	12 Module	each	12			
2.2	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.					
	TV antenna socket outlet	each	14			
	Telephone socket outlet	each	18			
2.3	Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	each	25			
2.4	Supplying and fixing two module stepped type electronic fan regulator on the existing modular plate switch box including connections but excluding modular plate etc. as required.	each	51			
2.5	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as	each	14			

C. INTERNAL ELECTRIFICATION (TRANSIT ACCOMODATION)						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	required. Bell push					
2.6	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.					
	6 pin 15/16 amp socket outlet	each	25			
	3 pin 5/6 amp socket outlet	each	74			
	15/16 amp switch	each	25			
	5/6 amps switch	each	372			
2.7	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required: 20 mm	rm	200			
2.8	Supplying and drawing co-axial TV cable RG-6 grade, 0.7 mm solid copper conductor PE insulated, shielded with fine tinned copper braid and protected with PVC sheath in the existing surface/ recessed steel/ PVC conduit as required.	Each	250			
2.9	Supplying and drawing following pair 0.5 mm dia FRLS PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC conduit as required.	rm	800			
3	FITTINGS AND ACCESSORIES					
3.1	Installation, testing and commissioning of ceiling fan, including wiring the down rods of standard length (upto 30 cm) with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable, including providing and fixing phenolic laminated sheet cover on the fan box etc. as required.	each	51			
3.2	Supplying and fixing stiff pendent with 300 mm long, 20 mm dia X 1.6 mm thick steel conduit, aluminium cast back plate and brass holder complete, including wiring the down rod with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable and painting etc. as required.	each	14			
4	MCB DB					
4.1	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)					
	6 way, Double door	each	4			
	8 way, Double door	each	7			
	12 way, Double door	each	4			
4.2	Supplying and fixing of following ways surface/ recess mounting, vertical type, 415 V, TPN MCB distribution board of sheet steel, dust protected, duly powder painted, inclusive of 200 A tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCBs (but without MCBs and incomer) as required . (Note: Vertical type MCB TPDB is normally used where 3 phase outlets are required.)					
	4 way (4 + 12), Double door Each	each	4			
4.3	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.					
	Single pole	each	92			
	Double pole	each	11			
4.4	Supplying & fixing following rating, four pole (three phase and neutral), 415 volts, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required: 40A	each	9			
4.5	Supplying & fixing following rating, double pole, (single	each	1			

C. INTERNAL ELECTRIFICATION (TRANSIT ACCOMODATION)						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	phase and neutral), 240 V, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required: 25A					
4.6	Supplying and fixing following rating, four pole, (three phase and neutral), 415 volts, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required: 40A	each	10			
5	EARTHING					
5.1	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	Each	4			
5.2	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	set	2			
5.3	Supplying and laying 6 SWG G.I. wire at 0.50 metre below ground level for conductor earth electrode, including connection/ termination with GI thimble etc. as required.	metre	100			
5.4	Supplying and laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of brass nut bolt & spring washer spaced at 50mm)	metre	100			
5.5	Supplying and laying 25 mm X 5 mm G.I. strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with G.I. nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm)	metre	100			
5.6	Providing and fixing of lightning conductor finial, made of 25 mm dia 300 mm long, G.I. tube, having single prong at top, with 85 mm dia 6 mm thick G.I. base plate including holes etc. complete as required.	each	2			
5.7	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required. (For vertical run)	metre	180			
6	LUMINARIES					
6.1	20 watt LED striplite luminaries with fitting	each	41			
6.2	20 watt sleek box type luminaries with fittings complete	each	16			
6.3	Supplying, installing, testing 16w square typed LED luminaries.	each	47			
6.4	LED skirting light	each	14			
7	CEILING FANS, EXHAUST FANS AND AIR CURTAINS					
7.1	Supplying, fitting, fixing 1200mm sweep premium model A.C ceiling fan.	each	40			
7.2	Supplying, fitting, fixing Ventil Air DB 300 mm sweep A.C exhaust fan.	each	20			
7.3	Supplying, fitting, fixing 400mm sweep A.C wall	each	1			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

D. STAFF QUARTER						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
1	STEEL REINFORCEMENT					
	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level.dismantling of test cap after test etc. complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	kg	33100			
2	EARTHWORK					
2.1	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge: All kinds of soil	cum	280			
2.2	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	cum	30			
3	CONCRETEWORKS					
3.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources)	cum	22.50			
3.2	1:5:10 (1 cement : 5 coarse sand (zone-III) derived from natural sources : 10 graded stone aggregate 40 mm nominal size derived from natural sources)	cum	8			
3.3	Providing and laying damp-proof course 40mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 12.5mm nominal size derived from natural sources)	cum	7			
4	REINFORCED CEMENT CONCRETE WORK					
	FORMWORK:					
4.1	Centering and shuttering including strutting, propping etc. and removal of form for					
a)	Foundations, footings, bases of columns etc. for mass concrete.	sqm	19			
b)	Suspended floors, roofs, landings, balconies and access platform.	sqm	650			
c)	Stairs, (excluding landings) except spiral-staircases	sqm	88			
d)	Lintels, beams, plinth bams, grids, bressumers and cantilevers.	sqm	619			
e)	Columns, Pillars, Piers, Abutments, Posts and Struts	sqm	507			
f)	Extra for shuttering in circular work (20% of respective centering and shuttering items)	sqm	49.50			
g)	Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.	sqm	338			
4.2	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana/ Ordinary Portland/Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement:					

D. STAFF QUARTER

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	All works upto plinth level: Concrete of M25 grade with minimum cement content of 330 kg/cum	cum	52			
	All works above plinth level upto floor V level: Concrete of M25 grade with minimum cement content of 330 kg/cum	cum	200			
4.3	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. dismantling of test cap after test etc. complete: Thermo-Mechanically Treated bars of grade Fe- 500D or more.	kg	33100			
5	BRICKWORK: Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:6 (1 cement : 6 coarse sand)	cum	8			
6	HALF BRICK MASONRY					
6.1	Half brick masonry with non modular fly ash bricks of class designation 10, conforming to IS : 12894, in super structure above plinth and upto floor V level: Cement mortar 1:4 (1 cement :4 coarse sand)	sqm	674.50			
6.2	Extra for additional cost of centering for arches exceeding 6m span including all shuttering, bolting, wedging and removal (Area of the soffit to be measured).	sqm	237			
7	FLOORING					
7.1	Cement concrete flooring 1:2:4 (1 cement : 2 coarse sand :4 graded stone aggregate) finished with a floating coat of neat cement, including cement slurry, but excluding the cost of nosing of steps etc. complete: 40 mm thick with 20 mm nominal size stone aggregate	Sqm	317			
7.2	Cement plaster skirting up to 30 cm height, with cement mortar 1:3 (1 cement : 3 coarse sand), finished with a floating coat of neat cement: 18 mm thick	sqm	57			
8	TILES					
8.1	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in- Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	sqm	109			
8.2	Providing and laying 60mm thick factory made cement concrete interlocking paver block of M -30 grade made by block making machine with strong vibratory compaction, of approved size, design & shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand, filling the joints with line sand etc. all complete as per the direction of Engineer-in-charge.	sqm	88			
8.3	Providing and laying Ceramic glazed floor tiles of size 300x300 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 15622 of approved make in colours such as White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand), Jointing with grey cement slurry @ 3.3 kg/sqm including pointing the joints with white cement and matching pigment etc., complete.	sqm	23			
9	FINISHING WORK					
9.1	12mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	Sqm	2736			
9.2	15 mm cement plaster on the rough side of single or half brick wall of mix : 1:6 (1 cement : 6 fine sand)	Sqm	675			
9.3	6 mm cement plaster to ceiling of mix : 1:3(1 cement: 3 coarse sand)	Sqm	641			
9.4	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and					

D. STAFF QUARTER

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	Sqm	2736			
9.5	Finishing walls with textured exterior paint of required shade: New work (Two or more coats applied @ 3.28 ltr/10 sqm) over and including priming coat of exterior primer applied @ 2.20kg/10 sqm	Sqm	1131			
10	ALUMINIUM WORK: Providing and fixing double glazed hermetically sealed glazing in aluminium windows, ventilators and partition etc. with 6 mm thick clear float glass both side, having 12 mm air gap, including providing EPDM gasket, perforated aluminium spacers, desiccants, sealant (Both primary and secondary sealant) etc. as per specifications, drawings and direction of Engineer-in-charge complete.	sqm	94.50			
11	PVC DOOR & FRAMES					
11.1	Providing and fixing PVC Door Frame of size 50x47 mm with a wall thickness of 5 mm (± 0.2 mm), made out of single piece extruded PVC profile, with mitred cut joints and joint with 2 nos of PVC bracket of size 190 mm x 100 mm long arms of cross section size 35 x 15 mm & self driven self tapping screws, the vertical door profiles to be reinforced with 40x20 mm M.S. rectangular tube of 0.8 mm, including providing EPDM rubber gasket weather seal throughout the frame, including jointing 5 mm PVC frame strip with PVC solvent cement on the back of the profile. The door frame to be fixed to the wall using 8 x100 mm long anchor fasteners complete, all as per manufacturer's specification and direction of Engineer -in- charge.	rm	60			
11.2	Providing and fixing to existing door frames: 24 mm thick factory made PVC door shutters made of styles and rails of a uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. The styles and rails mitred and joint at the corners by means of M.S. galvanised/ plastic brackets of size 75x220 mm having wall thickness 1.0 mm and stainless steel screws. The styles of the shutter reinforced by inserting galvanised M.S. tube of size 20x20 mm and 1 mm (± 0.1 mm) wall thickness. The lock rail made up of 'H' section, a uPVC hollow section of size 100x24 mm and 2 mm (± 0.2 mm) wall thickness, fixed to the shutter styles by means of plastic/galvanised M.S. 'U' cleats. The shutter frame filled with a uPVC multi-chambered single panel of size not less than 620 mm, having over all thickness of 20 mm and 1 mm (± 0.1 mm) wall thickness. The panels filled vertically and tie bar at two places by inserting horizontally 6 mm galvanised M.S. rod and fastened with nuts and washers, complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).	Sqm	20			
12	PLINTH PROTECTION WORK: Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources) over 75mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including necessary excavation, levelling & dressing & finishing the top smooth.	sqm	33			
13	WATER PROOFING: Providing and applying integral crystalline (dry shake) of hydrophilic in nature for waterproofing treatment to the RCC structures like basement raft, foundation slab, sewage & water treatment plant slab, warehouses floor, parking structures and water tank base slab etc. sprinkled @0.60kg per sqm or higher as recommended					

D. STAFF QUARTER

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	by the manufacturer's specification over the lean concrete of above cited structures. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e. by reducing permeability of concrete by more than 85%, compared control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline dryshake shall be capable of self healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the Engineer-in-charge. The product performance shall carry guarantee for 10 years against any leakage.	sqm	148.50			
14	ANTITERMITETREATMENT: Diluting and injecting chemical emulsion for POST-CONSTRUCTIONAL anti-termite treatment (excluding the cost of chemical emulsion) :					
a)	Along the external wall below concrete or masonry apron using chemical emulsion @ 2.25 litres per linear metre including drilling and plugging holes etc.: With Chlorpyriphos/ Lindane E.C. 20% with 1% concentration	metre	44			
b)	Treatment of soil under existing floors using chemical emulsion @ one litre per hole, 300 mm apart including drilling 12 mm diameter holes and plugging with cement mortar 1 :2 (1 cement : 2 Coarse sand) to match the existing floor: With Chlorpyriphos/Lindane E.C. 20% with 1% concentration	Sqm	212			
15	STEEL RAILING Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners , stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-incharge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.).	kg	245			
16	PLASTER OF PARIS & WALL PUTTY: Providing and applying plaster of paris putty of 2 mm thickness over plastered surface to prepare the surface even and smooth complete.	Sqm	2736			
17	EXTERIOR PAINTS: Finishing walls with Acrylic Smooth exterior paint of required shade : New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm)	Sqm	1131			
18	ALUMINIUM FITTINGS:					
18.1	Providing and fixing aluminium sliding door bolts, ISI marked anodised (anodic coating not less than grade AC 10 as per IS : 1868), transparent or dyed to required colour or shade, with nuts and screws etc. complete : 300x16 mm	Each	37			
18.2	Providing and fixing aluminium tower bolts, ISI marked, anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade, with necessary screws etc. complete : 250x10 mm	Each	74			
18.3	Providing and fixing aluminium handles, ISI marked, anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade, with necessary screws etc. complete : 125 mm	Each	74			
19	SANITARY WORKS					
19.1	Providing and fixing water closet squatting pan	each	6			

D. STAFF QUARTER

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	(Indian type W.C.pan) with 100 mm sand cast Iron P or S trap, 10 litre low level white P.V.C. flushing cistern, including flush pipe, with manually controlled device (handle lever) conforming to IS : 7231, with all fittings and fixtures complete, including cutting and making good the walls and floors wherever required: White Vitreous china Orissa pattern W.C. pan of size 580x440 mm with integral type foot rests					
19.2	Providing and fixing vitreous china dual purpose closet suitable for use as squatting pan or European type water closet (Anglo Indian W.C pan) with seat & lid fixed with C.P. brass hinges and rubber buffers, 10 litre low level flushing cistern with fitting and brackets, 40 mm flush bend, 20 mm over flow pipe, with specials of standard make and mosquito proof coupling of approved municipal design complete, including painting of fittings and brackets, cutting and making good the walls and floors wherever required: White vitreous china dual purpose WC pan with white solid plastic seat and lid with white vitreous china flushing cistern and C.P. flush bend.	each	6			
19.3	Providing and fixing floor mounted, white vitreous china single piece, double traps syphonic water closet of approved brand/make, shape, size and pattern including integrated white vitreous china cistern of capacity 10 litres with dual flushing system, including all fittings and fixtures with seat cover, cistern fittings, nuts, bolts and gasket etc including making connection with the existing P/S trap, complete in all respect as per directions of Engineer-in-Charge.	each	14			
19.4	Providing & fixing white vitreous china water less urinal of size 600 x 330 x 315 mm having antibacterial /germs free ceramic surface, fixed with cartridge having debris catcher and hygiene seal.	each	2			
19.5	Providing and fixing white vitreous china squatting plate urinal with integral rim longitudinal flush pipe.	each	1			
19.6	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS:13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required : Kitchen sink with drain board 510x1040 mm bowl depth 225 mm each	each	6			
19.7	Providing and fixing 600x450 mm beveled edge mirror of superior glass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete. each	each	6			
19.8	Providing and fixing 600x120x5 mm glass shelf with edges round off, supported on anodised aluminium angle frame with C.P. brass brackets and guard rail complete fixed with 40 mm long screws, rawl plugs etc., complete.	each	6			
19.9	Providing and fixing PTMT liquid soap container 109 mm wide, 125 mm high and 112 mm distance from wall of standard shape with bracket of the same materials with snap fittings of approved quality and colour, weighing not less than 105 gms.	each	6			
19.10	Providing and fixing PTMT towel rail complete with brackets fixed to wooden cleats with CP brass screws with concealed fittings arrangement of approved quality and colour: 600 mm long towel rail with total length of 645 mm, width 78 mm and effective height of 88 mm, weighing not less than 190 gms.	each	6			
19.11	Providing and fixing PTMT Waste Coupling for wash basin and sink, of approved quality and colour: Waste coupling 38 mm dia of 83 mm length and 77mm breadth, weighing not less than 60 gms.	each	12			

D. STAFF QUARTER

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
19.12	Providing and fixing PTMT Bottle Trap for Wash basin and sink: Bottle trap 31mm single piece moulded with height of 270 mm, effective length of tail pipe 260 mm from the centre of the waste coupling, 77 mm breadth with 25 mm minimum water seal, weighing not less than 260 gms	each	6			
20	CPVC PIPES					
20.1	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge: Internal work - Exposed on wall					
	40 mm nominal dia Pipes	meter	35			
	50 mm nominal dia Pipes	meter	15			
20.2	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. Concealed work, including cutting chases and making good the walls etc.					
	15 mm nominal dia Pipes.	meter	38			
	20 mm nominal dia Pipes	meter	10			
21	BIB COCK: Providing and fixing C.P. brass long nose bib cock of approved quality conforming to IS standards and weighing not less than 810 gms: 15 mm nominal bore	each	12			
22	STOP COCK					
22.1	Providing and fixing brass stop cock of approved quality:					
	15 mm nominal bore	each	18			
	20 mm nominal bore	each	6			
22.2	Providing and fixing PTMT pillar cock of approved quality and colour: 15 mm nominal bore, 125 mm long foam flow, weighing not less than 120 gms	each	6			
23	WATER TANK: Providing and placing on terrace (at all floor levels) polyethylene water storage tank, IS : 12701 marked, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	per litre	4000			
24	STEEL WORK					
24.1	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required: In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works	Kg	150			
24.2	Neat cement punning.	sqm	10			
24.3	Providing gola 75x75 mm in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 10 mm and down gauge), including finishing with cement mortar 1:3 (1 cement : 3 fine sand) as per standard design : In 75x75 mm deep chase	meter	55			
24.4	Making khurras 45x45 cm with average minimum thickness of 5 cm cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) over P.V.C. sheet 1 m x1 m x 400 micron, finished with 12 mm cement plaster 1:3 (1 cement : 3	each	4.00			

D. STAFF QUARTER

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	coarse sand) and a coat of neat cement, rounding the edges and making and finishing the outlet complete.					
24.5	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams.	each	4.00			
24.6	Wall painting with premium acrylic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour: Two coats	sqm	1605			
24.7	Wall painting with premium acrylic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour: Two coats	sqm	395			
24.8	Applying priming coats with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound) content.					
	With ready mixed pink or grey primer on wood work (hard and soft wood) having VOC content less than 50 grams/ litre	sqm	103			
	With water thinnable cement primer on wall surface having VOC content less than 50 grams/litre sqm	sqm	290			
25	ROOF TREATMENT: Grading roof for water proofing treatment with					
	Cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size)	cum	11.15			
	Cement mortar 1:3 (1 cement : 3 coarse sand)	cum	2.25			
26	BLOCKBOARD SHUTTERS: Providing and fixing ISI marked flush door shutters conforming to IS :2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters: 30 mm thick including ISI marked Stainless Steel butt hinges with necessary screws	sqm	51.50			
27	GRILL: Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete: Fixed to openings /wooden frames with rawl plugs screws etc.	kg	1905.00			
28	EARTHWORK IN EXCAVATION: Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge: All kinds of soil	Cum	9.301			
29	PLAIN CEMENT CONCRETE WORKS: Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size)	Cum	2.355			
30	REINFORCED CEMENT CONCRETE WORKS					
30.1	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size)	Cum	0.016			
30.2	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills,					

D. STAFF QUARTER

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement with 1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	0.776			
31	FORMWORK: Centering and shuttering including strutting, propping etc. and removal of form for :					
31.1	Foundations, footings, bases of columns, etc. for mass concrete	Sqm	2.344			
31.2	Lintels, beams, plinth beams, girders, bressumers and cantilevers	Sqm	0.374			
32	REINFORCEMENT: Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level: Thermo-Mechanically Treated bars of grade Fe- 500D or more.	kg	380.380			
33	MASONARYWORK					
33.1	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:4 (1 cement : 4 coarse sand)	Cum	4.855			
33.2	Half brick masonry with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundations and plinth in : Cement mortar 1:4 (1 cement : 4 coarse sand)	Sqm	19.654			
34	CEMENT PLASTERING					
34.1	15 mm cement plaster on the rough side of single or half brick wall of mix : 1:4 (1 cement: 4 fine sand)	Sqm	40.966			
34.2	12 mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	Sqm	5.027			
34.3	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings This includes jointing of pipes & fittings with one step CPVC solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in Charge: 100 mm nominal dia Pipes	rm	7.50			
35	MANHOLE COVER					
35.1	Providing and fixing in position pre-cast R.C.C. manhole cover and frame of required shape and approved quality, L D- 2.5: Circular shape 450 mm internal diameter	Each	2.00			
35.2	Making soak pit 2.5 m diameter 3.0 metre deep with 45 x 45 cm dry brick honey comb shaft with bricks and S.W. drain pipe 100 mm diameter, 1.8 m long complete as per standard design: With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	Each	1.00			
35.3	Constructing brick masonry chamber for underground C.I. inspection chamber and bends with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg), R.C.C. top slab with 1:1.5:3 mix (1 cement : 1.5 fine sand : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design: Inside dimension 455X610mm and 45 cm deep for single pipe line: With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	Each	4.00			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

E. INTERNAL ELECTRIFICATION (STAFF QUARTER)						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
(A) SCHEDULE ITEMS						
1	WIRING					
1.1	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.					
	Group A	Each	32			
	Group B	Each	42			
	Group C	Each	34			
1.2	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with piano type switch, phenolic laminated sheet, suitable size MS box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.					
	Group A	Point	6			
	5/6 amps switch	Each	6			
	3 pin 5/6 A socket outlet	Each	6			
1.3	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.					
	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	Meter	90			
	15/16 A switch	Each	6			
	6 pin 15/16 A socket outlet	Each	6			
1.4	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.					
	2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	RM	700			
	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	RM	50			
	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	RM	20			
	4 X 10 sq. mm + 2 X 6 sq. mm earth wire	RM	250			
1.5	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with piano type switch, phenolic laminated sheet, suitable size MS box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.					
	Group A	Point	30			
	5/6 amps switch	Each	30			
2	FITTINGS AND ACCESSORIES					
2.1	Installation, testing and commissioning of ceiling fan, including wiring the down rods of standard length (upto 30 cm) with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable, including providing and fixing phenolic laminated sheet cover on the fan box etc. as required.	Each	18.00			
2.2	Supplying and fixing stiff pendent with 300 mm long, 20 mm dia X 1.6 mm thick steel conduit, aluminium cast back plate and brass holder complete, including wiring the down rod with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable and painting etc. as required.	Each	6.00			
3	MCB DB					
3.1	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required.					

E. INTERNAL ELECTRIFICATION (STAFF QUARTER)						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	(But without MCB/RCCB/Isolator)					
	8 way, Double door	Each	1			
	12 way, Double door	Each	6			
3.2	Supplying and fixing of following ways surface/ recess mounting, vertical type, 415 V, TPN MCB distribution board of sheet steel, dust protected, duly powder painted, inclusive of 200 A tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCBs (but without MCBs and incomer) as required . (Note : Vertical type MCB TPDB is normally used where 3 phase outlets are required.): 4 way (4 + 12), Double door Each	Each	4			
3.3	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.					
	Single pole	Each	50			
	Double pole	Each	1			
3.4	Supplying and fixing following rating, four pole, 415 V, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required: 40A	Each	6			
3.5	Supplying and fixing following rating, four pole, (three phase and neutral), 415 volts, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required: 40A	Each	6			
4	EARTHING					
4.1	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	Each	3			
4.2	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	Set	2			
4.3	Supplying and laying 6 SWG G.I. wire at 0.50 metre below ground level for conductor earth electrode, including connection/ termination with GI thimble etc. as required.	Metre	50			
4.4	Supplying and laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of brass nut bolt & spring washer spaced at 50mm)	Metre	40			
4.5	Providing and fixing of lightning conductor finial, made of 25 mm dia 300 mm long, G.I. tube, having single prong at top, with 85 mm dia 6 mm thick G.I. base plate including holes etc. complete as required.	Each	1			
4.6	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required. (For vertical run)	Metre	75			
(B) NON SCHEDULE ITEMS						
5	LUMINARIES					
5.1	20 watt LED striplite luminaries with fitting	each	24			
5.2	LED skirting light	each	6			
6	CEILING FANS, EXHAUST FANS AND AIR CURTAINS					
6.1	Supplying, fitting, fixing 1200mm sweep premium model A.C ceiling fan.	each	18			
6.2	Supplying, fitting, fixing Ventil Air DB 300mm sweep A.C exhaust fan.	each	12			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

F. SECURITY BARRACK

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
1	PILING WORK: Boring with hydraulic piling rigs with power units, providing and installing cast in situ single under reamed piles of specified diameter and length below pile cap in M-25 cement concrete, to carry a safe working load not less than specified, excluding the cost of steel reinforcement but including the cost of boring with bentonite solution and the length of the pile to be embedded in pile cap etc. all complete. (Length of pile for payment shall be measured upto to the bottom of pile cap) : 400 mm dia piles	rm	1089			
2	STEEL REINFORCEMENT: Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. dismantling of test cap after test etc. complete: Thermo-Mechanically Treated bars of grade Fe- 500D or more.	Kg	90360			
3	DISMANTLING AND DEMOLISHING: Demolishing cement concrete manually/ by mechanical means including disposal of material within 50 metres lead as per direction of Engineer - in - charge: Nominal concrete 1:3:6 or richer mix (i/c equivalent design mix)	Cum	13			
4	PILE TEST: Vertical load testing of piles in accordance with IS 2911 (Part IV) including installation of loading platform by Kentledge/Anchor piles method and preparation of pile head or construction of test cap and dismantling of test cap after test etc. complete as per specification & the direction of Engineer in-charge. Note: 1. Initial and Routine Load Test shall not be carried out by Dynamic method of testing. Note: 2. Testing agency shall submit the design of loading platform for the approval of Engineer-in-charge.					
	Single pile above 50 tonne and upto 100 tonne Safe capacity					
	Initial test (Test Load 2.5 times the Safe capacity)	Per test	1			
	Routine test (Test Load 1.5 times the Safe capacity)	Per test	2			
	Integrity testing of Pile using Low Strain/ Sonic Integrity Test/ Sonic Echo Test method in accordance with IS 14893 including surface preparation of pile top by removing soil, mud, dust & chipping lean concrete lumps etc. and use of computerised equipment and high skill trained personal for conducting the test & submission of results, all complete as per direction of Engineer-in-charge.	Per test	55			
5	EARTHWORK					
5.1	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge: All kinds of soil	cum	120			
5.2	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	cum	44.50			
6	CONCRETE WORKS					
6.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources)	cum	15			

F. SECURITY BARRACK

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
6.2	1:5:10 (1 cement : 5 coarse sand (zone-III) derived from natural sources : 10 graded stone aggregate 40 mm nominal size derived from natural sources)	cum	35			
6.3	Providing and laying damp-proof course 40mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 12.5mm nominal size derived from natural sources)	sqm	5			
7	REINFORCED CEMENT CONCRETE WORK					
	FORM WORK					
7.1	Centring and shuttering including strutting,propping etc. and removal of form for					
a)	Foundations, footings, bases of columns etc. for mass concrete.	sqm	145			
b)	Suspended floors, roots, landings, balconies and access platform.	sqm	1338			
c)	Stairs, (excluding landings) except spiral-staircases	sqm	75			
d)	Lintels, beams, plinth bams, griders, bressumers and cantilevers.	sqm	1235			
e)	Columns,Pillars, Piers, Abutments, Posts and Struts	sqm	665			
f)	Extra for shuttering in circular work (20% of respective centering and shuttering items)	sqm	107			
g)	Walls (any thickness) including attached pilasters, butteresses,plinth and string courses etc.	sqm	750			
7.2	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in- charge; for the following grades of concrete. Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement.					
	All works upto plinth level: Concrete of M25 grade with minimum cement content of 330 kg/cum	cum	67			
	All works above plinth level upto floor V level: Concrete of M25 grade with minimum cement content of 330 kg/cum	cum	367			
7.3	Extra for R.C.C./ B.M.C/ R.M.C. work above floor V level for each four floors or part thereof.	cum	21			
8	BRICKWORK					
8.1	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:6 (1 cement : 6 coarse sand)	cum	14.50			
	HALF BRICK MASONRY					
8.2	Half brick masonry with non modular fly ash bricks of class designation 10, conforming to IS : 12894, in super structure above plinth and upto floor V level: Cement mortar 1:4 (1 cement :4 coarse sand)	Sqm	1380			
9	FLOORING					
9.1	Cement concrete flooring 1:2:4 (1 cement : 2 coarse sand :4 gradedstone aggregate) finished with a floating coat of neat cement, including cement slurry, but excluding the cost of nosing of steps etc. complete: 40 mm thick with 20 mm nominal size stone aggregate	Sqm	542			
9.2	Cement plaster skirting up to 30 cm height, with cement mortar 1:3 (1 cement : 3 coarse sand), finished with a	Sqm	80			

F. SECURITY BARRACK

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	floating coat of neat cement: 18 mm thick					
10	TILES					
10.1	Providing and laying rectified Glazed Ceramic floor tiles of size 300x300 mm or more (thickness to be specified by the manufacturer), of 1st quality conforming to IS : 15622, of approved make, in colours White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement: 4 Coarse sand), jointing with grey cement slurry @ 3.3 kg/ sqm including grouting the joints with white cement and matching pigments etc., complete.	Sqm	97			
10.2	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in- Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	Sqm	98			
10.3	Providing and laying 60mm thick factory made cement concrete interlocking paver block of M -30 grade made by block making machine with strong vibratory compaction, of approved size, design & shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand, filling the joints with line sand etc. all complete as per the direction of Engineer-in-charge.	Sqm	130			
11	FINISHING WORK					
11.1	12mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	Sqm	5560			
11.2	15 mm cement plaster on the rough side of single or half brick wall of mix : 1:6 (1 cement : 6 fine sand)	Sqm	1380			
12	ROOF TREATMENT:					
	Grading roof for water proofing treatment with Cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size)	Cum	13			
	Cement mortar 1:3 (1 cement : 3 coarse sand)	Cum	3			
13	CUPBOARD SHUTTERS:					
	Providing and fixing ISI marked flush door shutters conforming to IS :2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters: 30 mm thick including ISI marked Stainless Steel butt hinges with necessary screws	Sqm	118			
14	DOOR FRAMES:					
	Providing and fixing pressed steel door frames conforming to IS: 4351, manufactured from commercial mild steel sheet of 1.60 mm thickness, including hinges, jamb, lock jamb, bead and if required angle threshold of mild steel angle of section 50x25 mm, or base ties of 1.60 mm, pressed mild steel welded or rigidly fixed together by mechanical means, including M.S. pressed butt hinges 2.5 mm thick with mortar guards, lock strike- plate and shock absorbers as specified and applying a coat of approved steel primer after pre-treatment of the surface as directed by Engineer-in-charge: Profile B- Fixing with adjustable lugs with split end tail to each jamb	rm	141			
15	BLOCK BOARD SHUTTERS:					
	Providing and fixing ISI marked flush door shutters conforming to IS :2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both	Sqm	59			

F. SECURITY BARRACK

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	faces of shutters: 30 mm thick including ISI marked Stainless Steel butt hinges with necessary screws					
16	GRILL: Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete: Fixed to openings /wooden frames with rawl plugs screws etc.	Kg	4375			
17	PVC DOOR & FRAMES					
17.1	Providing and fixing PVC Door Frame of size 50x47 mm with a wall thickness of 5 mm (\pm 0.2 mm), made out of single piece extruded PVC profile, with mitred cut joints and joint with 2 nos of PVC bracket of size 190 mm x 100 mm long arms of cross section size 35 x 15 mm & self driven self tapping screws, the vertical door profiles to be reinforced with 40x20 mm M.S. rectangular tube of 0.8 mm, including providing EPDM rubber gasket weather seal throughout the frame, including jointing 5 mm PVC frame strip with PVC solvent cement on the back of the profile. The door frame to be fixed to the wall using 8 x100 mm long anchor fasteners complete, all as per manufacturer's specification and direction of Engineer - in- charge.	R.M.	80.00			
17.2	Providing and fixing to existing door frames. 24 mm thick factory made PVC door shutters made of styles and rails of a uPVC hollow section of size 59x24 mm and wall thickness 2 mm (\pm 0.2 mm) with inbuilt edging on both sides. The styles and rails mitred and joint at the corners by means of M.S. galvanised/ plastic brackets of size 75x220 mm having wall thickness 1.0 mm and stainless steel screws. The styles of the shutter reinforced by inserting galvanised M.S. tube of size 20x20 mm and 1 mm (\pm 0.1 mm) wall thickness. The lock rail made up of 'H' section, a uPVC hollow section of size 100x24 mm and 2 mm (\pm 0.2 mm) wall thickness, fixed to the shutter styles by means of plastic/galvanised M.S. 'U' cleats. The shutter frame filled with a uPVC multi-chambered single panel of size not less than 620 mm, having over all thickness of 20 mm and 1 mm (\pm 0.1 mm) wall thickness. The panels filled vertically and tie bar at two places by inserting horizontally 6 mm galvanised M.S. rod and fastened with nuts and washers, complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).	Sqm	27.00			
18	PLINTH PROTECTION WORK: Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources) over 75mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including necessary excavation, levelling & dressing & finishing the top smooth.	sqm	49			
19	WATER PROOFING: Providing and applying integral crystalline (dry shake) of hydrophilic in nature for waterproofing treatment to the RCC structures like basement raft, foundation slab, sewage & water treatment plant slab, warehouses floor, parking structures and water tank base slab etc. sprinkled @0.60kg per sqm or higher as recommended by the manufacturer's specification over the lean concrete of above cited structures. The material shall meet the requirements as specified in ACI-212-3R-2010 i.e. by reducing permeability of concrete by more than 85%, compared control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline dryshake shall be capable of self-	sqm	169			

F. SECURITY BARRACK

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the Engineer- in-charge. The product performance shall carry guarantee for 10 years against any leakage.					
20	Diluting and injecting chemical emulsion for POST CONSTRUCTIONAL anti-termite treatment (excluding the cost of chemical emulsion) : Along the external wall below concrete or masonry apron using chemical emulsion @ 2.25 litres per linear metre including drilling and plugging holes With Chlorpyriphos/ Lindane E.C. 20% with 1% concentration	Metre	60.50			
	Treatment of soil under existing floors using chemical emulsion @ one litre per hole, 300 mm apart including drilling 12 mm diameter holes and plugging with cement mortar 1 :2 (1 cement : 2 Coarse sand) to match the existing floor: With Chlorpyriphos/Lindane E.C. 20% with 1% concentration	Sqm	264			
21	STEEL RAILING: Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners , stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-incharge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.).	Kg	332			
22	CEMENT PAINT AND PRIMER: Finishing walls with water proofing cement paint of required shade : New work (Two or more coats applied @ 3.84 kg/10 sqm)	Sqm	6940			
23	PLASTER OF PARIS & WALL PUTTY: Providing and applying plaster of paris putty of 2 mm thickness over plastered surface to prepare the surface even and smooth complete.	Sqm	6940.00			
24	EXTERIOR PAINTS: Finishing walls with Acrylic Smooth exterior paint of required shade : New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm)	Sqm	2275			
25	ALUMINIUMWORK					
25.1	Providing and fixing aluminium sliding door bolts, ISI marked anodised (anodic coating not less than grade AC 10 as per IS : 1868), transparent or dyed to required colour or shade, with nuts and screws etc. complete : 300x16 mm	Each	48			
25.2	Providing and fixing aluminium tower bolts, ISI marked, anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade, with necessary screws etc. complete : 250x10 mm	Each	72			
25.3	Providing and fixing aluminium handles, ISI marked, anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade, with necessary screws etc. complete : 125 mm	Each	72			
25.4	Providing and fixing special quality chromium plated brass cupboard locks with six levers of approved quality including necessary screws etc. complete: Size 50 mm	Each	52			
25.5	Providing and fixing 50 mm bright finished brass cupboard or wardrobe knob of approved quality with necessary screws.	Each	52			
25.6	Providing and fixing bright finished brass hanging type floor door stopper with necessary screws, etc. complete.	Each	8			

F. SECURITY BARRACK

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
25.7	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, paneling and dash fasteners to be paid for separately) : For fixed portion: Polyester powder coated aluminium (minimum thickness of polyester powder coating 50 micron)	kg	2208			
26	SANITARY WORKS:					
26.1	Providing and fixing water closet squatting pan (Indian type W.C.pan) with 100 mm sand cast Iron P or S trap, 10 litre low level white P.V.C. flushing cistern, including flush pipe, with manually controlled device (handle lever) conforming to IS : 7231, with all fittings & fixtures complete, including cutting and making good the walls and White Vitreous china Orissa pattern W.C. pan of size 580x440 mm with integral type foot rests	each	8			
26.2	Providing & fixing white vitreous china water less urinal of size 600 x 330 x 315 mm having antibacterial /germs free ceramic surface, fixed with cartridge having debris catcher and hygiene seal.	each	6			
26.3	Providing and fixing white vitreous china squatting plate urinal with integral rim longitudinal flush pipe.	each	6			
26.4	Providing and fixing wash basin with C.I. brackets, 15 mm C.P. brass pillar taps, 32 mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require: White Vitreous China Wash basin size 550x400 mm with a pair of 15 mm C.P. brass pillar taps	each	12			
26.5	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS:13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required: Kitchen sink with drain board-510x1040 mm bowl depth 225 mm each	each	4			
26.6	Providing and fixing 600x450 mm beveled edge mirror of superiorglass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete.each	each	12			
26.7	Providing and fixing 600x120x5 mm glass shelf with edges round off, supported on anodised aluminium angle frame with C.P. brass brackets and guard rail complete fixed with 40 mm long screws, rawl plugs etc., complete.	each	12			
26.8	Providing and fixing PTMT liquid soap container 109 mm wide, 125 mm high and 112 mm distance from wall of standard shape with bracket of the same materials with snap fittings of approved quality and colour, weighing not less than 105 gms.	each	28			
26.9	Providing and fixing PTMT towel rail complete with brackets fixed to wooden cleats with CP brass screws with concealed fittings arrangement of approved quality and colour: 600 mm long towel rail with total length of 645 mm, width 78 mm and effective beveled height of 88 mm, weighing not less than 190 gms.	each	12			
26.10	Providing and fixing PTMT Waste Coupling for wash basin and sink, of approved quality and colour: Waste coupling 38 mm dia of 83 mm length and 77mm	each	16			

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Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	breadth, weighing not less than 60 gms.					
26.11	Providing and fixing PTMT Bottle Trap for Wash basin and sink. Bottle trap 31mm single piece moulded with height of 270 mm, effective length of tail pipe 260 mm from the centre of the waste coupling, 77 mm breadth with 25 mm minimum water seal, weighing not less than 260 gms	each	16			
27	PVC PIPES, BENDS, JUNCTIONS, TEES, ETC.					
27.1	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall					
	32 mm nominal dia Pipes	metre	58			
	40 mm nominal dia Pipes	metre	45			
27.2	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge.					
	Concealed work, including cutting chases and making good the walls etc.	metre	35			
	25 mm nominal dia Pipes	metre	20			
28	SOAK PIT AND INSPECTION CHAMBER:					
	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) , i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design: With common burnt clay F.P.S.(non modular) bricks of class designation 7.5	each	4			
29	GRATING:					
	Providing and fixing PTMT grating of approved quality & colour. Rectangular type with openable circular lid 150 mm nominal size square 100 mm diameter of the inner hinged round grating	each	24			
30	C.P.V.C PIPES					
30.1	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall					
	40 mm nominal dia Pipes	metre	55			
	50 mm nominal dia Pipes	metre	35			
30.2	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge.					

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				In Figures	In Words	
	Concealed work, including cutting chases and making good the walls etc.					
	15 mm nominal dia Pipes	metre	55.00			
	20 mm nominal dia Pipes	metre	30.00			
31	BIB COCK: Providing and fixing C.P. brass long nose bib cock of approved quality conforming to IS standards and weighing not less than 810 gms. 15 mm nominal bore	each	24.00			
32	STOP COCK: Providing and fixing brass stop cock of approved quality:					
	15 mm nominal bore	each	26			
	20 mm nominal bore	each	4			
33	PILLAR COCK: Providing and fixing PTMT pillar cock of approved quality and colour. 15 mm nominal bore, 125 mm long foam flow, weighing not less than 120 gms	each	16			
34	WATER TANK: Providing and placing on terrace (at all floor levels) polyethylene water storage tank, IS : 12701 marked, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	per litre	9000			
35	STEEL WORK					
35.1	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required. In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works	Kg	200			
35.2	Neat cement punning.	sqm	15			
35.3	Providing gola 75x75 mm in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 10 mm and down gauge), including finishing with cement mortar 1:3 (1 cement : 3 fine sand) as per standard design : In 75x75 mm deep chase	meter	64			
35.4	Making khurras 45x45 cm with average minimum thickness of 5 cm cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) over P.V.C. sheet 1 m x1 m x 400 micron, finished with 12 mm cement plaster 1:3 (1 cement : 3 coarse sand) and a coat of neat cement, rounding the edges and making and finishing the outlet complete.	each	4			
35.5	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams.	each	4			
35.6	Wall painting with premium acrylic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour: Two coats	sqm	4665			
35.7	Wall painting with premium acrylic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour: Two coats	sqm	1013			
35.8	Applying priming coats with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound) content.					
	With ready mixed pink or grey primer on wood work (hard and soft wood) having VOC content less than 50 grams/litre	sqm	354			
	With water thinnable cement primer on wall surface having VOC content less than 50 grams/litre sqm	sqm	659			
	EARTHWORK IN EXCAVATION					

F. SECURITY BARRACK

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
36	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge. All kinds of soil	Cum	9.301			
37	PLAIN CEMENT CONCRETE WORKS: Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size)	Cum	2.355			
38	REINFORCED CEMENT CONCRETE WORKS: Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size)	Cum	0.016			
	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement with 1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	0.776			
39	FORMWORK: Centering and shuttering including strutting, propping etc. and removal of form for :					
	Foundations, footings, bases of columns, etc. for mass concrete	Sqm	2.344			
	Lintels, beams, plinth beams, girders, bressumers and cantilevers	Sqm	0.374			
40	REINFORCEMENT: Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Thermo-Mechanically Treated bars of grade Fe- 500D or more.	kg	380.380			
41	MASONRYWORK					
	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:4 (1 cement : 4 coarse sand)	Cum	4.855			
	Half brick masonry with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundations and plinth in : Cement mortar 1:4 (1 cement : 4 coarse sand)	Sqm	19.654			
42	CEMENT PLASTERING					
	15 mm cement plaster on the rough side of single or half brick wall of mix : 1:4 (1 cement: 4 fine sand)	Sqm	40.966			
	12 mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	Sqm	5.027			
	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings This includes jointing of pipes & fittings with one step CPVC solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in Charge: 100 mm nominal dia Pipes	Rm	7.50			
43	MANHOLE COVER:					
	Providing and fixing in position pre-cast R.C.C. manhole cover and frame of required shape and approved quality: L D- 2.5: Circular shape 450 mm internal diameter	Each	2			
	Making soak pit 2.5 m diameter 3.0 metre deep with 45 x 45 cm dry brick honey comb shaft with bricks and S.W. drain pipe 100 mm diameter, 1.8 m long complete as per	Each	1			

F. SECURITY BARRACK

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	standard design: With common burnt clay F.P.S. (non modular) bricks of class designation 7.5					
	Constructing brick masonry chamber for underground C.I. inspection chamber and bends with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg), R.C.C. top slab with 1:1.5:3 mix (1 cement : 1.5 fine sand : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design: Inside dimension 455X610mm and 45 cm deep for single pipe line: With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	Each	4			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

G. INTERNAL ELECTRIFICATION (SECURITY BARRACK)						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
(A) SCHEDULE ITEM:						
1	WIRING:					
1.1	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, with piano type switch, phenolic laminated sheet, suitable size M.S. box and earthing the point with 1.5 sq.mm. FRLS PVC insulated copper conductor single core cable etc. as required.					
	Group A	Point	55			
	Group B	Point	72			
	Group C	Point	55			
1.2	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.					
	2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	RM	24			
		RM	40			
	3 pin 5/6 A socket outlet	Each	8			
	5/6 amps switch	Each	8			
1.3	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.					
	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	RM	75			
		RM	40			
	6 pin 15/16 A socket outlet	Each	7			
	15/16 A switch	Each	7			
1.4	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.					
	2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	RM	1000			
	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	RM	100			
	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	RM	25			
	2 X 10 sq. mm + 1 X 6 sq. mm earth wire	RM	250			
	4 X 10 sq. mm + 2 X 6 sq. mm earth wire	RM	40			
1.5	Supplying and drawing following pair 0.5 mm dia FRLS PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC conduit as Required: 2 Pair	Metre	250			
1.6	Supplying and drawing co-axial TV cable RG-6 grade, 0.7 mm solid copper conductor PE insulated, shielded with fine tinned copper braid and protected with PVC sheath in the existing surface/ recessed steel/ PVC conduit as required.	Metre	120			
2	FITTINGSANDACCESSORIES					
2.1	Installation, testing and commissioning of ceiling fan, including wiring the down rods of standard length (upto 30 cm) with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable, including providing and fixing phenolic laminated sheet cover on the fan box etc. as required.	Each	37			
2.2	Supplying and fixing stiff pendent with 300 mm long, 20 mm dia X 1.6 mm thick steel conduit, aluminium cast back plate and brass holder complete, including wiring the down rod with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable and painting etc. as required.	Each	36			
3	MCB DB					
3.1	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required.					

G. INTERNAL ELECTRIFICATION (SECURITY BARRACK)						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	(But without MCB/RCCB/Isolator)					
	8 way, Double door	Each	1			
	12 way, Double door	Each	7			
3.2	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.					
	Single pole	Each	58			
	Double pole	Each	1			
3.3	Supplying and fixing following rating, double pole, 240 V, isolator in existing MCB DB complete with connections, testing & commissioning etc. as required: 40A	Each	7			
3.4	Supplying & fixing following rating, four pole, 415 V, isolator in existing MCB DB complete with connections, testing & commissioning etc. as required: 40A	Each	1			
3.5	Supplying and fixing following rating, four pole, (three phase and neutral), 415 volts, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required: 40A	Each	7			
4	EARTHING					
4.1	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	Each	4			
4.2	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	Set	2			
4.3	Supplying and laying 6 SWG G.I. wire at 0.50 metre below ground level for conductor earth electrode, including connection/ termination with GI thimble etc. as required.	Metre	100			
4.4	Supplying and laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of brass nut bolt & spring washer spaced at 50mm)	Metre	40			
4.5	Supplying and laying 25 mm X 5 mm G.I. strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with G.I. nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm)	Metre	80			
4.6	Providing and fixing of lightning conductor finial, made of 25 mm dia 300 mm long, G.I. tube, having single prong at top, with 85 mm dia 6 mm thick G.I. base plate including holes etc. complete as required.	Each	2.00			
4.7	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required. (For vertical run)	Metre	150			
(B) NON SCHEDULE ITEMS						
5	LUMINAIRES					
5.1	20 watt LED striplite luminaries with fitting	each	46			
5.2	20 watt sleek box type luminaries with fittings complete	each	49			
6	CEILING FAN, EXHAUST FAN AND AIR CURTAINS					
6.1	Supplying, fitting, fixing 1200mm sweep premium model A.C ceiling fan.	each	37			
6.2	Supplying, fitting, fixing Ventil Air DB 300mm sweep A.C exhaust fan.	each	13			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

H. EXTERNAL ELECTRIFICATION (CAMPUS)						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
(A) SCHEDULE ITEMS:						
1	CIRCUITWIRING					
1.1	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with piano type switch, phenolic laminated sheet, suitable size MS box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.					
	Group A	Each	2			
	Group B	Each	2			
	Group C	Each	1			
1.2	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with piano type switch, phenolic laminated sheet, suitable size MS box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.					
	Group A	Point	1			
	5/6 amps switch	Each	1			
	3 pin 5/6 A socket outlet	Each	1			
1.3	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.					
	2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	Metre	25			
	2 X 10 sq. mm + 1 X 6 sq. mm earth wire	Metre	15			
1.4	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required: 20 mm	Metre	10			
1.5	Supplying and drawing co-axial TV cable RG-6 grade, 0.7 mm solid copper conductor PE insulated, shielded with fine tinned copper braid and protected with PVC sheath in the existing surface/ recessed steel/ PVC conduit as required.	Metre	250			
1.6	Supplying and drawing following pair 0.5 mm dia FRLS PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC conduit as required: 4 Pair	Metre	50			
2	FITTINGS AND ACCESSORIES					
2.1	Installation, testing and commissioning of ceiling fan, including wiring the down rods of standard length (upto 30 cm) with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable, including providing and fixing phenolic laminated sheet cover on the fan box etc. as required.	Each	1			
2.2	Supplying and fixing stiff pendent with 300 mm long, 20 mm dia X 1.6 mm thick steel conduit, aluminium cast back plate and brass holder complete, including wiring the down rod with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable and painting etc. as required.	Each	1			
3	MCB DB					
3.1	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator): 8 way, Double door	Each	1			
3.2	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for					

H. EXTERNAL ELECTRIFICATION (CAMPUS)						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.					
	Single pole	Each	4			
	Double pole	Each	1			
3.3	Supplying and fixing following rating, double pole, (single phase and neutral), 240 V, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required: 25 A	Each	1			
4	EARTHING					
4.1	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	Each	12			
4.2	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	Set	4			
4.3	Supplying and laying 6 SWG G.I. wire at 0.50 metre below ground level for conductor earth electrode, including connection/ termination with GI thimble etc. as required.	Metre	600			
4.4	Supplying and laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of brass nut bolt & spring washer spaced at 50mm)	Metre	60			
4.5	Supplying and laying 25 mm X 5 mm G.I. strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with G.I. nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm)	Metre	150			
(B) NONSCHEDULE ITEMS						
5	LUMINARIES: 20 watt LED striplite luminaries with fitting	each	1			
6	CEILING FANS, EXHAUST FANS AND AIR CURTAINS: Supplying, fitting, fixing 1200mm sweep premium model A.C ceiling fan.	each	1			
7	U.G CABLE AND CABLE WORKS					
8	MOTOR PUMP SET					
9	OCTAGONAL POLE					
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

I. ANCILLARY WORKS						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
1	EARTHWORK: Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge: All kinds of soil	cum	88			
2	CONCRETEWORKS: Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources)	cum	15			
3	BRICKWORK: Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:6 (1 cement : 6 coarse sand)	cum	22.50			
4	FINISHING WORK: 15 mm cement plaster on the rough side of single or half brick wall of mix : 1:6 (1 cement : 6 fine sand)	Sqm	304			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

J. SITE DEVELOPMENT WORKS, RAISING LOW SITE						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
1	CARRIAGE OF MATERIALS: Earth (Upto 5 km)	cum	4897.10			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

K. EXTERNAL WATER SUPPLY DISTRIBUTION NETWORK						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
1	EARTHWORK: Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge: All kinds of soil	cum	20			
2	CONCRETEWORKS: Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources)	cum	2			
3	REINFORCED CEMENT CONCRETE WORK					
	FORM WORK					
3.1	Centring and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete.	sqm	9			
3.2	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in- charge; for the following grades of concrete. Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement: All works upto plinth level- Concrete of M25 grade with minimum cement content of 330 kg/cum	cum	1			
4	BRICKWORK: Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:6 (1 cement : 6 coarse sand)	cum	1.50			
5	FINISHING WORK: 15 mm cement plaster on the rough side of single or half brick wall of mix : 1:6 (1 cement : 6 fine sand)	Sqm	26			
6	STEEL REINFORCEMENT: Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level.dismantling of test cap after test etc. complete: Thermo-Mechanically Treated bars of grade Fe- 500D or more.	Kg	45			
7	PIPING					
7.1	Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc.					
	External work					
	25 mm dia nominal bore	R.M	10			
	40 mm dia nominal bore	R.M	35			
	65 mm dia nominal bore	R.M	90			
	80 mm dia nominal bore	R.M	145			
7.2	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) :					
	25 mm nominal bore	each	2			
	40 mm nominal bore	each	2			
	65 mm nominal bore	each	6			
	80 mm nominal bore	each	6			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

L. GENERATOR SHED						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
1	EARTHWORK:					
1.1	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge: All kinds of soil	cum	30			
1.2	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	cum	15			
2	CONCRETEWORKS					
2.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources)	cum	2			
2.2	1:5:10 (1 cement : 5 coarse sand (zone-III) derived from natural sources : 10 graded stone aggregate 40 mm nominal size derived from natural sources)	cum	1.50			
2.3	Providing and laying damp-proof course 40mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 12.5mm nominal size derived from natural sources)	sqm	5.25			
3	REINFORCED CEMENT CONCRETE WORK					
	FORM WORK					
3.1	Centring and shuttering including strutting, propping etc. and removal of form for					
	Foundations, footings, bases of columns etc. for mass concrete.	sqm	23.50			
	Lintels, beams, plinth bams, griders, bressumers and cantilevers.	sqm	26.00			
	Columns, Pillars, Piers, Abutments, Posts and Struts	sqm	35.00			
	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.	sqm	18.00			
3.2	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland / Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement.					
	All works upto plinth level: Concrete of M25 grade with minimum cement content of 330 kg/cum	cum	6.30			
	All works above plinth level upto floor V level: Concrete of M25 grade with minimum cement content of 330 kg/cum	cum	4			
4	BRICKWORK					
4.1	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:6 (1 cement : 6 coarse sand)	cum	15			

L. GENERATOR SHED						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
4.2	Half brick masonry with non modular fly ash bricks of class designation 10, conforming to IS : 12894, in super structure above plinth and upto floor V level: Cement mortar 1:4 (1 cement :4 coarse sand)	Sqm	39			
5	FLOORING					
5.1	Cement concrete flooring 1:2:4 (1 cement : 2 coarse sand :4 gradedstone aggregate) finished with a floating coat of neat cement, including cement slurry, but excluding the cost of nosing of steps etc. complete: 40 mm thick with 20 mm nominal size stone aggregate	Sqm	24			
5.2	Cement plaster skirting up to 30 cm height, with cement mortar 1:3 (1 cement : 3 coarse sand), finished with a floating coat of neat cement: 18 mm thick	Sqm	3.60			
6	FINISHING WORK					
6.1	12mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	Sqm	112.60			
6.2	15 mm cement plaster on the rough side of single or half brick wall of mix : 1:6 (1 cement : 6 fine sand)	Sqm	39			
6.3	Neat cement punning.	Sqm	25.76			
7	GRILL: Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete: Fixed to openings /wooden frames with rawl plugs screws etc.	Kg	513			
8	DISTEMPERING: Distempering with 1st quality acrylic distemper, having VOC (Volatile Organic Compound) content less than 50 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required, to achieve even shade and colour: One coat	Sqm	37.80			
9	CEMENT PAINT AND PRIMER: Finishing walls with water proofing cement paint of required shade : New work (Two or more coats applied @ 3.84 kg/10 sqm)	Sqm	112.60			
10	PLASTER OF PARIS & WALL PUTTY: Providing and applying plaster of paris putty of 2 mm thickness over plastered surface to prepare the surface even and smooth complete.	Sqm	112.60			
11	PAINTING ON STEEL AND OTHER METAL					
11.1	Applying priming coat: With ready mixed red oxide zinc chromate primer of approved brand and manufacture on steel galvanised iron/ steel works	Sqm	37			
11.2	Painting (two or more coats) on rain water, soil waste and vent pipes and fittings with synthetic enamel paint of approved brand and manufacture and required colour over a priming coat of approved steel primer on new work: 100 mm diameter pipes	metre	63			
12	EXTERIOR PAINTS: Finishing walls with Acrylic Smooth exterior paint of required shade : New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm)	Sqm	55			
13	STEEL REINFORCEMENT: Steel reinforcement for R.C.C. work including straightening, cutting,bending, placing in position and binding all complete upto plinth level.dismantling of test cap after test etc. complete: Thermo-Mechanically Treated bars of grade Fe- 500D or more.	Kg	1648			
14	ROOF TRUSS: Steel work in built up tubular (round, square or rectangular hollow tubes etc.) trusses etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete: Hot finished welded type tubes	kg	475			
15	ROLLING SHUTTERS:					

L. GENERATOR SHED

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	Supplying and fixing rolling shutters of approved make, made of required size M.S. laths, interlocked together through their entire length and jointed together at the end by end locks, mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking with push and pull operation complete, including the cost of providing and fixing necessary 27.5 cm long wire springs manufactured from high tensile steel wire of adequate strength conforming to IS: 4454 - part 1 and M.S. top cover of required thickness for rolling shutters: 80x1.25 mm M.S. laths with 1.25 mm thick top cover	sqm	9			
16	ANTITERMITE TREATMENT: Diluting and injecting chemical emulsion for POST-CONSTRUCTIONAL anti-termite treatment (excluding the cost of chemical emulsion) :					
	Along the external wall below concrete or masonry apron using chemical emulsion @ 2.25 litres per linear metre including drilling and plugging holes etc.: With Chlorpyriphos/ Lindane E.C. 20% with 1% concentration	metre	31.60			
	Treatment of soil under existing floors using chemical emulsion @ one litre per hole, 300 mm apart including drilling 12 mm diameter holes and plugging with cement mortar 1 :2 (1 cement : 2 Coarse sand) to match the existing floor: With Chlorpyriphos/Lindane E.C. 20% with 1% concentration	Sqm	22			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

M. UG FIRE FIGHTING SUMP & PUMP HOUSE (CIVIL)						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
1	EARTHWORK: Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30cm in depth, 1.5m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth, lead up to 50m and lift up to 1.5m, as directed by Engineer-in-Charge: All kinds of soil.	Cum	162.86			
2	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	0.10			
3	ANTI-TERMITETREATMENT: Supplying chemical emulsion in sealed containers including delivery as specified. Chlorpyriphos/ Lindane emulsifiable concentrate of 20%	Sq.m	71.62			
4	Diluting and injecting chemical emulsion for POST-CONSTRUCTIONAL anti- termite treatment (excluding the cost of chemical emulsion) : Along external wall where the apron (existing) is not provided using chemical emulsion @ 7.5 litres / sqm of the vertical surface of the substructure to a depth of 300mm including excavation channel along the wall & rodding etc. complete: With Chlorpyriphos/ Lindane E.C. 20% with 1% concentration	Sq.m	21.46			
5	CONCRETE WORKS: Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources)	Cum	6.73			
6	Providing and laying damp-proof course 40mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand (Zone III) : 4 graded stone aggregate 12.5mm nominal size).	Cum	0.05			
7	Plain cement concrete floor base 50mm thick in prop 1:3:6 (1 cement: 3 sand : 6 coarse aggregate) laid in alternate bays as specified with coarse agg. of size 13mm to 32mm including dewatering if necessary, and curing etc. complete.	Sq.m	53.90			
8	Providing and laying damp-proof course 50mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 20mm nominal size derived from natural sources).	Sq.m	2.97			
9	REINFORCED CEMENT CONCRETE WORKS: Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size)	cum	58.61			
10	Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts etc. above plinth level up to floor five level, excluding cost of centering, shuttering, finishing and reinforcement : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) derived from natural sources : 3 graded stone aggregate 20 mm nominal size derived from natural sources)	cum	0.83			
11	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement with 1:1.5:3 (1	Cum	3.02			

M. UG FIRE FIGHTING SUMP & PUMP HOUSE (CIVIL)

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	cement : 1.5 coarse sand(zone-III) : 3 graded stone aggregate 20 mm nominal size derived from natural sources).					
12	FORMWORK:					
	Centering and shuttering including strutting, propping etc. and removal of form for : Columns, Pillars, Piers, Abutments, Posts and Struts	Sq.m	193.40			
	Columns, pillars, posts and struts Square, Rectangular, polygon in plan or any shape like Tee/L etc. having plane vertical face: Using 25 mm thick plank	Sq.m	15.60			
13	Centering and shuttering including strutting, propping etc. and removal of form for : Lintels, beams, plinth beams, girders, bressumers and cantilevers	Sq.m	46.73			
14	Centering and shuttering including strutting, propping etc. and removal of form for : Suspended floors, roofs, landings, balconies and access platform	Sq.m	45.98			
	Vertical surface such as walls (any thickness), parapet walls, partitions, walls of septic tank, inspection pit and the like including attached pilasters, buttresses, plinth and string courses and the like.	Sq.m	158.93			
15	REINFORCEMENT: Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level: Thermo-Mechanically Treated bars of grade Fe- 500D or more.	kg	8601.14			
16	MASONRYWORKS: Brick work with common burnt clay modular bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:4 (1 cement : 4 coarse sand)	Sq.m	68.73			
17	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in : Cement mortar 1:4 (1 cement : 4 coarse sand)	Cum	0.34			
18	HALF BRICK MASONRY: Half brick masonry with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level: Cement mortar 1:3 (1 cement :3 coarse sand)	Sq.m	67.14			
19	FLOORING: 52 mm thick cement concrete flooring with concrete hardener topping, under layer 40 mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) and top layer 12 mm thick cement hardener consisting of mix 1:2 (1 cement hardener mix : 2 graded stone aggregate 6 mm nominal size) by volume, hardening compound mixed @ 2 litre per 50 kg of cement or as per manufacturer's specifications. This includes cost of cement slurry, but excluding the cost of nosing of steps etc. complete.	Sq.m	60.33			
20	FINISHING:					
	15 mm cement plaster on the rough side of single or half brick wall of mix : 1:4 (1 cement: 4 fine sand)	Sq.m	124.63			
	20 mm thick, 1:4 (1 cement: 4 fine sand)	Sq.m	63.16			
	15 mm cement plaster on rough side of single or half brick wall of mix: 1:4 (1 cement: 4 coarse sand)	Sq.m	220.53			
21	DOORS/ WINDOWS & FITTINGS					
	Supplying and fixing rolling shutters of approved make, made of required size M.S. laths, interlocked together through their entire length and jointed together at the end by end locks, mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking with push and pull operation complete, including the cost of providing and fixing necessary 27.5 cm long wire springs manufactured from high tensile steel wire of dequate strength	Sq.m	2.88			

M. UG FIRE FIGHTING SUMP & PUMP HOUSE (CIVIL)

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	conforming to IS: 4454 - part 1 and M.S. top cover of required thickness for rolling shutters: 80x1.25 mm M.S. laths with 1.25 mm thick top cover					
	Providing and fixing factory made uPVC white colour sliding glazed window upto 1.50 m in height dimension comprising of uPVC multi-chambered frame with in-built roller track and sash extruded profiles duly reinforced with 1.60 ± 0.2 mm thick galvanized mild steel section made from roll forming process of required length (shape & size according to uPVC profile), appropriate dimension of uPVC extruded glazing beads and uPVC extruded interlocks, EPDM gasket, wool pile, zinc alloy (white powder coated) touch locks with hook, zinc alloy body with single nylon rollers (weight bearing capacity to be 40 kg), G.I fasteners 100 x 8 mm size for fixing frame to finished wall and necessary stainless steel screws etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners, including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished: Two track two panels sliding window made of (small series) frame 52 x 44 mm & sash 32 x 60 mm both having wall thickness of 1.9 ± 0.2 mm and single glazing bead of appropriate dimension. (Area of window upto 1.75 sqm)	Sq.m.	3			
	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete: Fixed to steel windows by welding	kg	64.32			
22	PLASTER OF PARIS & WALL PUTTY: Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	Sq.m	91.94			
23	EXTERIOR PAINTS / COATINGS: Finishing walls with 100% Premium acrylic emulsion paint having VOC less than 50 gm/liter and UV resistance as per IS 15489:2004, Alkali & fungal resistance, dirt resistance exterior paint of required shade (Company Depot Tinted) with silicon additives: New work (Two or more coats applied @ 1.43 litre/10 sqm. Over and including priming coat of exterior primer applied @ 0.90 litre/10 sqm.	Sq.m	91.94			
24	PAINTING ON STEEL AND OTHER METAL SURFACE: Applying priming coat : With ready mixed red oxide zinc chromate primer of approved brand and manufacture on steel work (second coat)	Rm	1205.27			
25	IRON & STEEL WORK					
	Steel work in built up tubular (round, square or rectangular hollow tubes etc.) trusses etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete. Electric resistance or induction butt welded tubes	kg	1511.98			
	Providing fitting and fixing (600x600)mm 90mm thick C.I. Man hole cover and frame of 25 Kg. weight complete as directed and specified	each	2.00			
26	SHEET ROOFING					
	Providing corrugated G.S. sheet roofing including vertical / curved surface fixed with polymer coated J or L hooks, bolts and nuts 8 mm diameter with bitumen and G.I. limpet washers or with G.I. limpet washers filled with white lead, including a coat of approved steel primer and two coats of approved paint on overlapping of sheets complete (up to any pitch in	Sq.m	63			

M. UG FIRE FIGHTING SUMP & PUMP HOUSE (CIVIL)

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	horizontal/ vertical or curved surfaces), excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required: 0.63 mm thick with zinc coating not less than 275 gm/m ²					
	Providing ridges or hips of width 60 cm overall width plain G.S. sheet fixed with polymer coated J or L hooks, bolts and nuts 8 mm dia G.I. limpet and bitumen washers complete: 0.63 mm thick with zinc coating not less than 275 gm/m ²	Rm	8.40			
27	PLINTH PROTECTION WORKS: Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources) over 75mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including necessary excavation, levelling & dressing & finishing the top smooth.	Sq.m	20.02			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

N. UG FIRE FIGHTING SUMP & PUMP HOUSE (ELECTRICAL)						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	Wiring in surface/ recessed PVC conduit FR (Finolex /RR Kabel /Nicco / Anchor or Equivalent Make as approved by the Deptt.) cable					
1	Wiring for drawing sub-main line with P.V.C. insulated single core unsheathed industrial (Multistrand) cable FR conforming to IS-694: 1990 with flexible bright annealed electrolytic copper conductor for voltage grade up to 1100 volts (Finolex /RR Kabel /Nicco / Anchor or Equivalent Make as approved by the Deptt.) PVC conduit (Berlia/ AKG / Precision/ Presto Plast/ Polycab/ MW or equivalent make as approved by the Deptt.) including earth continuity in surface/ recessed 20 mm. dia. 2mm thick/ heavy ISI marked IS: 9537 PART - III rigid PVC conduit wiring system.					
a)	With 2 x 2.5 sq. mm. + earth continuity with 1x1.5 sq. mm. in 20 mm. dia. 2mm thick/ heavy rigid PVC IS: 9537 Part - III conduit.	Metre.	40			
b)	With 2 x 4 sq. mm. + earth continuity with 1x2.5 sq. mm. cable in 20 mm. dia. 2mm thick/ heavy rigid PVC IS: 9537 Part - III conduit.	Metre.	3			
c)	With 2 x 6 sq. mm. + earth continuity with 1x 4 sq. mm. cable in 25 mm. dia. 2mm thick/ heavy rigid PVC IS: 9537 Part - III conduit.	Metre.	2			
d)	With 2 x 10 sq. mm. + earth continuity with 1x 6 sq. mm. cable in 25 mm. dia. 2mm thick/ heavy rigid PVC IS: 9537 Part - III conduit.	Metre.	8			
2	Wiring for drawing sub-main line with P.V.C. insulated single core unsheathed industrial (Multistrand) cable FR conforming to IS-694: 1990 with flexible bright annealed electrolytic copper conductor for voltage grade up to 1100 volts (Finolex /RR Kabel /Nicco / Anchor or Equivalent Make as approved by the Deptt.) in surface/ recessed PVC 20 mm. dia. 2mm thick/ heavy ISI marked IS: 9537 PART - III rigid PVC conduit (Berlia/ AKG / Precision/ Presto Plast/ Polycab/ MW or equivalent make as approved by the Deptt.) wiring system: With 4 x 10 sq. mm. + earth continuity with 2x6 sq. mm. cable in 40 mm. dia. 2mm thick/ heavy rigid PVC IS: 9537 Part - III conduit.	Metre	20			
3	Wiring for 5 pin 6 amp plug with 1.5 sq mm P.V.C. insulated single core unsheathed industrial (Multistrand) cable FR conforming to IS-694: 1990 with flexible bright annealed electrolytic copper conductor for voltage grade up to 1100 volts (Finolex /RR Kabel / Nicco / Anchor or Equivalent Make as approved by the Deptt.) including 5 pin 6 amp socket outlet (Anchor penta/ Gold medal /Kolor kany.Kom/Havells or equivalent make as approved by the Deptt.) make and 6 amp flush type switch (Anchor penta /Gold medal / Kolor kany.Kom/ Havells or equivalent make as approved by the Deptt.) make) earthing the 3rd pin of the socket as required on the switch board in surface/ recessed P.V.C. conduit wiring system. When fitted on same board of light and fan.	Each	2			
4	Wiring to 5 a pin 6 Amps plug point with 1.5 sq. mm P.V.C. insulated single core unsheathed industrial (Multistrand) cable FR conforming to IS-694: 1990 with flexible bright annealed electrolytic copper conductor for voltage grade up to 1100 volts (Finolex /RR Kabel / Nicco / Anchor or Equivalent Make as approved by the Deptt.) in surface/ recessed 2 mm thick/ heavy rigid ISI marked IS: 9537 PART - III rigid PVC conduit (Berlia/ AKG/ Precision/ Presto Plast/ Polycab/ MW or equivalent make as approved by the Deptt.) wiring system including earth continuity with 1.5 sq. mm. cable to third pin of the plug socket etc. as required complete.					

N. UG FIRE FIGHTING SUMP & PUMP HOUSE (ELECTRICAL)

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	Short point up to 3.00 metre. length.	Each	1			
	Medium point up to 6.00 metre. Length.	Each	1			
	Long point up to 10.00 metre. Length.	Each	0			
5	Wiring for 5/6 pin 16 Amps power plug point with 4 sq. mm. P.V.C. insulated single core unsheathed industrial (Multistrand) cable FR conforming to IS- 694: 1990 with flexible bright annealed electrolytic copper conductor for voltage grade up to 1100 volts (Finolex /RR Kabel / Nicco / Anchor or Equivalent Make as approved by the Deptt.) in surface/ recessed conduit wiring system including earth continuity with 2.5 sq. mm cable to the 3rd pin of the socket as required complete with 20 mm. dia. 2mm thick/ heavy ISI marked IS: 9537 PART - III rigid PVC conduit (Berlia/ AKG / Precision/ Presto Plast/ Polycab/ MW or equivalent make as approved by the Deptt.)					
	Short point up to 3.00 metre. length.	Each	2			
	Medium point up to 6.00 metre. Length.	Each	2			
6	Wiring for light/fan/call bell point with 3x1.5 sq. mm. P.V.C. insulated single core unsheathed industrial (Multistrand) cable FR conforming to IS- 694: 1990 with flexible bright annealed electrolytic copper conductor for voltage grade up to 1100 volts (Finolex/ RR Kabel/ Nicco / Anchor or Equivalent Make as approved by the Deptt.) in surface/ recessed conduit wiring system with 20mm dia 2mm thick / heavy rigid PVC IS: 9537 Part - III conduit (Berlia/ AKG / Precision/ Presto Plast/ Polycab/ MW or equivalent make as approved by the Deptt.) ceiling rose etc. complete					
	Short point up to 3.00 metre. length.	Each	4			
	Medium point up to 6.00 metre. Length.	Each	2			
	Long point up to 10.00 metre. Length.	Each	2			
	LUMINIARIES,CEILING FAN,EXHAUST FAN ETC.					
7	Supplying including fitting fixing of following A.C. Ceiling fan complete with all accessories like down rod, canopy etc. of following sweeps with making necessary connection as approved by the Deptt.)as required complete and as directed by the Department [Without regulator]. Supplying including fitting fixing of following A.C. Exhaust fan in the existing hole on the wall of following sweeps with making necessary connection as approved by Deptt.) as required complete & as directed by Department. Domestic Heavy Duty 450 mm sweep 900 RPM Single phase (ORIENT make) [EFH]	Each	4			
8	Supplying, fitting fixing of LED Batten Tubes high quality aluminium extruded with decorative end caps connection with 1.5 Sq.mm 1 core PVC insulated round copper conductor as required and as directed by the department. B118601000 [FL]	Each	4			
	MODULARSWITCH					
9	Supplying including and fixing of following Metal boxes for MODEL RANGE LEGRAND (MYRIUS), ANCHOR (VIOLA), MK (WRAPAROUND/ PLUS), ABB (CHEIRON), KOLORS (KREST), SCHNEIDER (VIVACE), CRABTREE in surface/ recessed system complete as per direction of department.					
	3 module type Metal	Each	4			
	12-16 module type Metal	Each	1			
	24 module type Metal	Each				
10	Supplying including fitting fixing of following front plate of suitable colour MODEL RANGE LEGRAND (MYRIUS), ANCHOR (VIOLA), MK (WRAPAROUND/ PLUS), ABB (CHEIRON), KOLORS (KREST), SCHNEIDER (VIVACE), CRABTREE as per direction of department.					
	3 module	Each	4			
	16 module	Each	1			

N. UG FIRE FIGHTING SUMP & PUMP HOUSE (ELECTRICAL)						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
11	Supplying with fitting fixing of blank plate single in modular switch system MODEL RANGE LEGRAND (MYRIUS), ANCHOR (VIOLA), MK (WRAPAROUND/PLUS), ABB (CHEIRON), KOLORS (KREST), SCHNEIDER (VIVACE), CRABTREE complete as per direction of department.	Each	6			
12	Supplying including installation of socket outlet 6/16 Amps 3/5 pin combine shuttered complete , MODEL RANGE LEGRAND (MYLINC), ANCHOR (ROMA), MK (IVORY), ABB (CLASSIC), KOLORS (KRAZE), SCHNEIDER (OPAL), PHILIPS, Havells including making necessary connection as per direction of department.	Each	2			
13	Supplying with fitting fixing of 16 amp one way modular clip in switch, MODEL RANGE LEGRAND (MYLINC), ANCHOR (ROMA), MK (IVORY), ABB (CLASSIC), KOLORS (KRAZE), SCHNEIDER (OPAL), PHILIPS, Havells including making necessary connection as per direction of department.	Each	2			
14	Supplying with fitting fixing of 6 amp one way modular clip in switch, MODEL RANGE LEGRAND (MYLINC), ANCHOR (ROMA), MK (IVORY), ABB (CLASSIC), KOLORS (KRAZE), SCHNEIDER (OPAL), PHILIPS, Havells including making necessary connection as per direction of department.	Each	2			
15	SUPPLY AND FIXING OF RIGID PVC CONDUIT (AKG / Precision/ Presto Plast/Polycab/ MW or equivalent make as approved by the Deptt.) IN SURFACE AND RECESS WIRING SYSTEM: Supply and fixing 19 mm dia 2.00mm average wall thickness heavy rigid PVC IS: 9537 Part - III conduit (Berlia/ AKG / Precision/ Presto Plast/Polycab/ MW or equivalent make as approved by the Deptt.) in recessed system including cutting the wall and making good the same as required.	Metre	12			
16	Wiring with P.V.C. insulated unsheathed 1.1 K.V. grade single core copper conductor FR cable in existing surface/ recessed conduit wiring system: Wiring for Co - axial Jelly Flooded (Unarmoured) (FINOLEX /RR KABEL /NICCO / ANCHOR make) cable in existing surface conduit wiring system including connection etc as required. Co - axial Jelly Flooded (Unarmoured) RG 6 (Copper)	Metre	5			
17	FITTINGS AND ACCESSORIES (ALL PRODUCTS SHOULD BE ENERGY EFFICIENT AND ENVIRONMENT FRIENDLY): Supplying and fixing of bulk head fitting suitable for CFL lamp complete with all accessories including 20 watts CFL lamp and connection as approved by the Deptt.) as required. [BH]	Each	4			
	SWITCH GEAR & PROTECTION: INDUSTRIAL SOCKETS, DB WITHOUT MCB & MCCB, MCB, RCCB, RCBO, SFU, CHANGE OVER ETC. (C&S, Havells, INDOASIAN, HPL OR EQUIVALENT as approved by the Deptt.)					
18	Supplying fitting and fixing industrial Plug & Socket in surface mounting SPN sheet steel powder painted MCB DB incorporated with MCB DIN rail, neutral link Earth bar of the following rating of DP MCB complete with making necessary connection etc. as specified and directed by the Deptt. 20A Capacity. (C&S, Havells, INDOASIAN, HPL or equivalent as approved by the Deptt.) make)	Each	1			
19	Supplying with fitting and fixing sheet steel, phosphatised, powder painted Single door surface mounting MCB enclosure incorporated with bas-bar, Neutral link, Earth bar and din rail etc fitted on wall with grouting nuts & bolts as reqd. complete with making					

N. UG FIRE FIGHTING SUMP & PUMP HOUSE (ELECTRICAL)

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	necessary connection as approved, specified and directed by the deptt. Schneider neo break, C&S, Havells, INDOASIAN, HPL or equivalent as approved by the Deptt.) make)					
	2 way single door	Each	1			
	4 way single door	Each	1			
	MCB DB (ABB, SCHNEIDER MG, LEGRAND, HAGER MAKE) & (SCHNEIDER NEO BREAK, C&S, Havells, INDOASIAN, HPL OR EQUIVALENT MAKE AS PPROVED BY THE DEPTT.)					
20	MCB IN-comer SPN DB: Supplying with fitting and fixing sheet steel, phosphatised, powder painted dust & vermin proof Double door IP-43 surface mounting SPN MCB DB incorporated with bas-bar, Neutral link, Earth bar and din rail etc fitted on wall with grouting nuts & bolts as reqd. complete with making necessary connection as approved, specified and directed by the deptt. ABB, Schneider MG, legrand, Hager make)					
	8 way SPN Double Door	Each	1			
	12 way SPN Double Door	Each	1			
21	MCB IN-comer TPN (Horizontal DB): Supplying with fitting and fixing sheet steel, phosphatised, powder painted dust & vermin proof Double door IP-43 double door surface mounting TPN MCB DB incorporated with bas-bar, Neutral link, Earth bar and din rail etc fitted on wall with grouting nuts & bolts as reqd. complete with making necessary connection as approved, specified and directed by the deptt. ABB, Schneider MG, legrand, Hager make)					
	4 way TPN (4+12) double door	Each	1			
	8 way TPN (4+24) double door	Each				
22	MCB IN-comer (TPN VERTICAL DB): Supplying with fitting and fixing MCCB income and MCB outgoing sheet steel, phosphatised, powder painted double door IP-43 surface mounting vertical TPN MCB DB incorporated with bas-bar up to 250A, Neutral link, Earth bar and din rail etc fitted on wall with grouting nuts & bolts as reqd. complete with making necessary connection as approved, specified and directed by the deptt. ABB, Schneider MG, legrand, Hager make)					
	4 way TPN (4+12) double door	Each	1			
	MCB, MCCB, RCCB, RCBO (ABB, SCHNEIDER MG, LEGRAND, AND HAGER MAKE) & (SCHNEIDER NEO BREAK, C&S, Havells, INDO ASIAN, HPL OR EQUIVALENT MAKE AS PPROVED BY THE DEPTT.) MCB (Conform to IS / IEC 60898-1:200/ MCCB (Conform to IS/IEC 60947- RCCB (Conform to IS/IEC 12640 / 61008)					
23	Supplying with fitting and fixing single Pole 10 KA 240/415V 50Hz MCB of the following capacity complete with making necessary connection as approved, specified and directed by the deptt. C Series (Schneider MG, legrand, Hager make)					
	6 to 32A	Each	20			
	40A	Each				
24	Supplying with fitting and fixing DP 10 KA 240/415V 50Hz MCB of the following capacity complete with making necessary connection as approved, specified and directed by the deptt. C Series (ABB, Schneider MG, legrand, Hager make)					
	6 to 32A	Each	4			
	40A	Each	2			
	63A	Each				
25	Supplying with fitting and fixing 30/100/300mA sensitivity 240/415V 50Hz DP RCCB of the following capacity complete with making necessary connection as					

N. UG FIRE FIGHTING SUMP & PUMP HOUSE (ELECTRICAL)

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	approved, specified and directed by the deptt. 100/300mA sensitivity DP RCCB (ABB, Schneider MG, legrand, Hager make)					
	25A	Each	4			
	40A	Each	2			
26	Supplying with fitting and fixing TP 10 KA 240/415V 50Hz MCB of the following capacity complete with making necessary connection as approved, specified and directed by the deptt. C Series (ABB, Schneider MG, legrand, Hager make)					
	6 to 32A	Each	1			
	40A	Each				
27	Supplying with fitting and fixing panel mounting open execution 25 KA 415V 50Hz 4P MCCB (Ics=Icu, adjustable Ir setting 0.7) without enclosure of the following capacity complete with making necessary connection as approved by the Deptt. as specified and directed by the deptt. 25 KA 415V 50 Hz 4P MCCB (Schneider, legrand, Siemens make)					
	40A	Each				
	63A	Each	1			
	100A	Each				
	EARTHING					
28	Supply, installation & testing of G.I. earth station with perforated 40 mm dia and 4.50 Metre long heavy duty G.I. pipe with necessary 40 mm dia. G.I. Fittings such as Socket, Tee, elbow, nipple and 50 mmx40 mm G.I. reducing socket for funnel including locking arrangement 300 mmx300 mmx6 mm hinged cover C.I. earth plate complete with digging of earth pit, construction of brick chamber and plastering of both inner & outer surface of wall as specified and directed by the deptt.	Each	1			
29	Extra for using salt (5 K and Charcoal (64 K in pipe Earth Station pit to provide low impedance ground in location of high soil resistivity as and when required and specified by the Deptt.	Each	1			
30	Supply, installation & testing of Copper Plate earth station with 600 mmx600 mmx3 mm copper earth plate with necessary 40 mm dia. G.I. medium duty watering pipe with G.I. Fittings such as Socket, Tee, elbow, nipple and 50 mmx40 mm G.I. reducing socket for funnel including locking arrangement with 300 mmx300 mmx6 mm C.I. hinged cover plate complete with digging of earth pit, construction of brick chamber and plastering of both inner & outer surface of wall as specified and directed by the deptt.	Set	1			
31	Extra for using salt (5 K and Charcoal (96 K in G.I./Copper plate Earth Station pit to provide low impedance ground in location of high soil resistivity as and when required and specified by the deptt.	Set	1			
32	Supplying & laying of 6 SWG G.I. earth from Earth Electrode (below G.L.) to electrical switch gears or electrical machineries including making necessary connection as approved specified & directed by the deptt.	Metre.	3			
33	Supplying & laying of 25X5mm size G.I. strips drawn on surface from earth electrode to Electrical switch gears, machineries etc complete with supply of G.I. nuts & bolts, screws etc including riveting, soldering & making necessary connection as approved, specified and directed by the deptt.	Metre	5			
34	Supplying & laying of 25X5mm size Copper strips drawn on surface from earth electrode to Electrical switch gears, machineries etc complete with supply of Brass nuts & bolts, screws etc including riveting, soldering & making necessary connection as approved,	Metre	3			

N. UG FIRE FIGHTING SUMP & PUMP HOUSE (ELECTRICAL)

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	specified and directed by the deptt.					
35	Supply, fitting & fixing of Lighting Finial Arrestor made of 25 mm dia 300 mm long solid G.I. tube having 85 mm dia. single prong at top and 3 mm base plate at bottom complete with fitting & fixing with G.I. nuts & bolts on roof, RCC slab, top of column etc. as specified and directed by the deptt.	Each	1			
36	Supply, fitting & fixing 20 mmx5 mm G.I. strips drawn on vertically or horizontally on building wall/parapet wall in surface system complete with supply of G.I. Nuts & Bolts, Screws etc including riveting, soldering and making connection as approved by the Deptt.) with earth electrode G.I. strips and Lightning Arrestor etc. as specified and directed by the deptt.	Metre	5			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

O. DEEP TUBE WELL						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
1	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer					
	100 mm nominal size dia	Metre	200			
	150 mm nominal size dia	Metre	20			
2	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings This includes jointing of pipes & fittings with one step CPVC solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in Charge. (SUCTION					
	External work: 40 mm nominal outer dia Pipes	Metre	200			
3	Providing and placing in position filters of 40 mm diameter G.I./ PVC pipe with brass strainer of approved quality.	Metre	30			
4	Providing and fixing gun metal non- return valve of approved quality (screwed end) : 40 mm nominal bore					
	Horizontal	Each	1			
	Vertical	Each	1			
5	Development of tube well in accordance with IS : 2800 (part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method, collecting water samples & getting tested in approved laboratory, i/c disinfection of tubewell, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in- charge.	Hour	6			
6	Providing and fixing suitable size threaded mild steel cap or spot welded plate to the top of bore well housing/ casing pipe, removable as per requirement, all complete for borewell of:					
	100 mm dia	each	1			
	150 mm dia	each	1			
7	Providing and fixing M.S. clamp of required dia to the top of casing/ housing pipe of tubewell as per IS: 2800 (part I), including necessary bolts & nuts of required size complete: 150 mm clamp	each	3			
8	Providing and fixing Bail plug/ Bottom plug of required dia to the bottom of pipe assembly of tubewell as per IS:2800 (part I).					
	100 mm dia	each	1			
	150 mm dia.	each	3			
9	Gravel packing in tubewell construction in accordance with IS: 4097, including providing gravel fine/ medium/ coarse, in required grading & sizes as per actual requirement, all complete as per direction of Engineer-in-charge.	cum	2			
	NON-SCHEDULE ITEMS:					
	Tube Well					
10	Labour for test boring with 40mm (internal) dia G.I. Pipes including keeping surplus of earth and every 2.00m after first 3.00m depth and delivering the same in nearest P.W.D. camp in the small tin container (container, scaffolding, tools etc. will have to be arranged by the contractor at his own cost).	RM	200			

O. DEEP TUBE WELL

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
11	Machine boring of deep tube well upto 150 mm dia. Bore hole as directed by the Engineer in Charge	RM	200			
	Motor Pump Set:					
12	Supplying including installation, connection as approved by the Deptt., testing and commissioning of SUBMERSIBLE PUMP SET 3 (Three Phase) with steel cable rope and submersible cable complete as directed and specified by the deptt.: Three phase Submersible motor pump set (Texmo / Crompton Greaves/ Aquatic/ CRI/ V-Guar suitable for 100 mm bore well and above. 1 HP STAGE 5 to 18 with MCB controlled Submersible motor pump set control panel.	Each	1			
13	Supplying including installation, connection as approved by the Deptt., testing and commissioning of JET PUMP SET (HORIZONTAL) complete as directed and specified by the deptt.: 1 HP single Phase jet pump set (Horizontal(Crompton Greaves/ Aquatic/ CRI/ V-Guard make) 2900 rpm with DOL Starter (Crompton Greaves/ Control & Switch Gear/ BCH/ L& T / Siemens make).	Each	1			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

P. INTERNAL VEHICULAR ROAD						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	GRANULAR SUB-BASE WITH WELL GRADED MATERIAL (Table 400.1)					
1	By Mix in Place Method: Construction of granular sub-base by providing well graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with smooth wheel roller to achieve the desired density, complete as per Technical Specification Clause 401. (ii) For Grading II Material	Cum	76.67			
	WATER BOUND MACADAM SUB- BASE/BASE					
2	WBM Grading II					
	Using stone screening Type-B 11.2 mm for Gr.II					
	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with smooth wheel roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening/binding materials to fillup the interstices of coarse aggregate, watering and compacting to the required density grading 2 as per Technical Specification Clause 405.					
	By Manual Means	Cum	57.51			
3	WBM Grading III					
	Using stone screening Type-B 11.2 mm for Gr.III					
	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with smooth wheel roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening to fill-up the interstices of coarse aggregate, watering and compacting to the required density Grading 3 as per Technical Specification Clause 405.					
	By Manual Means	Cum	57.51			
	CEMENT CONCRETE PAVEMENT					
4	INTERLOCKING CONCRETE BLOCK PAVEMENT					
	Interlocking pavement block: Providing and laying interlocking concrete block pavement (M40) having thickness 80mm as per technical specification clause 1504 complete including carriage.					
	Including Edge block/ Edge restraints	Sqm	766.74			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

Q. INTERNAL NON VEHICULAR PAVEMENT						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	GRANULAR SUB-BASE WITH WELL GRADED MATERIAL (Table 400.1)					
1	By Mix in Place Method					
	Construction of granular sub-base by providing well graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with smooth wheel roller to achieve the desired density, complete as per Technical Specification Clause 401.					
	For Grading II Material	Cum	7.65			
	WATER BOUND MACADAM SUB- BASE/BASE					
2	WBM Grading II					
	Using stone screening Type-B 11.2 mm for Gr.II					
	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with smooth wheel roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening/binding materials to fillup the interstices of coarse aggregate, watering and compacting to the required density grading 2 as per Technical Specification Clause 405.					
	By Manual Means	Cum	5.74			
	CEMENT CONCRETE PAVEMENT					
3	INTER LOCKING CONCRETE BLOCK PAVEMENT					
	Interlocking pavement block					
	Providing and laying interlocking concrete block pavement (M40) having thickness 80mm as per technical specification clause 1504 complete including carriage.					
	Including Edge block/ Edge restraints	Sqm	76.52			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

R. FIRE FIGHTING SYSTEM TRANSIT ACCOMODATION						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	HYDRANT SYSTEM					
1	Providing, Fixing, testing & Commissioning of Single Headed Gun Metal ISI Marked oblique pattern Hydrant Landing Valve with 80 mm dia, flanged inlet & 63 mm dia instantaneous type female outlet complete with cap and chain, twist release lug and all accessories as per IS:5290-1983 (Type-'A') and specifications complete as required. (MAKE:ESSEL/WINCO/NEWAGE)	Each	6			
2	Providing RRL Hose with ISI Marked (IS:636) 63 mm dia X15 M long complete with instantaneous type Gun Metal 3 mm dia ISI Marked male & female couplings (IS:903) bound & riveted to hose pipes with copper rivets and copper wire complete as reqd. (MAKE: NIRMAL RUBBER/NEWAGE)	Each	12			
3	Providing & fixing of Gun Metal fire Brigade connection (withdrawl connecting head) consisting of 63mm instantaneous type male coupling with built in check valves and 150mm dia flanged outlet complete with bolts, nuts and rubber insertions as per IS:904-1983 complete as reqd. MAKE:ESSEL/WINCO/NEWAGE- 2 way	Each	1			
4	Providing & Fixing of Weather Proof M.S. Cabinet (to enclose above Inlet Collection Head Connection) fabricated from 16 S.W.G. M.S. sheet centre opening with 3 mm thick full front glass door and locking arrangement duly painted with one coat of primer and two or more coats of synthetic enamel paint of approved make and shade and suitably mounted. Exact size and shape shall be subject to site conditions and prior approval.	Each	6			
5	Providing & fixing of Gun Metal fire Brigade suction hose coupling (draw out connection) with nut for female coupling as per IS:902- 1974 complete with 150 mm dia GI suction pipe and foot	Each	6			
6	Providing ,Fixing ,Testing & Commissioning of air Release Valve- 50 mm dia	Each	4			
7	Providing, Fixing, Testing & Commissioning of Mild Steel Black Pipe (IS:1239 part-I) Heavy class including cutting, screwing, welding etc. and providing all fittings viz forged steel screwed fitting upto 50mm dia and bolt welded above 50mm dia flanges, bends, tees, reducers, elbow, clamps, hangers etc including cutting holes and chases in brick or RCC walls/ slabs and making good the same to the approval of Engineer-in-charge/ consultant complete including painting with one coat of primer and two or more coats of synthetic enamel paint of approved make and shade including steel work complete as required. (Make:TATA/JINDAL/NEZONE)					
	150 mm dia	RM	50			
	100 mm dia	RM	10			
	80 mm dia	RM	10			
	40 mm dia	RM	10			
	25 mm dia	RM	10			
8	Providing, Fixing, Testing & Commissioning of Mild Steel Black Pipe (IS:1239 part-I) Heavy class including cutting, screwing, welding etc. complete with all fittings (butt welded) viz flanges, bends, tees, elbows, reducers etc including excavation (upto 1.5 m Deep), back filling and removal of surplus soil & providing anti corrosive treatment (coating and wrapping) as per IS:10221 with 4 mm thick					
	a) 200 mm dia	RM	60			
	b) 150 mm dia	RM	20			
	c) 100 mm dia	RM	20			
9	Supplying & Fixing Cast iron body Non Return valves					

R. FIRE FIGHTING SYSTEM TRANSIT ACCOMODATION						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	complete with matching flanges, rubber insertion, nuts, bolts and washer etc. (IS:5312) of following sizes complete as reqd.					
	a) 150 mm dia	Each	6			
	b) 100 mm dia	Each	6			
10	Supplying & Fixing, cast iron body Butterfly Valves with matching flanges, rubber insertion, nuts, bolts and washer etc (IS:13095) of following size complete as reqd.: 100 mm dia	Each	6			
11	Providing ,Fixing,Testing & Commissioning of G.M. Stop Valve ISI Marked screwed type tested to 30Kg/cm2 pressure as per IS:778- 1984 of following sizes complete as reqd.: 50 mm dia	Each	6			
12	Providing, erection testing, Commissioning of Cast Iron Foot Valve/Stainer confirming to IS:4038/1538 complete with flanges, nuts, bolts and washer etc as required: 150 mm dia	Each	6			
13	Providing,erection testing & commissioning of pressure gauge 100 mm dia (0-10Kg/cm2)	Each	6			
14	Providing ,erection,Testing & Commissioning of Pressure Switch (MAKE:INDFOSS)	Each	6			
15	Supplying, Installation,Testing & Commissioning of 15 mm dia quartzoid Bulb Type G.M. Sprinkler Head suitable to operate at 68* C complete as reqd.(UL/FM/LP Listed/ Approved)	Each	70			
16	Supplying, Installation, Testing & Commissioning of First Aid Hose reel drawn with 30 Mtrs. Long rubber hose and G.M shut off nozzle, 25mm dia Gate valve, Union pipe complete set confirming to IS: 884.	Each	2			
	FIRE EXTINGUISHER					
17	Supply, Installation, Fixing of DRY CHEMICAL POWDER Fire Extinguisher confirming to IS: 2171 with ISI mark and CO2 cartridge will be confirming to IS: 4947 with ISI mark, Powder will be confirming to IS: 4308 with ISI Mark (5 KG) BRAND : FIRESTOP / FIREND / FIRE SHIELD	Each	6			
18	Supply, Installation, Fixing of MECHANICAL FOAM (AFFF) Fire Extinguisher confirming to IS: 10204 with ISI Mark and CO2 Cartridge will be confirming to IS: 4947 with ISI mark, (AFFF) will be confirming to IS: 4989 with ISI Mark.(9 LTRS) BRAND : FIRESTOP / FIREND / FIRE SHIELD	Each	6			
19	Supply, Installation, Fixing of CARBON DIOXIDE Fire Extinguisher confirming to IS: 2878 with ISI Mark.(4.5 LITERS), BRAND: FIRESTOP / FIREND / FIRESHIELD	Each	6			
20	Supplying, installation, testing and commissioning of Electric driven Main Fire Pump suitable for automatic operation and consisting of following, complete in all respects, as required : (a) Horizontal type, multistage, centrifugal, split casing pump of cast iron body & bronze impeller with stainless steel shaft, mechanical seal conforming to IS 1520. Suitable HP Squirrel cage induction motor, TEFC, synchronous speed 1500 RPM, suitable for operation on 415 volts, 3 phase 50 Hz, AC supply with IP 55 protection for enclosure, horizontal foot mounted type with Class-'F' insulation, conforming to IS-325.					
	2280 lpm at 70 m Head	Set	1			
	2280 lpm at 70 m Head	Set	1			
21	Supplying, installation, testing & commissioning of manual call boxes of MS construction in surface/ recess with stainless steel chain & hammer assembly complete with glass and push button	Each	3			
22	Supplying, installation, testing & commissioning of smoke detector with builtin LED and mounting base complete with all connections etc. as required.	Each	37			

R. FIRE FIGHTING SYSTEM TRANSIT ACCOMODATION

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
23	Supplying, installation, testing & commissioning response indicator on surface/recess MS box having two LEDs metallic cover complete with all connections etc. as required	Each	37			
24	Supplying, installation, testing & commissioning fire alarm sounder with facility to make announcement, mounted in M.S. box (16 SWG) with hinged cover plate & suitable for operation with amplifier i/c line matching transformer etc. complete as required.	Each	3			
	AIR VESSEL					
25	Supplying and fixing air vessel made of 250 mm dia, 8 mm thick MS sheet, 1200 mm in height with air release valve on top and flanged connection to riser, drain arrangement with 25 mm dia gun metal wheel valve with required accessories, pressure gauge and painting with synthetic enamel paint of approved shade as required.	Set	1			
26	Supply, application, testing of PYPKOTE Anti-corrosive (4mm thick)	Sqm	10			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

S. FIREFIGHTING SYSTEM STAFF QUARTER						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	HYDRANT SYSTEM					
1	Providing, Fixing, testing & Commissioning of Single Headed Gun Metal ISI Marked oblique pattern Hydrant Landing Valve with 80 mm dia, flanged inlet & 63 mm dia instantaneous type female outlet complete with cap and chain, twist release lug and all accessories as per IS:5290-1983 (Type-'A') and specifications complete as required. (MAKE:ESSEL/WINCO/NEWAGE)	Each	6			
2	Providing RRL Hose with ISI Marked (IS:636) 63 mm dia X15 M long complete with instantaneous type Gun Metal 3 mm dia ISI Marked male & female couplings (IS:903) bound & riveted to hose pipes with copper rivets and copper wire complete as reqd. (MAKE: NIRMAL RUBBER/NEWAGE)	Each	12			
3	Providing & fixing of Gun Metal fire Brigade connection (withdrawl connecting head) consisting of 63mm instantaneous type male coupling with built in check valves and 150mm dia flanged outlet complete with bolts, nuts and rubber insertions as per IS:904-1983 complete as reqd. MAKE:ESSEL/WINCO/NEWAGE: 2 way	Each	6			
4	Providing & Fixing of Weather Proof M.S. Cabinet (to enclose above Inlet Collection Head Connection) fabricated from 16 S.W.G. M.S. sheet centre opening with 3 mm thick full front glass door and locking arrangement duly painted with one coat of primer and two or more coats of synthetic enamel paint of approved make and shade and suitably mounted. Exact size and shape shall be subject to site conditions and prior approval.	Each	6			
5	Providing & fixing of Gun Metal fire Brigade suction hose coupling (draw out connection) with nut for female coupling as per IS:902- 1974 complete with 150 mm dia GI suction pipe and foot	Each	6			
6	Providing ,Fixing ,Testing & Commissioning of air Release Valve: 50 mm dia	Each	6			
7	Providing, Fixing, Testing & Commissioning of Mild Steel Black Pipe (IS:1239 part-I) Heavy class including cutting, screwing, welding etc. and providing all fittings viz forged steel screwed fitting upto 50mm dia and bolt welded above 50mm dia flanges, bends, tees, reducers, elbow, clamps, hangers etc including cutting holes and chases in brick or RCC walls/ slabs and making good the same to the approval of Engineer-in-charge/ consultant complete including painting with one coat of primer and two or more coats of synthetic enamel paint of approved make and shade including steel work complete as required. (Make:TATA/JINDAL/NEZONE)					
	150 mm dia	RM	50			
	100 mm dia	RM	10			
	80 mm dia	RM	10			
	40 mm dia	RM	10			
	25 mm dia	RM	10			
8	Providing, Fixing, Testing & Commissioning of Mild Steel Black Pipe (IS:1239 part-I) Heavy class including cutting, screwing, welding etc. complete with all fittings (butt welded) viz flanges, bends, tees, elbows, reducers etc including excavation (upto 1.5 m Deep), back filling and removal of surplus soil & providing anti corrosive treatment (coating and wrapping) as per IS:10221 with 4 mm thick					
	a) 200 mm dia	RM	60			
	b) 150 mm dia	RM	20			
	c) 100 mm dia	RM	20			
9	Supplying & Fixing Cast iron body Non Return valves					

S. FIREFIGHTING SYSTEM STAFF QUARTER

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	complete with matching flanges, rubber insertion, nuts, bolts and washer etc. (IS:5312) of following sizes complete as reqd.					
	a) 150 mm dia	Each	6			
	b) 100 mm dia	Each	6			
10	Supplying & Fixing, cast iron body Butterfly Valves with matching flanges, rubber insertion, nuts, bolts and washer etc (IS:13095) of following size complete as reqd.: 100 mm dia	Each	4			
11	Providing ,Fixing,Testing & Commissioning of G.M. Stop Valve ISI Marked screwed type tested to 30Kg/cm2 pressure as per IS:778- 1984 of following sizes complete as reqd.: 50 mm dia	Each	4			
12	Providing, erection testing, Commissioning of Cast Iron Foot Valve/Stainer confirming to IS:4038/1538 complete with flanges, nuts, bolts and washer etc as required: 150 mm dia	Each	1			
13	Providing,erection testing & commissioning of pressure gauge 100 mm dia (0-10Kg/cm2)	Each	1			
14	Providing ,erection,Testing & Commissioning of Pressure Switch(MAKE:INDFOSS)	Each	1			
15	Supplying, Installation,Testing & Commissioning of 15 mm dia quartzoid Bulb Type G.M. Sprinkler Head suitable to operate at 68* C complete as reqd.(UL/FM/LPC listed/Approved)	Each	70			
16	Supplying, Installation, Testing & Commissioning of First Aid Hose reel drawn with 30 Mtrs. Long rubber hose and G.M shut off nozzle, 25mm dia Gate valve, Union pipe complete set confirming to IS: 884.	Each	2			
	FIRE EXTINGUISHER					
17	Supply, Installation, Fixing of DRY CHEMICAL POWDER Fire Extinguisher confirming to IS: 2171 with ISI mark and CO2 cartridge will be confirming to IS: 4947 with ISI mark, Powder will be confirming to IS: 4308 with ISI Mark (5 KG) BRAND : FIRESTOP / FIREND / FIRE SHIELD	Each	6			
18	Supply, Installation, Fixing of MECHANICAL FOAM (AFFF) Fire Extinguisher confirming to IS: 10204 with ISI Mark and CO2 Cartridge will be confirming to IS: 4947 with ISI mark, (AFFF) will be confirming to IS: 4989 with ISI Mark. (9 LTRS) BRAND : FIRESTOP / FIREND / FIRE SHIELD	Each	6			
19	Supply, Installation, Fixing of CARBON DIOXIDE Fire Extinguisher confirming to IS: 2878 with ISI Mark.(4.5 LITERS) BRAND: FIRESTOP / FIREND / FIRESHIELD	Each	6			
20	Supplying, installation, testing & commissioning of manual call boxes of MS construction in surface/recess with stainless steel chain & hammer assembly complete with glass and push button	Each	3			
21	Supplying, installation, testing & commissioning of smoke detector with builtin LED and mounting base complete with all connections etc. as required.	Each	28			
22	Supplying, installation, testing & commissioning response indicator on surface/recess MS box having two LEDs metallic cover complete with all connections etc. as required	Each	28			
23	Supplying, installation, testing & commissioning fire alarm sounder with facility to make announcement, mounted in M.S. box (16 SWG) with hinged cover plate & suitable for operation with amplifier i/c line matching transformer etc. complete as required.	Each	3			
	AIR VESSEL					
24	Supplying and fixing air vessel made of 250 mm dia, 8 mm thick MS sheet, 1200 mm in height with air release valve on top and flanged connection to riser, drain arrangement with 25 mm dia gun metal wheel valve with required accessories, pressure gauge and	Set	1			

S. FIREFIGHTING SYSTEM STAFF QUARTER						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	painting with synthetic enamel paint of approved shade as required.					
25	Supply, application, testing of PYPKOTE Anti-corrosive (4mm thick) pipe wrapping.	Sqm	10			
Total Amount (Excluding Taxes)						

BILL OF QUANTITIES

T. FIRE FIGHTING SYSTEM SECURITY BARRACK						
Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
	HYDRANT SYSTEM					
1	Providing, Fixing, testing & Commissioning of Single Headed Gun Metal ISI Marked oblique pattern Hydrant Landing Valve with 80 mm dia, flanged inlet & 63 mm dia instantaneous type female outlet complete with cap and chain, twist release lug and all accessories as per IS:5290-1983 (Type-'A') and specifications complete as reequired . (MAKE: ESSEL/WINCO/ NEWAGE)	Each	6			
2	Providing RRL Hose with ISI Marked (IS:636) 63 mm dia X15 M long complete with instantaneous type Gun Metal 3 mm dia ISI Marked male & female couplings (IS:903) bound & riveted to hose pipes with copper rivets and copper wire complete as reqd. (MAKE: NIRMAL RUBBER/NEWAGE)	Each	12			
3	Providing & fixing of Gun Metal fire Brigade connection (withdrawl connecting head) consisting of 63mm instantaneous type male coupling with built in check valves & 150mm dia flanged outlet complete with bolts, nuts & rubber insertions as per IS:904-1983 complete as reqd.: 2 way MAKE:ESSEL/WINCO/NEWAGE	Each	6			
4	Providing & Fixing of Weather Proof M.S. Cabinet (to enclose above Inlet Collection Head Connection) fabricated from 16 S.W.G. M.S. sheet centre opening with 3 mm thick full front glass door and locking arrangement duly painted with one coat of primer and two or more coasts of synthetic enamel paint of appreoved make and shade and suitably mounted. Exact size and shape shall be subject to site conditions and prior approval.	Each	6			
5	Providing & fixing of Gun Metal fire Brigade suction hose coupling (draw out connection) with nut for female coupling as per IS:902- 1974 complete with 150 mm dia GI suction pipe and foot	Each	6			
6	Providing, Fixing, Testing & Commissioning of air Release Valve: 50 mm dia	Each	6			
7	Providing,Fixing,Testing & Commissioning of Mild Steel Black Pipe(IS:1239part-I) Heavy class including cutting, screwing, welding etc. and providing all fittings viz forged steel screwed fitting upto 50mm dia and bolt welded above 50mm dia flanges, bends, tees, reducers, elbow, clamps, hangers etc including cutting holes and chases in brick or RCC walls/ slabs and making good the same to the approval of Engineer-in-charge/ consultant complete including painting with one coat of primer and two or more coats of synthetic enamel paint of approved make and shade including steel work complete as required. (Make:TATA/JINDAL/NEZONE)					
	150 mm dia	RM	50			
	100 mm dia	RM	10			
	80 mm dia	RM	10			
	40 mm dia	RM	10			
	25 mm dia	RM	10			
8	Providing,Fixing,Testing & Commissioning of Mild Steel Black Pipe (IS:1239part-I) Heavy class including cutting, screwing, welding etc.complete with all fittings (butt welded) viz flanges, bends, tees, elbows, reducers etc including excavation (upto 1.5 m Deep) back filling & removal of surplus soil & providing anti corrosive treatment (coating & wrapping) as per IS:10221 with 4 mm thick					
	a) 200 mm dia	RM	60			
	b) 150 mm dia	RM	20			
	c) 100 mm dia	RM	20			
9	Supplying & Fixing Cast iron body Non Return valves complete with matching flanges, rubber insertion, nuts, bolts and washer etc. (IS:5312) of following sizes complete as reqd.					
	a) 150 mm dia	Each	6			
	b) 100 mm dia	Each	6			

T. FIRE FIGHTING SYSTEM SECURITY BARRACK

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
10	Supplying & Fixing, cast iron body Butterfly Valves with matching flanges, rubber insertion, nuts, bolts and washer etc (IS:13095) of following size complete as reqd.: 100 mm dia	Each	4			
11	Providing ,Fixing,Testing & Commissioning of G.M. Stop Valve ISI Marked screwed type tested to 30Kg/cm2 pressure as per IS:778- 1984 of following sizes complete as reqd.: 50 mm dia	Each	4			
12	Providing, erection testing, Commissioning of Cast Iron Foot Valve/Stainer confirming to IS:4038/1538 complete with flanges, nuts, bolts and washer etc as required: 150 mm dia	Each	6			
13	Providing,erection testing & commissioning of pressure gauge 100 mm dia (0-10Kg/cm2)	Each	6			
14	Providing ,erection,Testing & Commissioning of Pressure Switch (MAKE:INDFOSS)	Each	6			
15	Supplying, Installation,Testing & Commissioning of 15 mm dia quartzoid Bulb Type G.M. Sprinkler Head suitable to operate at 68* C complete as reqd. (UL/FM/LP Listed/Approved)	Each	70			
16	Supplying, Installation, Testing & Commissioning of First Aid Hose reel drawn with 30 Mtrs. Long rubber hose and G.M shut off nozzle, 25mm dia Gate valve, Union pipe complete set confirming to IS: 884.	Each	2			
	FIRE EXTINGUISHER					
17	Supply, Installation, Fixing of DRY CHEMICAL POWDER Fire Extinguisher confirming to IS: 2171 with ISI mark and CO2 cartridge will be confirming to IS: 4947 with ISI mark, Powder will be confirming to IS: 4308 with ISI Mark (5 KG) BRAND : FIRESTOP / FIREND / FIRE SHIELD	Each	6			
18	Supply, Installation, Fixing of MECHANICAL FOAM (AFFF) Fire Extinguisher confirming to IS: 10204 with ISI Mark and CO2 Cartridge will be confirming to IS: 4947 with ISI mark, (AFFF) will be confirming to IS: 4989 with ISI Mark.(9 LTRS) BRAND : FIRESTOP / FIREND / FIRE SHIELD	Each	6			
19	Supply, Installation, Fixing of CARBON DIOXIDE Fire Extinguisher confirming to IS: 2878 with ISI Mark.(4.5 LITERS) BRAND: FIRESTOP / FIREND / FIRESHIELD	Each	6			
20	Supplying, installation, testing & commissioning of manual call boxes of MS construction in surface/recess with stainless steel chain & hammer assembly complete with glass and push button	Each	3			
21	Supplying, installation, testing & commissioning of smoke detector with builtin LED and mounting base complete with all connections etc. as required.	Each	45			
22	Supplying, installation, testing & commissioning response indicator on surface/recess MS box having two LEDs metallic cover complete with all connections etc. as required	Each	45			
23	Supplying, installation, testing & commissioning fire alarm sounder with facility to make announcement, mounted in M.S. box (16 SWG) with hinged cover plate & suitable for operation with amplifier i/c line matching transformer etc. complete as required.	Each	3			
	AIR VESSEL					
24	Supplying and fixing air vessel made of 250 mm dia, 8 mm thick MS sheet, 1200 mm in height with air release valve on top and flanged connection to riser, drain arrangement with 25 mm dia gun metal wheel valve with required accessories, pressure gauge and painting with synthetic enamel paint of approved shade as required.	Set	1			
25	Supply, application, testing of PYPKOTE Anti-corrosive (4mm thick)	Sqm	10			
Total Amount (Excluding Taxes)						

U. Lift

Sl.	Items	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
1	<p>Supplying, Commissioning, Installation, and certification of Autolift (8 Passenger) Gearless machine Roomless about 544kg @ 1M/Sec microprocessor based V.V.V.F ARD system of 415volt, 3 phase, 50Cycles Alternating current, ground to 3rd floor about 9.0Metre with 4 stops 4 openings (All Openings on the same side) with Machine placed above the hoistway operating with collective selective on/off switch with hoistway about 750mm x 1720MM deep Finished dimensions. Ss cabin hair line with 1/2 Mirror Auto/ATTN switch, push to talk, SS flooring, Footlight, Blowerm Floor announcement Handrail protected by center opening hair line finish with infrared curtains also hoistway entrance of clear opening about 800mm x 200mm height protected by center opening SS hair line and door operation with power operated automatically. with Hrcromagrelic type which opens on energization with 24/48 VDC voltage and closes using spring tension on Deenargisation.</p> <p>Brake with Hrcromagrelic type which opens on energization with 24/48 VDC voltage and closes using spring tension onDeenargisation. The inner surft & of the brake will be provided with brake liners</p> <p>Diving Motor PMSM (Pennanenl Magret Sychronus Motor)</p> <p>Electrical Safety Device a. Mains 3 phase limit switch to protect against over travel. b. Single phasing preventor with protection against phase sequence reversal c. Full proof gate locks for landing doors. d. Car gate switch e. Over speed Governor f. Over speed safety device</p> <p>Signal IN CAR: Battery operated Emergency Light, Alarm, Digital floor Indication, Push Button for each floor, OruOllswitch, Fan switch, At Landing: UPI Dorpn indication, Push Button. Digital car position indication</p> <p>Driving Rops Ropes with factor of safoy 12 or above</p> <p>Car Ventilation With automatic ON/OFF Fan</p> <p>Car Lighting LED lighting.</p> <p>Leveling Accuracy Max as per article of 10 of IS 14665:2000, Min+ - 1MM</p> <p>Drive Fuji or Equivalent</p> <p>Strainless Steel Sheet Sail/Jindal/Imported</p> <p>Mild Steel Sheets Tata/Esser/Imported</p> <p>Features Overloaded</p>	Nos.	2			
Total Amount (Excluding Taxes)						

V. 125 KVA DIESEL GENERATOR SET

Sl.	Description	Unit	Qty.	Rate in INR (Taxes extra)		Total Amount in INR (Taxes extra)
				In Figures	In Words	
1.	<p>Supplying including installation, testing and commissioning of Water Cooled Jackson Diesel Generator set coupled to suitable alternator of 415 V, AC, 3-Phase 0.8 p.f.(la mounted on a 1) M.S. Fabricated base frame.,2) M.S. fuel tank of required capacity.,3) Residual Silencer.,4) AMF/Standard Control Panel.5) Suitable batteries with lead.,5) First fill of lube oil.,6) Acoustic Enclosure complete with all accessories as specified and directed by the department conforming to IS comprising the following Technical Specification.. (RANGE FROM 15 KVA TO 625 KV</p> <p>TECHNICAL DATA CJ125D5P GENERATOR SET SPECIFICATIONS 125/100 3. No. of Phases. 3 phase. 4. POWER FACTOR 0.8 LAG JACKSON ENGINE SPECIFICATION. 1. make). Cummins 2. Model. 6BTAA5.9G3 3. No. of Cylinders. 6 4. Aspiration. TURBO CHARGED AIR COOLED 5. Cooling. Water Cooled. 6. Governor. Mechanical 7. Battery Capacity Rating. 12 Volt. 8. FUEL CONSUMPTION LTR/HR @ 75% LOAD 20.8 ALTERNATOR SPECIFICATION. 1. make). CGT (STAMFOR 2. Voltage Regulation. +/- 1.0% 3. Insulation. Class - H. 4. Standard Enclosure. IP 23 5. No. of Phases. 3</p>					
	WITH STANDARD CONTROL PANEL	Each	1			
Total Amount (Excluding Taxes)						

Environmental, Social, Health and Safety (ESHS) Cost Schedule

Contractor's accepted Price Schedule (BoQ) shall be deemed to include the cost for adhering to the mandatory ESHS provisions included in the bid document and nothing extra shall be payable.

Technical Proposal

The Employer will specify, for each section of the technical proposal as listed below, the information and details that the Bidder must provide in its Bid.

- a) Alternative Technical Solutions – NOT APPLICABLE TO THIS NPC
- b) Environmental, Social, Health and Safety (ESHS) methodology
- c) List of Subcontractors
- d) Site Organization and Method Statement
- e) Construction Schedule
- f) Personnel proposed (forms PER-1 and PER-2)
- g) Equipment proposed (form EQU)

Alternative Technical Solutions

**Proposal for the Parts of the Works for which
Alternative Technical Solutions are permitted**

Item	Description of the Requirement	Description of the Proposed Alternative Technical Solution¹	Benefits to the Employer
NOT APPLICABLE TO THIS NPC			

¹ The Description of the proposed Alternative Technical Solution should be complete and should include as an attachment any documentation necessary for evaluation as indicated in ITB 13.3.

Environmental, Social, Health and Safety (ESHS) Methodology

The Bidder shall provide an ESHS Methodology providing information on how the Bidder shall meet the requirements and objectives specified in Section VII - Works Requirements - ESHS Specifications.

The ESHS Methodology submitted shall include a preliminary draft of the Worksite Environmental and Social Management Plan (Worksite - ESMP), the content of which is detailed in Appendix 1 to ESHS Specifications.

In order to address the highly sensitive ESHS issues highlighted during the project's environmental and social impact assessment, **the ESHS Methodology shall provide detailed information on the management of the items listed in the table of paragraph 1. "Essential ESHS issues of worksite management" in Section VII - Works Requirements.** The purpose is for the Bidder to provide a concrete ESHS methodology adapted to the worksite environment.

Note: A Bid for which the ESHS Methodology is evaluated as non-substantially responsive (i.e. with material deviation, reservation or omission) to the ESHS Specifications shall be rejected.

List of Subcontractors

Proposed Subcontractors for Key Activities/Sub-Activities

The following subcontractors and/or manufacturers are proposed for carrying out the key activity/sub-activity indicated.

Key Activity/Sub-Activity	Proposed Subcontractor	Nationality

Bidders shall submit an undertaking from the proposed subcontractor to confirm that they have read, understand and will comply with the ESHS obligations using the form hereby attached.

Form of Subcontractor ESHS Undertaking

Date: _____

Bid No.: _____

Alternative No.: _____

Contract title: *[insert the name of the Contract]*

To: *[insert the name of the Employer's agency]*

We, the undersigned, confirm that we have read, understand and will comply with the ESHS Specifications for the above-mentioned contract.

Name of the proposed subcontractor: _____

Name and title of the person signing this undertaking on behalf of the subcontractor: _____

[Signature of the person named above]

[Date signed]

Name of the person duly authorized to sign the Bid on behalf of the Bidder: _____

Title of the person signing the Bid: _____

Signature of the person named above: _____

Date signed (day/month/year): _____

Site Organization and Method Statement

Each Bidder shall set out details of the Site Organization and Method Statement for the Works to demonstrate how it will meet the Employer's objective and requirements. As a minimum, the Method Statement shall address the following:

- a) Details of the arrangements and methods which the Bidder proposes to implement for the construction of the Works, in sufficient detail to demonstrate their adequacy to achieve the requirements of the Contract including completion within the Time for Completion stated in the Particular Conditions of Contract;
- b) Outline of the arrangements of the Bidder to manage coordination of Site access
- c) Comments on the geotechnical and subsurface aspects of the Works including materials, material sources and any constraints- NOT APPLICABLE
- d) Comments on any offshore or waterfront aspects of the Works - NOT APPLICABLE
- e) Comments on logistics and traffic management - NOT APPLICABLE
- f) Outline of the arrangements and organization of the Bidder to ensure compliance with the Works Requirements;
- g) Outline of the arrangements of the Bidder to carry out testing upon completion as specified in the Works Requirements;
- h) When alternative technical solutions are permitted for the parts of the Works specified in Section VII - Works Requirements, a full description, including all documentation necessary for the evaluation, as listed in ITB 13.3, will be provided- NOT APPLICABLE.

Construction Schedule

Each Bidder shall set out a detailed Program and Schedule for mobilization and construction of the Works to be performed, including estimated starting and finishing dates for individual components and identification of major milestones and critical path. The proposed Program and Schedule shall be developed according to Works Requirements and shall address the following:

- a) Details of the proposed schedule for obtaining permits that may be necessary in order to commence the Works, including the preparation of required studies, supporting information, and applications.
- b) Details of the proposed timeline for carrying out the Works within the Time for Completion, in the form of a bar chart showing notably the critical path.
- c) Details of the proposed timeline for the testing, commissioning and handing over of the completed Works.

Personnel

Form PER-1: Proposed Personnel

Bidders should provide the names of suitably qualified personnel to meet the specified requirements stated in Section III, Evaluation and Qualification Criteria. The data on their experience should be supplied using the Form below for each candidate.

1.	Title of position(*)
	Name
2.	Title of position(*)
	Name
3.	Title of position(*)
	Name
4.	Title of position(*)
	Name
...	...
	...

(*): As listed in Section III, Evaluation and Qualification Criteria.

Form PER-2: Resume of Proposed Personnel

Name of Bidder: _____

Position: _____

Personnel information	Name: _____	Date of birth: _____
	Professional qualifications: _____ _____	
Present employment	Name of employer: _____	
	Address of employer: _____ _____	
	Telephone: _____	Contact (manager / personnel officer): _____
	Fax: _____	Email: _____
	Job title: _____ _____	Years with present employer: __

Summarize professional experience over the last 15/10 years, in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

From	To	Company / Project / Position / Relevant technical and management experience

Bidders Qualification Forms

To establish its qualifications to perform the contract in accordance with Section III, Evaluation and Qualification Criteria, the Bidder shall provide the information requested in the corresponding Information Sheets included hereunder.

Note:

The texts shown in *italics* in the Forms are meant to provide guidance to the Bidder for filling up the details/ information required by the Employer. These texts in italics shall be deleted by the Bidder while filling up the Forms

Form: ELI-1.1

Bidder Information Form

Date: *[Insert day, month, year]*
NPC No. and title: *[Insert IPC number and title]*
Page *[insert number]* of *[insert total number]* pages

Bidder's name: _____ <i>[insert full name]</i>
In case of Joint Venture (JV), name of each member: _____ <i>[insert full name of each member in JV]</i>
In case of a JV, Bidder's actual or intended country of constitution: _____ <i>[indicate country of constitution]</i>
Bidder's actual or intended year of constitution: _____ <i>[indicate year of constitution]</i>
Bidder's legal address (in country of constitution): _____ <i>[insert street / number / town or city / country]</i>
Bidder's Permanent Account Number (PAN): _____
Bidder's GST Registration Number: _____
Bidder's EPF Registration Number: _____
Bidder's ESIC Registration Number: _____
Bidder's authorized representative information: Name: _____ <i>[insert full name]</i> Address: _____ <i>[insert street / number / town or city / country]</i> Telephone/Fax numbers: _____ <i>[insert telephone/fax numbers, including country and city codes]</i> Email address: _____ <i>[indicate email address]</i>
1. Attached are copies of original documents of: <input type="checkbox"/> Articles of Constitution (or equivalent documents of association) of the legal entity named above; <input type="checkbox"/> In case of JV, letter of intent to form JV or JV agreement, in accordance with ITB 4.1; <input type="checkbox"/> In case of State-owned enterprise or institution, in accordance with ITB 4.3, documents establishing: <ul style="list-style-type: none">• Legal and financial autonomy;• Operation under commercial law;• Establishing that the Bidder is not a dependent agency of the Employer.
2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.
3. PAN card; GST Registration, PF Registration and ESIC Registration Certificates.

Form: ELI-1.2
Bidder's JV Information Form

[The following table shall be filled by each member of a Joint Venture and, if applicable, by any specialized subcontractor, and in that case substitute "Bidder's JV member" for "specialized subcontractor".]

Date: *[Insert day, month, year]*
NPC No. and title: *[Insert IPC number and title]*
Page *[insert number]* of *[insert total number]* pages

Bidder's JV name: _____ <i>[insert full name]</i>
Bidder's JV member's name: _____ <i>[insert full name Bidder's JV Member]</i>
Bidder's JV member's country of constitution: _____ <i>[indicate country of constitution]</i>
Bidder's JV member's year of constitution: _____ <i>[indicate year of constitution]</i>
Bidder's JV member's legal address (in country of constitution): _____ <i>[insert street / number / town or city / country]</i>
Bidder's Permanent Account Number (PAN): _____
Bidder's GST Registration Number: _____
Bidder's EPF Registration Number: _____
Bidder's ESIC Registration Number: _____
Bidder's JV member's authorized representative information: Name: _____ <i>[insert full name]</i> Address: _____ <i>[insert street / number / town or city / country]</i> Telephone/Fax numbers: _____ <i>[insert telephone/fax numbers, including country and city codes]</i> Email address: _____ <i>[indicate email address]</i>
<ol style="list-style-type: none">1. Attached are copies of original documents of:<ul style="list-style-type: none"><input type="checkbox"/> Articles of Constitution (or equivalent documents of association) of the legal entity named above;<input type="checkbox"/> In case of State-owned enterprise or institution, in accordance with ITB 4.3, documents establishing:<ul style="list-style-type: none">• Legal and financial autonomy;• Operation under commercial law;• Establishing that the Bidder is not a dependent agency of the Employer.2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.3. PAN card; GST Registration, PF Registration and ESIC Registration Certificates.

Form: CON-2

**Historical Contract Non-Performance, Pending
Litigation and Litigation History**

[The following table shall be filled in for the Bidder and for each member of a Joint Venture]

Bidder's Name: *[insert full name]*
 Date: *[insert day, month, year]*
 JV Member's Name: *[insert full name]*
 NPC No. and title: *[insert IPC number and title]*
 Page *[insert page number]* of *[insert total number]* pages

**Non-Performed Contracts in accordance with Section
III - Evaluation and Qualification Criteria**

- Contract non-performance did not occur since 1st January *[insert current year number less 5]* specified in Section III, Evaluation and Qualification Criteria, criterion 2.1.
- Contract(s) not performed since 1st January *[insert current year number less 5]* specified in Section III, Evaluation and Qualification Criteria, criterion 2.1, as indicated below:

Year	Non-performed portion of contract	Contract Identification	Total Contract Amount (INR)
<i>[insert year]</i>	<i>[insert amount and percentage]</i>	Contract Identification: <i>[indicate complete contract name/ number, and any other identification]</i> Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street / number / city of town / country]</i> Reason(s) for non-performance: <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>

Pending Litigation, in accordance with Section III - Evaluation and Qualification Criteria

- No pending litigation in accordance with Section III, Evaluation and Qualification Criteria, criterion 2.3
- Pending litigation in accordance with Section III, Evaluation and Qualification Criteria, criterion 2.3, as indicated below:

Year of dispute	Amount in dispute (currency)	Contract Identification	Total Contract Amount (INR)
<i>[insert year]</i>	<i>[insert amount]</i>	Contract Identification: <i>[Indicate complete contract name, number, and any other identification]</i> Name of Employer: <i>[Insert full name]</i> Address of Employer: <i>[Insert street / number / city of town / country]</i> Matter in dispute: <i>[Indicate main issues in dispute]</i> Party who initiated the dispute: <i>[Indicate "Employer" or "Contractor"]</i> Status of dispute: <i>[Indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary]</i>	<i>[insert amount]</i>
<i>[insert year]</i>	<i>[insert amount]</i>	<i>[insert amount]</i>
.....

Form: FIN – 3.1

Financial Situation and Performance

[The following table shall be filled in for the Bidder and for each member of a Joint Venture.]

Bidder's Name: *[insert full name]*

Date: *[insert day, month, year]*

JV Member's Name: *[insert full name]*

NPC No. and title: *[insert IPC number and title]*

Page *[insert page number]* of *[insert total number]* pages

1. Financial data

Type of Financial information in Indian Rupee (INR) Equivalent	Historic information for previous Three (3) years (amount in INR equivalent)		
	2020-21	2019-20	2018-19
Statement of financial position (information from balance sheet)			
Total assets (TA)			
Total financial liabilities ¹			
Total equity/Net worth (NW)			
Current assets			
Current liabilities			
Working capital (WC)			
Information from income statement			
Total revenue			
Earnings before interest, taxes, depreciation, and amortization (EBITDA) ²			
Earnings before taxes (EBT)			
Cash flow information			
Cash flow from operating activities			

2. Financial documents

The Bidder and in case of a JV, each member shall provide copies of financial statements for **three (3)** years pursuant Section III - Evaluation and Qualifications Criteria, criterion 3.1. The financial statements shall:

- a) Reflect the financial situation of the Bidder or in case of a JV, each member, and not an affiliated entity (such as parent company or group member);
 - b) Be independently audited or certified in accordance with local legislation;
 - c) Be complete, including all notes to the financial statements;
 - d) Correspond to accounting periods already completed and audited.
- Attached are copies of financial statements for the **three (3)** years required above and complying with the requirements

¹ Means any financial indebtedness for and in respect of:

- a) any monies borrowed on a short, medium or long-term basis;
- b) any bank overdraft;
- c) any amounts raised pursuant to any bills of exchange issued to a third party (or any dematerialized equivalent of such instrument);
- d) any amounts raised pursuant to any note purchase facility or the issue of bonds, notes, debentures, loan stock or any similar instruments;
- e) the amount of any liability in respect of any lease or hire purchase contract which would be treated as a finance or capital lease;
- f) receivables sold or discounted (other than any receivables to the extent they are sold on a non-recourse basis).

² Means, for any given year, the aggregate of:

- (+) net income
- (+) tax expense
- (+/-) extraordinary income or expense
- (+/-) financial result
- (+/-) net foreign exchange losses or gains
- (+) net depreciation and amortization allowances and provisions

Form FIN-3.2:

Annual Turnover

[The following table shall be filled in for the Bidder and for each member of a Joint Venture]

Bidder's Name: [insert full name]

Date: [insert day, month, year]

JV Member's Name: [insert full name]

NPC No. and title: [insert IPC number and title]

Page [insert page number] of [insert total number] pages

Year	Annual turnover data		
	Amount and currency ¹	Exchange rate	Indian Rupee (INR) equivalent
[Indicate financial year]	[insert amount and indicate currency, if different from INR, or else insert amount in INR]	[insert exchange rates used to calculate the INR equivalent or else insert "Not Applicable" (N/A)]	[insert INR equivalent]
2020-21			
2019-20			
2018-19			
		Average Annual Turnover²	

¹ The indicated turnover amounts must be identical as those appearing on the financial statements.

² See Section III, Evaluation and Qualification Criteria, criterion 3.2.

Form: FIN-3.3

Financial Resources

[The following table shall be filled in for the Bidder and all parties combined in case of a Joint Venture]

Specify proposed sources of financing, such as liquid assets³, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as specified in Section III - Evaluation and Qualification Criteria.

Financial Resources		
No.	Source of financing	Amount (INR equivalent)
1		
2		
3		
...		

³ Liquid Assets mean cash and cash equivalents, short-term financial instruments, short term available-for-sale-securities, marketable securities, trade receivables, short-term financing receivables and other assets that can be converted into cash within one year.

Form: FIN-3.4

Current Contract Commitments / Works in Progress

[Bidder (or each JV 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.]

Current Contract Commitments					
Sl. No.	Name of Contract	Employer's Contact Address, Telephone and Fax	Value of Outstanding Work (in INR)	Estimated Completion Date	Average Monthly Invoicing Over Last Six Months (INR/month)
1					
2					
3					
4					
...					

Form: EXP-4.1

General Construction Experience

[The following table shall be filled in for the Bidder and in the case of a JV Bidder, each Member]

Bidder's Name: *[insert full name]*
 Date: *[insert day, month, year]*
 JV Member's Name: *[insert full name]*
 NPC No. and title: *[insert IPC number and title]*
 Page *[insert page number]* of *[insert total number]* pages

[Identify contracts that demonstrate continuous construction work over the past ten (10) years pursuant to Section III, Evaluation and Qualification Criteria, criterion 4.1. List contracts chronologically, according to their commencement (starting) dates.]

Starting Year ⁴	Ending Year	Contract Identification	Role of Bidder
<i>[Indicate year]</i> _____	<i>[Indicate year]</i> _____	Contract name: <i>[insert full name]</i> Brief Description of the Works performed by the Bidder: <i>[describe works performed briefly]</i> Amount of contract: <i>[insert amount in INR equivalent]</i> Name of Employer: <i>[indicate full name]</i> Address: <i>[indicate street/number/town or city/country]</i>	<i>[insert "Prime Contractor" or "JV Member" or "Subcontractor" or "Management Contractor"]</i> _____
...
...
...
...

⁴ See Section III, Evaluation and Qualification Criteria, criterion 4.1.

Form: EXP-4.2(a)

Specific Construction and Contract Management Experience

[The following table shall be filled in for contracts performed by the Bidder or each member of a Joint Venture]

Bidder's Name: *[insert full name]*
 Date: *[insert day, month, year]*
 JV Member's Name: *[insert full name]*
 NPC No. and title: *[insert IPC number and title]*
 Page *[insert page number]* of *[insert total number]* pages

Similar Contract No. <i>[insert number] of [insert number of similar contracts required]</i>	Information	
Contract Identification:	_____ <i>[Insert contract name and number, if applicable]</i>	
Award Date:	_____ <i>[Insert day, month, year, e.g., 15 June, 2017]</i>	
Completion Date:	_____ <i>[Insert day, month, year, e.g., 03 October, 2017]</i>	
Role in Contract: <i>[check the appropriate box]</i>	<input type="checkbox"/> Prime Contractor	<input type="checkbox"/> Member in JV
	<input type="checkbox"/> Management Contractor	<input type="checkbox"/> Subcontractor
Total Contract Amount:	_____ <i>[Insert total contract amount in INR]</i>	
If member is a JV or subcontractor, specify participation in total Contract amount:	_____ % <i>[Insert a percentage amount]</i>	_____ <i>[Insert total contract amount in INR]</i>
Employer's Name:	_____ <i>[Insert full name]</i>	
Address:	_____ <i>[Indicate street / number / town or city / country]</i>	
Telephone/Fax numbers:	_____ <i>[Insert telephone/fax numbers, including country and city area codes]</i>	
Email:	_____ <i>[Insert email address, if available]</i>	

Form: EXP-4.2(a) (Cont.):

Specific Construction and Contract Management Experience (cont.)

Bidder's Name: *[insert full name]*
 JV Member's Name: *[insert full name]*

Similar Contract No. <i>[insert number] of [insert number of similar contracts required]</i>	Information
Description of the similarity in accordance with criterion 4.2(a) of Section III - Evaluation and Qualification Criteria:	
1. Amount	_____ <i>[insert amount in INR in words and in figures]</i>
2. Physical size of required works items	_____ <i>[Insert physical size of items]</i>
3. Complexity	_____ <i>[Insert description of complexity]</i>
4. Methods/Technology	_____ <i>[Insert specific aspects of the methods/technology involved in the Contract]</i>
5. Construction rate for key activities	_____ <i>[Insert rates and items]</i>
6. Other Characteristics	_____ <i>[Insert other characteristics, as described in Section VII - Works Requirement – Scope of Works]</i>

Form EXP-4.2 (b):

Construction Experience in Key Activities

Bidder's Name: *[insert full name]*

Date: *[insert day, month, year]*

JV Member's Name: *[insert full name]*

Subcontractor's Name¹ (as per ITB 34.2 and 34.4): *[insert full name]*

NPC No. and title: *[insert IPC number and title]*

Page *[insert page number]* of *[insert total number]* pages

1. Key Activity No. 1: *[insert brief description of the activity, emphasizing its specificity]*

Information			
Contract Identification:	_____		
	<i>[Insert contract name and number, if applicable]</i>		
Award Date:	_____		
	<i>[Insert day, month, year, e.g. 15 June, 2017]</i>		
Completion Date:	_____		
	<i>[Insert day, month, year, e.g. 03 October, 2017]</i>		
Role in Contract: <i>[Check the appropriate box]</i>	<input type="checkbox"/> Prime Contractor	<input type="checkbox"/> Member in JV	<input type="checkbox"/> Management Contractor
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Contract Amount:	_____		
	<i>[Insert total contract amount in INR]</i>		
Quantity (Volume, number or rate of production, as applicable) performed under the contract per year or part of the year:	Total Quantity in the Contract/ Job (i)	Percentage Participation ² (ii)	Actual Quantity Performed (i) x (ii)
Year 1			
Year 2			
Year 3			
Employer's Name:	_____		
	<i>[Insert full name]</i>		
Address:	_____		
	<i>[Indicate street / number / town or city / country]</i>		
Telephone/Fax numbers:	_____		
	<i>[Insert telephone/fax numbers, including country and city area codes]</i>		
Email:	_____		
	<i>[Insert email address, if available]</i>		
Description of the key activities in accordance with criterion 4.2(b) of Section III - Evaluation and Qualification Criteria:			
	<i>[insert response to inquiry indicated in left column]</i>		

2. Key Activity No. 2: *[insert brief description of the activity, emphasizing its specificity and tabulate the information required as above]*

3. Key Activity No. 3 & so on: *[insert brief description of the activity, emphasizing its specificity and tabulate the information required as above]*

¹ If permitted by the Employer under "specialized works" (criterion 4.2(b) in the table of the Qualification Criteria of Section III, Evaluation and Qualification Criteria.
² In case of participation as a JV member insert the percentage stake in the JV, otherwise 100%.

Form CER

Quality Management / Environmental, Social, Health and Safety (ESHS) Certification

Bidder's Name: *[insert full name]*

Date: *[insert day, month, year]*

JV Member's Name: *[insert full name]*

NPC No. and title: *[insert IPC number and title]*

Page *[insert page number]* of *[insert total number]* pages

Certification *[Quality / Environmental / Health and Security]*
[Delete as appropriate]

DESCRIPTION	INFORMATIONS
Identification of the certificate:	_____ <i>[Insert full name of the certificate]</i>
Date of Issue ³ :	_____ <i>[Insert day, month, year of first certificate award]</i>
Areas covered by the certificate:	_____ <i>[Insert activities and locations]</i>
Expiry Date:	_____ <i>[Insert day, month, year]</i>
Issuer's Name:	_____ <i>[Insert full name]</i>
Address:	_____ <i>[Insert street / number / town or city / country]</i>
Telephone/Fax numbers:	_____ <i>[Insert phone/fax numbers, including country and city area codes]</i>
Email:	_____ <i>[Insert email address, if available]</i>
Compliance with international standards:	The certificate is <i>[ISO 9001, ISO 14001, ISO 45001]</i> <i>[select as appropriate]</i> <input type="checkbox"/> Yes / <input type="checkbox"/> No
If no, proof of conformity with ISO standards by the Bidder:	The Bidder shall provide a conformity assessment of its certificate by an internationally recognized Accredited Certification Body.

The Bidder shall fill this Form for each Certification required under criterion 5.1 of Section III, Evaluation and Qualification Criteria

³ Date of issue must be prior to the date of the IFB for this IPC

Form EXP- ESHS

Environment, Social, Health and Safety (EHSE) Experience

Bidder's Name: *[insert full name]*

Date: *[insert day, month, year]*

JV Member's Name: *[insert full name]*

NPC No. and title: *[insert IPC number and title]*

Page *[insert page number]* of *[insert total number]* pages

Similar Contract No: <i>[insert number] of [insert number of similar contracts required]</i>	Information								
Contract Identification:	<div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <i>[Insert contract name and number, if applicable]</i>								
Short Project Description (main scope and key values of project):	<div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <i>[Insert short project description]</i>								
Award Date:	<div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <i>[Insert day, month, year]</i>								
Completion Date:	<div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <i>[Insert day, month, year]</i>								
Role in contract: <i>[Check the appropriate box]</i>	<table style="width: 100%; border: none;"> <tr> <td style="text-align: center; width: 25%;"><input type="checkbox"/></td> <td style="text-align: center; width: 25%;"><input type="checkbox"/></td> <td style="text-align: center; width: 25%;"><input type="checkbox"/></td> <td style="text-align: center; width: 25%;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;">Prime Contractor</td> <td style="text-align: center;">Member in JV</td> <td style="text-align: center;">Management Contractor</td> <td style="text-align: center;">Subcontractor</td> </tr> </table>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Prime Contractor	Member in JV	Management Contractor	Subcontractor
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Prime Contractor	Member in JV	Management Contractor	Subcontractor						
Total Contract Amount:	<div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <i>[Insert total contract amount in INR]</i>								
If party in a JV or subcontractor, specify participation of Total Contract Amount:	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;"> <div style="border-bottom: 1px solid black; height: 15px; width: 80%; margin: 0 auto;"></div> % <i>[Insert a percentage amount]</i> </td> <td style="width: 50%; text-align: center;"> <div style="border-bottom: 1px solid black; height: 15px; width: 80%; margin: 0 auto;"></div> <i>[Insert total contract amount in INR]</i> </td> </tr> </table>	<div style="border-bottom: 1px solid black; height: 15px; width: 80%; margin: 0 auto;"></div> % <i>[Insert a percentage amount]</i>	<div style="border-bottom: 1px solid black; height: 15px; width: 80%; margin: 0 auto;"></div> <i>[Insert total contract amount in INR]</i>						
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Employer's Name:	<div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <i>[Insert full name]</i>								
Address:	<div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <i>[Insert street / number / town or city / country]</i>								
Telephone/Fax numbers:	<div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <i>[Insert telephone / fax numbers, including country and city area codes]</i>								
Email:	<div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <i>[Insert email address, if available]</i>								
Description of the ESHS measures implemented under the contract: a) ESHS implemented measures (as per criterion 5.3 of Section III - Evaluation and Qualification Criteria)	<div style="border-bottom: 1px solid black; height: 15px; width: 100%;"></div> <i>[Provide a document supporting the adoption/implementation of HSE measures, acceptable to the Employer⁴]</i>								

⁴ For example, ESHS activity reports, ESHS final reports, ESHS inspection reports, supervision Engineer's reports, etc. Only documents evidencing adoption of ESHS measures shall be accepted.

Form for Bid Security

Demand Guarantee

Beneficiary: _____

Invitation for Bids No.: _____

Date: _____

Bid Guarantee No.: _____

Guarantor: _____

We have been informed that _____ (hereinafter called "**the Bidder**") has submitted or will submit to the Beneficiary its bid (hereinafter called "**the Bid**") for the execution of _____ under Invitation for Bids No. _____ ("**the IFB**").

Furthermore, we understand that, according to the Beneficiary's conditions, Bids must be supported by a Bid guarantee.

At the request of the Bidder, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of INR _____ (Indian Rupees _____ only) upon receipt by us of the Beneficiary's first demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Bidder:

- a) Has withdrawn its Bid during the period of Bid validity set forth in the Bidder's Letter of Bid ("the Bid Validity Period"), or any extension thereto provided by the Bidder; or
- b) Having been notified of the acceptance of its Bid by the Beneficiary during the Bid Validity Period or any extension thereto provided by the Bidder, (i) has failed to execute the contract agreement, or (ii) has failed to furnish the performance security, in accordance with the Instructions to Bidders ("**ITB**") of the Beneficiary's Bidding Documents.

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 the Beneficiary in relation to such contract agreement; or
- b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Bidder of the results of the bidding process; or (ii) twenty-eight days after the end of the Bid Validity Period.

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

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758.

_____ [Signature(s)]

Form of Bid-Securing Declaration

Date: _____

Bid No.: _____

Alternative No.: _____

To: _____

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 entity that invited Bids for the period of time of _____ starting on _____, 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 Bid or any extension thereto accepted by us; or
- b) Having been notified of the acceptance of our Bid by the Employer during the period of Bid validity or any extension thereto accepted by us, (i) fail or refuse to execute the Contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the ITB.

We understand this Bid-Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of:

- a) our receipt of your notification to us of the name of the successful Bidder; or
- b) twenty-eight days after the expiration of our Bid.

Name of the Bidder¹: _____

Name of the person duly authorized to sign the Bid on behalf of the Bidder²: _____

Title of the person signing the Bid: _____

Signature of the person named above: _____

Date signed: _____ day of: _____

[Note: In case of a Joint Venture, the Bid-Securing Declaration must be in the name of all members of the Joint Venture that submits the Bid.]

¹ In the case of the Bid submitted by joint venture specify the name of the Joint Venture as Bidder.

² Person signing the Bid shall have the power of attorney given by the Bidder attached to the Bid.

Section V – Eligibility Criteria

Eligibility in AFD-Financed Procurement

1. Financing allocated by AFD to a Contracting Authority has been entirely untied since 1st January 2002. To the exception of any equipment or any sector which is subject to an embargo by the United Nations, the European Union or France, all goods, works, plants, consulting services and non-consulting services are eligible for AFD financing regardless of the country of origin of the supplier, contractor, subcontractor, consultant or subconsultant inputs or resources used in the implementation processes. The Contracting Authority means the Purchaser, the Employer, the Client, as the case may be, for the procurement of goods, works, plants, consulting services or non-consulting services.
2. Natural or legal Persons¹ (including all members of a joint venture or any of their suppliers, contractors, subcontractors, consultants or subconsultants) shall not be awarded an AFD-financed contract if, on the date of submission of an application, a bid or a proposal, or on the date of award of a contract, they:
 - 2.1 Are bankrupt or being wound up or ceasing their activities, are having their activities administered by the courts, have entered into receivership, or are in any analogous situation arising from a similar procedure;
 - 2.2 Have been:
 - a) convicted, within the past five years by a court decision, which has the force of res judicata in the country where the contract is implemented, of fraud, corruption or of any other offense committed during a procurement process or performance of a contract, unless they provide supporting information together with their Statement of Integrity (Form available as Appendix to the Application, Bid or Proposal Submission Form) which shows that this conviction is not relevant in the context of the Contract;
 - b) subject to an administrative sanction within the past five years by the European Union or by the competent authorities of the country where they are constituted, for fraud, corruption or for any other offense committed during a procurement process or performance of a contract, unless they provide supporting information together with their Statement of Integrity (Form available as Appendix to the Application, Bid or Proposal Submission Form) which shows that this sanction is not relevant in the context of the Contract;
 - c) convicted, within the past five years by a court decision, which has the force of res judicata, of fraud, corruption or of any other offense committed during the procurement process or performance of an AFD-financed contract;
 - 2.3 Are listed for financial sanctions by the United Nations, the European Union and/or France for the purposes of fight-against-terrorist financing or threat to international peace and security;
 - 2.4 Have been subject within the past five years to a contract termination fully settled against them for significant or persistent failure to comply with their contractual obligations during contract performance, unless this termination was challenged and dispute resolution is still pending or has not confirmed a full settlement against them;
 - 2.5 Have not fulfilled their fiscal obligations regarding payments of taxes in accordance with the legal provisions of either the country where they are constituted or the Contracting Authority's country;
 - 2.6 Are subject to an exclusion decision of the World Bank and are listed on the website <http://www.worldbank.org/debarr>, unless they provide supporting information together with their Statement of Integrity (Form available as Appendix to the Application, Bid or Proposal Submission Form) which shows that this exclusion is not relevant in the context of the Contract;
 - 2.7 Have created false documents or committed misrepresentation in documentation requested by the Contracting Authority as part of the procurement process of the Contract.
3. State-owned entities may compete only if they can establish that they (i) are legally and financially autonomous, and (ii) operate under commercial law. To be eligible, a state-owned entity shall establish to AFD's satisfaction, through all relevant documents, including its Charter and other information AFD may request, that it: (i) is a legal entity separate from their state (ii) does not currently receive substantial subsidies or budget support; (iii) operates like any commercial enterprise, and, inter alia, is not obliged to pass on its surplus to their state, can acquire rights and liabilities, borrow funds and be liable for repayment of its debts, and can be declared bankrupt.

¹ Means any Person whether natural or legal, firm, company, corporation, government, state or state agency or any association, or group of two or more of the foregoing (whether or not having separate legal status).

Section VI –AFD Policy – Corrupt and Fraudulent Practices - Environmental and Social Responsibility

1. Corrupt and Fraudulent Practices

The Contracting Authority and the suppliers, contractors, subcontractors, consultants or subconsultants must observe the highest standard of ethics during the procurement process and performance of the contract. The Contracting Authority means the Purchaser, the Employer, the Client, as the case may be, for the procurement of goods, works, plants, consulting services or non-consulting services.

By signing the Statement of Integrity the suppliers, contractors, subcontractors, consultants or subconsultants declare that (i) “it did not engage in any practice likely to influence the contract award process to the Contracting Authority’s detriment, and that it did not and will not get involved in any anti-competitive practice”, and that (ii) “the procurement process and the performance of the contract did not and shall not give rise to any act of corruption or fraud”.

Moreover, AFD requires including in the Procurement Documents and AFD-financed contracts a provision requiring that suppliers, contractors, subcontractors, consultants or subconsultants will permit AFD to inspect their accounts and records relating to the procurement process and performance of the AFD-financed contract, and to have them audited by auditors appointed by AFD.

AFD reserves the right to take any action it deems appropriate to check that these ethics rules are observed and reserves, in particular, the rights to:

- a) Reject a proposal for a contract award if it is established that during the selection process the bidder or consultant that is recommended for the award has been convicted of corruption, directly or by means of an agent, or has engaged in fraud or anti-competitive practices in view of being awarded the Contract;
- b) Declare mis-procurement when it is established that, at any time, the Contracting Authority, the suppliers, contractors, subcontractors, consultants or subconsultants their representatives have engaged in acts of corruption, fraud or anti-competitive practices during the procurement process or performance of the contract without the Contracting Authority having taken appropriate action in due time satisfactory to AFD to remedy the situation, including by failing to inform AFD at the time they knew of such practices.

AFD defines, for the purposes of this provision, the terms set forth below as follows:

- a) Corruption of a Public Officer means:
 - The act of promising, offering or giving to a Public Officer, directly or indirectly, an undue advantage of any kind for himself or for another Person¹ or entity, for such Public Officer to act or refrain from acting in his official capacity; or
 - The act by which a Public Officer solicits or accepts, directly or indirectly, an undue advantage of any kind for himself or for another Person or entity, for such Public Officer to act or refrain from acting in his official capacity.
- b) A Public Officer shall be construed as meaning:
 - Any person who holds a legislative, executive, administrative or judicial mandate (within the country of the Contracting Authority) regardless of whether that natural Person was nominated or elected, regardless of the permanent or temporary, paid or unpaid nature of the position and regardless of the hierarchical level the natural Person occupies;
 - Any other natural Person who performs a public function, including for a State institution or a State-owned company, or who provides a public service;
 - Any other natural Person defined as a Public Officer by the national laws of the country of the Contracting Authority.
- c) Corruption of a Private Person² means:
 - The act of promising, offering or giving to any Private Person, directly or indirectly, an undue advantage of any kind for himself or for another Person or entity, for such Private Person to perform or refrain from performing any act in breach of its legal, contractual or professional obligations; or;

¹ Means any Person whether natural or legal, firm, company, corporation, government, state or state agency or any association, or group of two or more of the foregoing (whether or not having separate legal status).

² Means any natural Person other than a Public Officer.

- The act by which any Private Person solicits or accepts, directly or indirectly, an undue advantage of any kind for himself or for another Person or entity, for such Private Person to perform or refrain from performing any act in breach of its legal, contractual or professional obligations.
- d) Fraud means any dishonest conduct (act or omission), whether or not it constitutes a criminal offence, deliberately intended to deceive others, to intentionally conceal items, to violate or vitiate consent, to circumvent legal or regulatory requirements and/or to violate internal rules in order to obtain illegitimate profit.
- e) Anti-competitive practices mean:
 - Any concerted or implied practices which have as their object or effect the prevention, restriction or distortion of competition within a marketplace, especially where they (i) limit access to the marketplace or free exercise of competition by other undertakings, (ii) prevent free, competition-driven price determination by artificially causing price increases or decreases, (iii) restrict or control production, markets, investments or technical progress; or (iv) divide up market shares or sources of supply;
 - Any abuse by one undertaking or a group of undertakings which hold a dominant position on an internal market or on a substantial part of it;
 - Any practice whereby prices are quoted or set unreasonably low, the object of which is to eliminate an undertaking or any of its products from a market or to prevent it from entering the market.

2. Environmental and Social Responsibility

In order to promote sustainable development, AFD seeks to ensure that internationally recognized environmental and social standards are complied with. Suppliers, contractors, subcontractors, consultants or subconsultants for AFD-financed contracts shall consequently undertake in the Statement of Integrity to:

- a) Comply with and ensure that all their subcontractors or subconsultants comply with international environmental and labour standards, consistent with applicable law and regulations in the country of implementation of the contract, including the fundamental conventions of the International Labour Organization (ILO) and international environmental treaties;
- b) Implement environmental and social risks mitigation measures when specified in the environmental and social management plan (ESMP) provided by the Contracting Authority.

PART 2 - Works Requirements

Section VII – Works Requirements

Contents

- 1. SPECIFICATIONS**
 - Technical Specifications
 - Specifications for Environmental, Social, Health and Safety (ESHS) Management of the Works
- 2. DRAWINGS:** May be seen at the office of the tender inviting authority

TECHNICAL SPECIFICATIONS

1.1 Preamble

These Specifications cover the items of work in structural and non-structural parts of the Works coming under purview of this document. All work shall be carried out in conformation with this. In general, provisions of CPWD Specifications 2019, MoRTH Specifications for Roads and Bridge Works (IV Revision) and other national standards have been followed. These Specifications are not intended to cover the minute details. All Civil, Electrical & Plumbing work shall be executed in accordance with the aforesaid specifications incorporating best modern practices. All codes and standards referred to in these Specifications shall be the latest revision thereof.

0.0 GENERAL

0.0 Reference mentioned herein shall be applicable to all sections to the extent the context permits and are intended to supplement the provisions in the particular section. In case of any discrepancy/ deviation, the provisions in the particular section shall take precedence.

0.1 The rates for all items of work unless clearly specified otherwise shall include cost of all labour, materials and other inputs involved in the execution of the items.

0.2 FLOOR AND LEVELS

0.2.1 Building

0.2.1.1 Floor 1 is the lowest floor above the ground level in the building unless otherwise specified in a particular case. The floors above floor 1 shall be numbered in sequence as floor 2, floor 3 and so on. The number shall increase upwards.

0.2.1.2 Floor level: For floor 1, top level of finished floor shall be the floor level and for all other floors above floor 1, top level of the structural slabs shall be the floor level.

0.2.1.3 Plinth level: Floor 1 level or 1.2 m above the ground level whichever is lower shall be the plinth level.

0.3 MATERIALS

0.3.1 Samples of all materials to be used on the work shall be got approved by the contractor from the Engineer-in-Charge well in time. The approved samples duly authenticated and sealed shall be kept in the custody of the Engineer-in-Charge till the completion of the work. All materials to be provided by the contractor shall be brand new and as per the samples approved by the Engineer-in-Charge.

0.3.2 Materials obtained by the contractor from the sources approved by the Department shall be subjected to the Mandatory tests. Where such materials do not conform to the relevant specifications, the matter shall be taken up by the Engineer-in-Charge for appropriate action against the defaulters. In all such cases, necessary documents in original and proof of payment relating to the procurement of materials shall be made available by the contractor to the Engineer-in-Charge.

0.3.3 Samples, whether submitted for approval to govern bulk supplies or required for testing before use and also the sample of materials bearing 'Standard mark,' if required for testing, shall be provided free of cost by the contractor. All other incidental expenditure to be incurred for testing of samples e.g. packaging, sealing transportation, loading, unloading etc. except testing charges shall be borne by the contractor.

0.3.4 The materials, supplied by the Department shall be deemed to be complying with the specifications.

0.3.5 Materials stored at site, depending upon the individual characteristics, shall be protected from atmospheric effects due to rain, sun, wind and moisture to avoid deterioration.

0.0.1 Materials like timber, paints etc. shall be stored in such a way that there may not be any possibility of fire hazards. Inflammable materials and explosives shall be stored in accordance with the relevant rules and regulations or as approved by Engineer-in-Charge in writing so as to ensure desired safety during storage.

0.0.2 The unit weight of materials unless otherwise specified shall be reckoned as given in IS: 1911-1967.

0.1 SAFETY IN CONSTRUCTION

0.1.1 The contractor shall employ only such methods of construction, tools and plant as are appropriate for the type of work or as approved by Engineer-in-Charge in writing.

0.1.2 The contractor shall take all precautions and measures to ensure safety of works and workman and shall be fully responsible for the same. Safety pertaining to construction works such as excavation, centering and

shuttering, trenching, blasting, demolition, electric connections, scaffolds, ladders, working platforms, gangway, mixing of bituminous materials, electric and gas welding, use of hoisting and construction machinery shall be governed by CPWD safety code, relevant safety codes and the direction of Engineer-in-Charge.

1.0 CARRIAGE OF MATERIALS

1.0 GENERAL

The carriage and stacking of materials shall be done as directed by the Engineer-in-Charge. Any tools and plants, required for the work shall be arranged by the Contractor. The carriage of materials includes loading within a lead of 50 metres, unloading and stacking within a lead of 50 metres.

1.1 RESPONSIBILITY FOR LOSS OR DAMAGE

Loading, carriage, unloading and stacking shall be done carefully to avoid loss or damage to the materials. In case of any loss or damage, recovery shall be effected from the Contractor at twice the Departmental issue rates of the materials. If the departmental issue rates of the materials are not available then the recovery shall be effected at twice the prevailing market rates as determined by the Engineer-in-Charge.

1.2 MODE OF CARRIAGE

Depending upon the feasibility and economy, the Engineer-in-Charge shall determine the mode of carriage viz. whether by mechanical or animal transport or manual labour.

1.3 LEAD

1.3.1 All distances shall be measured over the shortest practical route and not necessarily the route actually taken. *Route other than shortest practical route may be considered in cases of unavoidable circumstances and as approved by Engineer-in-Charge alongwith reasons in writing.*

1.3.2 Carriage by manual labour shall be reckoned in units of 50 metres or part thereof.

1.3.3 Carriage by animal and mechanical transport shall be reckoned in one km unit. Distances of 0.5km or more shall be taken as 1 km and distance of less than 0.5 km shall be ignored. However, when the total lead is less than 0.5 km, it will not be ignored but paid for separately in successive stages of 50 metres subject to the condition that the rate worked on this basis does not exceed the rate for initial lead of 1 km by mechanical/ animal transport.

1.4 GENERAL CONSIDERATION FOR STACKING AND STORAGE

1.4.1 Planning of Storage Layout

For any site, there should be proper planning of the layout for stacking and storage of different materials, components and equipments with proper access and proper manoeuvrability of the vehicles carrying the material. While planning the layout, the requirements of various materials, components and equipments at different stages of construction shall be considered. The storage & stacking checklist is given in Table 1.1. For further details refer IS- 4082.

1.4.2 Material shall be stored in such a manner as to prevent deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for the work.

1.5 PROTECTION AGAINST ATMOSPHERIC AGENCIES

Materials stored at site, depending upon the individual characteristics, shall be protected from atmospheric actions, such as rain, sun, winds and moisture to avoid deterioration.

1.6 PROTECTION AGAINST FIRE AND OTHER HAZARDS

1.6.1 Materials like timber, coal, paints, etc. shall be stored in such a way that there may not be any possibility of fire hazards. Inflammable materials like kerosene and petrol, shall be stored in accordance with the relevant rules and regulations so as to ensure the desired safety during storage. Stacks shall not be piled so high as to make them unstable under fire fighting conditions and in general they shall not be more than 4.5 m in height. The provisions given in IS 13416 (part 5) shall be followed.

1.7 STACKING AND STORAGE OF MATERIALS

1.7.1 Cement

1.7.1.1 In case cement is received in bags. Cement shall be stored at the work site in a building or a shed which is dry, leakproof and as moisture proof as possible. The building or shed for storage should have minimum

number of windows and close fitting doors and these should be kept closed as far as possible.

1.7.1.2 Cement shall be stored and stacked in bags and shall be kept free from the possibility of any dampness or moisture coming in contact with them. Cement bags shall be stacked off the floor on wooden planks in such a way as to keep about 150 mm to 200 mm clear above the floor. The floor may comprise of lean cement concrete or two layers of dry bricks laid on well consolidated earth. A space of 600 mm minimum shall be left around between the exterior walls and the stacks.

In the stacks the cement bags shall be kept close together to reduce circulation of air as much as possible. Owing to pressure on the bottom layer of bags sometimes 'warehouse pack' is developed in these bags. This can be removed easily by rolling the bags when the cement is taken out for use. Lumbered bags, if any should be removed and disposed off.

1.7.1.3 The height of stack shall not be more than 10 bags to prevent the possibility of lumping up under pressure. The width of the stack shall be not more than four bags length or 3 metres. In stacks more than 8 bags high, the cement bags shall be arranged alternately length-wise and cross-wise so as to tie the stacks together and minimize the danger of topping over. Cement bags shall be stacked in a manner to facilitate their removal and use in the order in which they are received; a label showing date of receipt of cement shall be put on each stack to know the age of cement.

1.7.1.4 For extra safety during the monsoon, or when it is expected to store for an unusually long period, the stack shall be completely enclosed by a water proofing membrane such as polyethylene, which shall close on the top of the stack. Care shall be taken to see that the waterproofing membrane is not damaged any time during use.

1.7.1.5 Cement in gunny bags, paper bags and polyethylene bags shall be stored separately.

1.7.2 In case cement is received in drums

These shall be stored on plane level ground, as far as possible near the concrete mixing place. After taking out the required quantity of cement, the lid of the drum shall be securely tied to prevent ingress of moisture.

1.7.3 In case cement is received in silos

The silos shall be placed near the concrete batching plant. Proper access shall be provided for the replacement of silos.

1.7.4 Different types of cements shall be stacked and stored separately.

1.8 BRICKS

1.8.1 Bricks shall be stacked in regular tiers as and when they are unloaded to minimize breakage and defacement. These shall not be dumped at site.

1.8.2 Bricks stacks shall be placed close to the site of work so that least effort is required to unload and transport the bricks again by loading on pallets or in barrows. Building bricks shall be loaded or unloaded a pair at a time unless palletized. Unloading of building bricks or handling in any other way likely to damage the corners or edges or other parts of bricks shall not be permitted.

1.8.3 Bricks shall be stacked on dry firm ground. For proper inspection of quality and ease in counting the stacks shall be 50 bricks long, 10 bricks high and not more than 4 bricks in width, the bricks being placed on edge, two at a time along the width of the stack. Clear distance between adjacent stacks shall not be less than 0.8 m. Bricks of each truck load shall be put in one stack.

1.8.4 Bricks of different types, such as clay bricks, clay fly ash bricks, fly ash lime bricks, sand lime (calcium silicate) bricks, auto-clave bricks etc. shall be stacked separately. Bricks of different classification and size consideration (such as, conventional and modular) shall be stacked separately. Also bricks of different types, such as, solid, hollow and perforated shall be stacked separately.

1.9 BLOCKS

1.9.1 Blocks are available as hollow and solid concrete blocks, hollow and solid light weight concrete blocks, autoclaved aerated concrete blocks, concrete stone masonry blocks and soil-based blocks.

1.9.2 Blocks shall be unloaded one at a time and stacked in regular tiers to minimize breakage and defacement. These shall not be dumped at site. The height of the stack shall not be more than 1.2 m. The length of the stack shall not be more than 3.0 m, as far as possible and the width shall be of two or three blocks.

1.9.3 Normally blocks cured for 28 days only should be received at site. In case blocks cured for less than 28 days are received, these shall be stacked separately. All blocks should be water cured for 10 to 14 days

and air cured for another 15 days; thus no blocks with less than 28 days curing shall be used in building construction.

1.9.4 Blocks shall be placed close to the site of work so that least effort is required for their transportation.

1.9.5 Blocks manufactured at site shall be stacked at least for required minimum curing period as given in 1.9.3.

1.9.6 The date of manufacture of the blocks shall be suitably marked on the stacks of blocks manufactured at factory or site.

1.10 FLOOR, WALL AND ROOF TILES

1.10.1 Floor, wall and clay roof tiles of different types, such as, cement concrete tiles (plain, coloured and terrazzo) and ceramic tiles (glazed and unglazed) shall be stacked on regular platform as far as possible under cover in proper layers and in tiers and they shall not be dumped in heaps. In the stack, the tiles shall be so placed that the mould surface of one faces that of another. Height of the stack shall not be more than one metre. During unloading, these shall be handled carefully so as to avoid breakage.

1.10.2 Tiles of different quality, size and thickness shall be stacked separately to facilitate easy removal for use in work. Tiles when supplied by manufacturers packed in wooden crates, shall be stored in crates. The crates shall be opened one at a time as and when required for use.

1.10.3 Ceramic tiles and clay roof tiles are generally supplied in cartons which shall be handled with care. It is preferable to transport these at the site on platform trolleys.

1.11 AGGREGATES

1.11.1 Aggregates shall be stored at site on a hard dry and level patch of ground. If such a surface is not available, a platform of planks or old corrugated iron sheets, or a floor of bricks, or a thin layer of lean concrete shall be made so as to prevent contamination with clay, dust, vegetable and other foreign matter.

1.11.2 Stacks of fine and coarse aggregates shall be kept in separate stock piles sufficiently removed from each other to prevent the material at the edges of the piles from getting intermixed. On a large job, it is desirable to construct dividing walls to give each type of aggregates its own compartment. Fine aggregates shall be stacked in a place where loss due to the effect of wind is minimum.

1.11.3 Unless specified otherwise or necessitated by site conditions stacking of the aggregates should be carried out in regular stacks. The suggested sizes for stacks are as follows:

Sl. no.	Material	Size of Stack (in m)			
		Length		Breadth	Height
(i)	Soling stone	5.0		2.0	0.50
		Or	5.0	1.0	0.50
(ii)	Coarse aggregates	2.0		2.0	0.50
		Or	5.0	5.0	1.00
		Or	5.0	1.0	0.50
(iii)	Fine aggregates	2.0		2.0	0.50
		Or	5.0	5.0	1.00
		Or	5.0	1.0	0.50

1.12 FLY ASH

Fly ash shall be stored in such a manner as to permit easy access for proper inspection and identification of each consignment. Fly ash in bulk quantities shall be stored in stack similar to fine aggregates as specified in 1.11 to avoid any intrusion of foreign matter. Fly ash in bags shall be stored in stacks not more than 10 bags high.

1.13 STEEL

1.13.1 For each classification of steel, separate areas shall be earmarked. It is desirable that ends of bars and sections of each class be painted in distinct separate colours.

1.13.2 Steel reinforcement shall ordinarily be stored in such a way as to avoid distortion and to prevent deterioration and corrosion. It is desirable to coat reinforcement with cement wash before stacking to prevent scaling and rusting.

1.13.3 Bars of different classification, sizes and lengths shall be stored separately to facilitate issues in such

sizes and lengths so as to minimize wastage in cutting from standard lengths.

1.13.4 In case of long storage, reinforcement bars shall be stacked above ground level by at least 150 mm. Also in coastal areas or in case of long storage a coat of cement wash shall be given to prevent scaling and rusting.

1.13.5 Structural steel of different classification, sizes and lengths shall be stored separately. It shall be stored above ground level by at least 150 mm upon platforms, skids or any other suitable supports to avoid distortion of sections. In coastal areas or in case of long storage suitable protective coating of primer paint shall be given to prevent scaling and rusting.

1.14 ALUMINIUM SECTIONS

Aluminium sections of different classification, sizes and lengths shall be stored separately, on a level platform under cover. The aluminium sections shall not be pulled or pushed from the stack nor shall be slid over each other, to protect the anodizing layer.

1.15 DOORS, WINDOWS AND VENTILATORS

1.15.1 General

While unloading, shifting handling and stacking timber or other lignocellulosic material based, metal and plastic door and window frames and shutters, care shall be taken that the material is not dragged over the other as it may cause damage to the surface of the material particularly in the case of decorative shutters. The material should be lifted and carried preferably flat avoiding damage of corners or sides.

1.15.2 Metal and plastic doors, windows and ventilators shall be stacked upright (on their sills) on level ground preferably on wooden battens and shall not come in contact with dirt and ashes. If received in crates they shall be stacked according to manufacturer's instructions and removed from the crates as and when required for the work.

1.15.3 Metal and plastic frames of doors, windows and ventilators shall be stacked upside down with the kick plates at the top. These shall not be allowed to stand for long in this manner before being fixed so as to avoid the door frames getting out of shape and hinges being strained and shutters drooping.

1.15.4 During the period of storage all metal doors, windows and ventilators shall be protected from loose cement and mortar by suitable covering such as tarpauline. The tarpauline shall be hung loosely on temporary framing to permit circulation of air to prevent condensation.

1.15.5 All timber and other lignocellulosic material based frames and shutters shall be stored in a dry and clean covered space away from any infestation and dampness. The storage shall preferably be in well ventilated dry rooms. The frames shall be stacked one over the other in vertical stacks with cross battens at regular distances to keep the stack vertical and straight. These cross battens should be of uniform thickness and placed vertically one above the other. The door shutters shall be stacked in the form of clean vertical stacks over the other and at least 80 mm above ground on pallets or suitable beams or rafters. The top of the stack shall be covered by a protecting cover and weighted down by means of scantlings or other suitable weights. The shutter stack shall rest on hard and level ground.

1.15.6 If any timber or other lignocellulosic material based frame or shutter becomes wet during transit, it shall be kept separate from the undamaged material. The wet material may be dried by stacking in shade with battens in between adjacent boards with free access of dry air generally following the guidance laid down in IS 1141.

1.15.7 Separate stacks shall be built up for each size, each grade and each type of material. When materials of different sizes grades and types are to be stacked in one stack due to shortage of space, the bigger size shall be stacked in the lower portion of the stacks. Suitable pallets or separating battens shall be kept in between the two types of material.

1.16 ROOFING SHEETS

1.16.1 Roofing sheets shall be stored and handled in such a manner as not to damage them in any way.

1.16.2 Plain and corrugated asbestos cement sheets shall be stacked horizontally to a height of not more than one meter on a firm and level ground, with timber or other packing beneath them. If stacked in exposed position, they shall be protected from damage by the winds.

Asbestos cement sheets of same variety and size shall be stacked together. Damaged sheets shall not be stacked with sound materials. All damaged sheets shall be salvaged as early as possible.

1.16.3 Corrugated galvanized iron sheets and aluminium sheets shall be stacked horizontally to a height of not more than 0.5 m on a firm and level ground, with timber or other packing beneath them. To protect them from dust and rain water, these shall be covered with tarpaulin or polyethylene sheets.

1.16.4 Plastic sheets and glass reinforced plastic (GRP) sheets shall be stacked under a shed to a height of not more than 0.5 m on a firm and level ground with timber or other packing beneath them.

1.17 GYPSUM BOARDS, PLYWOOD, FIBREBOARD, PARTICLE BOARD, BLOCK BOARD, ETC.

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

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

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

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

1.18 GLASS SHEETS

1.18.1 It is important that all glass sheets whether stored in crates or not shall be kept dry. Suitable covered storage space shall be provided for the safe storage of the glass sheets. In removing glass sheets from crates, great care shall be taken to avoid damages. The glass sheets shall be lifted and stored on its long edges against a vertical wall or other support with the first sheet so placed that its bottom edge is 25 mm from the vertical support. The stacks shall be of not more than 25 panes and shall be supported at two points by fillets of wood at 300 mm from each end. The whole stack shall be as close and as upright as possible.

The glass sheets of different sizes, thickness and type shall be stacked separately. The distance between any two stacks shall be of the order of 400 mm.

1.19 CAST IRON, GALVANIZED IRON AND ASBESTOS CEMENT PIPES AND FITTINGS

1.19.1 The pipes shall be unloaded where they are required when the trenches are ready to receive them.

1.19.2 Storage shall be done on firm, level and clear ground and wedges shall be provided at the bottom layer to keep the stack stable.

1.19.3 The stack shall be in pyramid shape or the pipes length-wise and cross-wise in alternate layers. The pyramid stack is advisable in smaller diameter pipes for conserving space in storing them. The height of the stack shall not exceed 1.5 m.

1.19.4 Each stack shall contain only pipes of same class and size, with consignment or batch number marked on it with particulars of suppliers wherever possible.

1.19.5 Cast iron detachable joints and fittings shall be stacked under cover separately from the asbestos cement pipes and fittings.

1.19.6 Rubber rings shall be kept clean, away from grease, oil heat and light.

1.20 POLYETHYLENE PIPES

1.20.1 Natural polyethylene pipe should be stored under cover and protected from direct sunlight. However, black polyethylene pipes may be stored either under cover or in the open.

1.20.2 Coils may be stored either on edges or stacked flat one on top of the other, but in either case they should not be allowed to come into contact with hot water or steam pipes and should be kept away from hot surface.

1.20.3 Straight lengths should be stored on horizontal racks giving continuous support to prevent the pipe taking on a permanent set.

1.20.4 Storage of pipes in heated areas exceeding 27⁰ C should be avoided.

1.21 UNPLASTICIZED PVC PIPES

1.21.1 The pipe should be given adequate support at all times. Pipes should be stored on a reasonably flat surface free from stones and sharp projections so that the pipe is supported throughout its length. In storage, pipe racks should be avoided. Pipe should not be stacked in large piles, especially under warm temperature conditions as the bottom pipes may distort, thus giving rise to difficulty in jointing. Socket and spigot pipes should be stacked in layers with sockets placed at alternate ends of the stacks to avoid lopsided stacks.

1.21.1.1 It is recommended not to store pipe inside another pipe.

1.21.1.2 On no account should pipes be stored in a stressed or bent condition or near the sources of heat.

1.21.1.3 Pipes should not be stacked more than 1.5 m high. Pipes of different sizes and classes should be stacked separately.

1.21.2 The ends of pipe should be protected from abrasion particularly those specially prepared for jointing either spigot or socket solvent welded joints or shouldered for use with couplings.

1.21.3 In tropical conditions, pipes should be stored in shade. In very cold weather, the impact strength of PVC is reduced making it brittle and more care in handling shall be exercised in wintry condition.

1.21.3 If due to unsatisfactory storage or handling a pipe becomes kinked, the damaged portion should be cut out completely. Kinking is likely to occur only on very thin walled pipes.

1.22 BITUMEN, ROAD TAR, ASPHALT, ETC.

1.22.1 All types of bitumen, road tar, asphalt, etc, in drums or containers shall be stacked vertically on their bottoms in up to 3 tiers. Leaky drums shall be segregated. Empty drums shall be stored in pyramidal stacks neatly in rows.

1.23 WATER

1.23.1 Wherever water is to be stored for construction purposes this shall be done in proper storage tanks to prevent any organic impurities getting mixed up with it.

1.24 OIL PAINTS

1.24.1 All containers of paints, thinners and allied materials shall preferably be stored in a separate room on floors with sand cushions. The room shall be well-ventilated and free from excessive heat, sparks of flame and direct rays of sun. The containers of paint shall be kept covered or properly fitted with lid and shall not be kept open except while using. The containers of paints have expiry date marked by the manufacturers, which should be highlighted so as to facilitate use of paint within due period.

1.25 SANITARY APPLIANCES

1.25.1 All sanitary appliances shall be carefully stored under cover to prevent damage. When accepting and storing appliances, advance planning shall be made regarding the sequence of removal from the store to the assembly positions. Supporting brackets shall be so stored as to be readily accessible for use with the appliances.

1.26 OTHER MATERIALS

1.26.1 Small articles like nails, screws, nuts and bolts, door and window fittings, polishing stones, protective clothing, spare parts of machinery, linings, packing, water supply and sanitary fittings, electrical fittings, insulation board, etc, shall be kept in suitable and properly protected store rooms. Valuable small material such as, copper pipes and fittings shall be kept under lock and key.

1.26.2 Earth

1.26.2.1 In loose stacks such as cart loads, lorry loads, etc. – 20%

1.26.2.2 In fills consolidated by light mechanical machinery – 10%

1.0.1.1 In fills consolidated by heavy mechanical machinery but not under OMC (Optimum Moisture Content) – 5%

1.0.1.2 In fills consolidated by heavy mechanical machinery at OMC – Nil

1.0.1.3 Consolidated fills in confined situation such as under floors. etc. – Nil

1.0.2 Other Materials

1.0.2.1 Manure or sludge – 8%

1.0.2.2 Moorum, building rubbish Lime and sand – Nil

1.0.2.3 Stone metal, 40 mm nominal size and above – 7.5%

1.0.2.4 Coarse aggregate/ stone metal below 40 mm nominal size – Nil

1.0.2.5 Soling stone/ Boulder 100 mm and above – 15%

1.0.2.6 Excavated rocks – 50%

1.1 RATE

The rate for carriage of materials is inclusive of all the operations described above.

TABLE 1.1
Storage and Stacking Check List
(Clause 1.4.1)

Sl.	Material/ Component	Base			Stack				Type of Cover		
		Firm Level Ground	Hard Floor	Off Floor	Heaps	Tiers	flat	Vertical	Open	Openbut covered	Under shed
1.	Cement			√		√					√
2.	Stone and Aggregates										
(a)	Stones, aggregates, fly ash and cinder	√			√				√		
(b)	Veneering stones	√				√		√	√		
3.	Bricks and Blocks	√				√			√		
4.	Tiles										
(a)	Clay and concrete floor, wall & roof tiles	√				√	√		☺		
(b)	Ceramic tiles		√			√	√	√			√
5.	Steel	√					√		√		
6.	Aluminum Sections		√				√				√
7.	Door, windows and Ventilators		√					√			√
8.	Roofing Sheets										
(a)	AC	√				√	√		√		
(b)	GI and Aluminum Sheets	√				√	√			√	
(c)	Plastic Sheets		√			√	√				√
9.	Boards like Plywood, Particle Boards, Fibre Boards, Block boards and Gypsum Board		√			√	√				√
10.	Glass Sheets		√				√				√
11.	CI, GI and AC Pipes & fittings										
(a)	Pipes	√				√	√		√		
(b)	CI and GI fittings		√				√				√
(c)	AC Fittings		√				√		√		
12.	Polyethylene Pipes			√		√	√				√
13.	Unplasticized PVC Pipes	√				√	√		√		
14.	Bitumen, Road Tar, Asphalt, etc. in Drums	√				√			√		
15.	Oil Paints		√			√					√
16.	Sanitary Appliances			√			☺				√

2.0 EARTH WORK

2.0 DEFINITIONS

Deadmen or Tell Tales: Mounds of earth left undisturbed in pits dug out for borrowing earth

Burjis: Short pillars of brick/ stone having top surface finished with cement plaster for marking etc.

Formation or Profile: Final shape of the ground after excavation or filling up.

Foul condition: Filthy and unhygienic conditions where physical movements are hampered such as soil mixed with sewage or night soil.

Lead : All distances shall be measured over the shortest practical route and not necessarily the route actually taken. Route other than shortest practical route may be considered in cases of unavoidable circumstances and approved by Engineer-in-charge along with reasons in writing.

Carriage by manual labour shall be reckoned in units of 50 metres or part thereof.

Carriage by animal and mechanical transport shall be reckoned in one km. unit. Distances of 0.5 km. or more shall be taken as 1 km. and distance of less than 0.5 km. shall be ignored. However, when the total lead is less than 0.5 km., it will not be ignored but paid for separately in successive stages of 50 metres subject to the condition that the rate worked on this basis does not exceed the rate for initial lead of 1 km. by mechanical/animal transport.

Lift: The vertical distance for removal with reference to the ground level. The excavation up to 1.5 metres depth below the ground level and depositing the excavated materials upto 1.5 metres above the ground level are included in the rate of earth work. Lifts inherent in the lead due to ground slope shall not be paid for.

Safety rules: Safety rules as laid down by the statutory authority and *as provided in National Building Code (NBC) shall be followed.*

2.1 CLASSIFICATION OF SOILS

2.1.0 The earthwork shall be classified under the following categories and measured separately for each category:

- (a) **All kind of soils:** Generally any strata, such as sand, gravel, loam, clay, mud, black cotton moorum, shingle, river or nallah bed boulders, siding of roads, paths etc. and hard core, macadam surface of any description (water bound, grouted tarmac etc.), lime concrete mud concrete and their mixtures which for excavation yields to application of picks, showels, jumper, sacrifiers, ripper and other manual digging implements.
- (b) **Ordinary rock:** Generally any rock which can be excavated by splitting with crow bars or picks and does not require blasting, wedging or similar means for excavation such as lime stone, sand stone, hard laterite, hard conglomerate and un-reinforced cement concrete below ground level.

If required light blasting may be resorted to for loosening the materials but this will not in anyway entitle the material to be classified as 'Hard rock'.
- (c) **Hard rock:** Generally any rock or boulder for the excavation of which blasting is required such as quartzite, granite, basalt, reinforced cement concrete (reinforcement to be cut through but not separated from concrete) below ground level and the like.
- (d) **Hard rock (blasting prohibited):** Hard rock requiring blasting as described under (c) but where the blasting is prohibited for any reason and excavation has to be carried out by chiseling, wedging, use of rock hammers and cutters or any other agreed method.

2.2 PROTECTIONS

2.2.0 Excavation where directed by the Engineer-in- Charge shall be securely barricaded and provided with proper caution signs, conspicuously displayed during the day and properly illuminated with red lights *and/or written using fluorescent reflective paint as directed by engineer in charge* during the night to avoid accident.

2.2.1 The Contractor shall take adequate protective measures to see that the excavation operations do not damage the adjoining structures or dislocate the services. Water supply pipes, sluice valve chambers, sewerage pipes, manholes, drainage pipes and chambers, communication cables, power supply cables etc. met within the course of excavation shall be properly supported and adequately protected, so that these services remain functional. However, if any service is damaged during excavation shall be restored in reasonable time.

2.1.1 Excavation shall not be carried out below the foundation level of the adjacent buildings until underpinning, shoring etc. is done as per the directions of the Engineer-in-Charge for which payment shall be made separately.

2.1.2 Any damages done by the contractor to any existing work shall be made good by him at his own cost. Existing drains pipes, culverts, over head wires, water supply lines and similar services encountered during

the course of execution shall be protected against damage by the contractor. The contractor shall not store material or otherwise occupy any part of the site in manner likely to hinder the operations of such services.

2.2 SITE CLEARANCE

2.2.1 Before the earth work is started, the area coming under cutting and filling shall be cleared of shrubs, rank vegetation, grass, brushwood, trees and saplings of girth up to 30cm measured at a height of one metre above ground level and rubbish removed up to a distance of 50 metres outside the periphery of the area under clearance. The roots of trees and saplings shall be removed to a depth of 60cm below ground level or 30 cm below formation level or 15 cm below sub grade level, whichever is lower, and the holes or hollows filled up with the earth, rammed and leveled.

2.2.2 The trees of girth above 30 cm measured at a height of one metre above ground shall be cut only after permission of the Engineer-in-Charge is obtained in writing. The roots of trees shall also be removed as specified in 2.4.1. payment for cutting such trees and removing the roots shall be made separately.

2.2.3 Existing structures and services such as old buildings, culverts, fencing, water supply pipe lines, sewers, power cables, communication cables, drainage pipes etc. within or adjacent to the area if required to be diverted/removed, shall be diverted/dismantled as per directions of the Engineer-in- Charge and payment for such diversion/dismantling works shall be made separately.

2.2.4 In case of archaeological monuments within or adjacent to the area, the contractor shall provide necessary fencing around such monuments as per the directions of the Engineer-in -Charge and protect the same properly during execution of works. Payment for providing fencing shall be made separately.

2.2.5 Lead of 50 m mentioned in the 'Schedule Of Quantities' is the average lead for the disposal of excavated earth within the site of work. The actual lead for the disposal of earth may be more or less than the 50 m for which no cost adjustment shall be made in the rates.

2.2.6 Disposal of Earth shall be disposed off at the specified location or as decided by the Engineer- in-Charge. The contractor has to take written permission about place of disposal of earth before the earth is disposed off, from Engineer-in-Charge.

2.3 SETTING OUT AND MAKING PROFILES

2.3.1 A masonry pillar to serve as a bench mark will be erected at a suitable point in the area, which is visible from the largest area. This bench mark shall be constructed as per Fig. 2.1 and connected with the standard bench mark as approved by the Engineer-in-Charge. Necessary profiles with strings stretched on pegs, bamboos or 'Burjis' shall be made to indicate the correct formation levels before the work is started. The contractor shall supply labour and material for constructing bench mark, setting out and making profiles and connecting bench mark with the standard bench mark at his own cost. The pegs, bamboos or 'Burjis' and the bench mark shall be maintained by the contractor at his own cost during the excavation to check the profiles.

2.3.2 The ground levels shall be taken at 5 to 15 metres intervals (as directed by the Engineer-in- Charge) in uniformly sloping ground and at closer intervals where local mounds, pits or undulations are met with. The ground levels shall be recorded in field books and plotted on plans. The plans shall be drawn to a scale of 5 metres to one cm or any other suitable scale decided by the Engineer -in- Charge. North direction line and position of bench mark shall invariable be shown on the plans. These plans shall be signed by the contractor and the Engineer-in-Charge or their authorized representatives before the earth work is started. The labour required for taking levels shall be supplied by the contractor at his own cost.

2.0 EXCAVATION IN ALL KINDS OF SOILS

2.0.1 All excavation operations manually or by mechanical means shall include excavation and 'getting out' the excavated materials. In case of excavation for trenches, basements, water tanks etc. 'getting out' shall include throwing the excavated materials at a distance of at least one metre or half the depth of excavation, whichever is more, clear off the edge of excavation. In all other cases 'getting out' shall include depositing the excavated materials as specified. The subsequent disposal of the excavated material shall be either stated as a separate item or included with the items of excavation stating lead.

2.0.2 During the excavation the natural drainage of the area shall be maintained. Excavation shall be done from top to bottom. Undermining or undercutting shall not be done.

2.0.3 In firm soils, the sides of the trenches shall be kept vertical upto a depth of 2 metres from the bottom. For greater depths, the excavation profiles shall be widened by allowing steps of 50 cms on either side after every 2 metres from the bottom. Alternatively, the excavation can be done so as to give slope of 1:4 (1 horizontal : 4

vertical). Where the soil is soft, loose or slushy, the width of steps shall be suitably increased or sides sloped or the soil shored up as directed by the Engineer-in-Charge. It shall be the responsibility of the contractor to take complete instructions in writing from the Engineer-in-Charge regarding the stepping, sloping or shoring to be done for excavation deeper than 2 metres.

2.0.4 The excavation shall be done true to levels, slope, shape and pattern indicated by the Engineer-in-Charge. Only the excavation shown on the drawings with additional allowances for centering and shuttering or as required by the Engineer-in-Charge shall be measured and recorded for payment.

2.0.5 In case of excavation for foundation in trenches or over areas, the bed of excavation shall be to the correct level or slope and consolidated by watering and ramming. If the excavation for foundation is done to a depth greater than that shown in the drawings or as required by the Engineer-in-Charge, the excess depth shall be made good by the contractor at his own cost with the concrete of the mix used for levelling/bed concrete for foundations. Soft/defective spots at the bed of the foundations shall be dug out and filled with concrete (to be paid separately) as directed by the Engineer-in-Charge.

2.0.6 While carrying out the excavation for drain work care shall be taken to cut the side and bottom to the required shape, slope and gradient. The surface shall then be properly dressed. If the excavation is done to a depth greater than that shown on the drawing or as required by the Engineer-in-Charge, the excess depth shall be made good by the contractor at his own cost with stiff clay puddle at places where the drains are required to be pitched and with ordinary earth, properly watered and rammed, where the drains are not required to be pitched. In case the drain is required to be pitched, the backfilling with clay puddle, if required, shall be done simultaneously as the pitching work proceeds. The brick pitched storm water drains should be avoided as far as possible in filled-up areas and loose soils.

2.0.7 In all other cases where the excavation is taken deeper by the contractor, it shall be brought to the required level by the contractor at his own cost by filling in with earth duly watered, consolidated and rammed.

2.0.8 In case the excavation is done wider than that shown on the drawings or as required by the Engineer-in-Charge, additional filling wherever required on the account shall be done by the contractor at his own cost.

2.0.9 The excavation shall be done manually or by mechanical means as directed by Engineer-in-charge considering feasibility, urgency of work, availability of labour/mechanical equipments and other factors involved. Contractor shall ensure every safety measures for the workers. Neither any deduction will be made nor any extra payment will be made on this account.

2.1 EARTH WORK BY MECHANICAL MEANS

Earth work by mechanical means involves careful planning keeping in view site conditions i.e. type of soil, nature of excavation, distances through which excavated soil is to be transported and working space available for employing these machines. The earth moving equipment should be accordingly selected.

The earth moving equipment consists of excavating and transporting equipment. Excavating equipments may be further classified as excavators and tractor based equipments.

2.1.1 Excavators

Excavators generally used at site are as follows:

(i) **Dipper-shovel:** It is used for excavating against a face or bank consisting of open-top bucket or dipper with a bottom opening door, fixed to an arm or dipper stick which slides and pivots on the jib of the crane. It is suitable for excavating all clay chalk and friable materials and for handling rock and stone. However, it is not suitable for surface excavation for which a skimmer is used.

(ii) **Backhoe:** It is similar to face shovel except that the dipper stick pivots on the end of the jib and the dipper or bucket works towards the chassis and normally has no bottom door but is emptied by swinging away from the chassis to invert the bucket. It may be designed to carry both a front-mounted bucket loading mechanism and a rear mounted backhoe. It is mainly used to excavate trenches and occasionally used for the excavation of open areas such as small basements.

In the backhoe mode the bucket lifts, swings and discharges materials while the undercarriage is stationary. When used in the 'loader' mode, the machine loads or excavated through forward motion of the machine, and lifts, transports and discharges materials.

(iii) **Skimmer:** This arrangement is similar to the face shovel except that in this case the bucket slides on

rollers directly along the jib and thus has a more restricted movement. It is used for surface excavation and levelling in conjunction with transport to haul away the excavated material.

(iv) **Dragline:** It is usually fitted with a long slender boom or jib and the bucket, which in operation faces towards the machine and has no door, is supported by cable only as on a crane. It works from the side of the excavation at normal ground level and is used for excavating large open excavations such as basements when the depth is beyond the limit of the boom of a backhoe. It is commonly used for open cast mining operations.

(v) **Clamshell:** It consists of two hinged half-buckets or jaws pivoted to a frame which is suspended by cable from a long jib of an excavation. The grab is used for deep excavations of limited area on all types of soil except rock. Crane and Grab is a variant of this type of equipment.

2.1.2 Tractor-based Equipment

It is a self-propelled crawler or wheeled machine used to exert a push or pull force through mounted equipment. It is designed either as attachments to normal tracked or wheeled tractors or as machines in which the earth moving attachments and the tractor are designed as a single integrated unit. A tractor, which is hydraulically operated, can be rigged as :

(i) **Loaders:** It is used for loading, light dozing, scraping and grabbing operations, lifting and transporting the materials (loose earth, rubble, sand, gravel aggregate etc) at various sites through forward motion of the machine.

(ii) **Tractor Shovel:** This consists of a tipping bucket at the front attached by strong pivoted arms or booms to the frame of the machine. It is used for stripping top soil, excavating against a face, bulldozing and for loading spoil or loose materials. It is similar to crawler dipper-shovel.

(iii) **Trench Digger:** It operates on the same principle as a backhoe excavator except that the bucket is controlled by hydraulic rams instead of cables and pulleys.

(iv) **Scraper:** Scrapers provide unique capability to excavate, load, haul and dump materials. Scrapers are available in various capacities by a number of manufacturers with options such as self - loading with elevators, twin engines or push-pull capability. They are cost effective where the haul distance is too long for bulldozers, yet too short for trucks. This distance typically ranges from 120 m to 1200 m; however, the economics should be evaluated for each project.

Scraper has an open bowl with a cutting edge positioned between the axles, which cuts, loads, transports, discharges and spreads through forward motion of the machine. Loading through forward motion of the machine can be assisted by a powered mechanism (elevator) fixed to the scraper bowl.

(v) **Bulldozer and Angle-dozer:** The most common equipment used for clearing and levelling activities is a bulldozer. The terms bulldozer is used to define a tractor mounted with a dozing blade.

The bulldozer consists of a rectangular steel blade with renewable cutting edge set at right angles (capable of only tilting but not angling) to the direction of travel and attached by steel arms to the side frames of a crawler tractor. It may be used for excavating natural soil or for moving loose soil or debris, which is pushed forward as the tractor forces it ahead.

(vi) **Angledozer** is capable of both tilting and angling

2.1.3 Transporting Equipment

This implies horizontal movement primarily but it can involve some vertical movement too.

(i) **Dumpers:** These are self-propelled wheeled machines, having an open body. It is designed for the transport of excavated materials and consists of a shallow tipping hopper or skip mounted on a wheeled chassis, such as, power barrow, dumper, multi-skip dumpers, high discharge dumpers, dump truck, etc. These can be rear dump, side dump or bottom dump.

(ii) **Vibratory Roller:** It is a single Drum Vibratory Roller for compaction of embankments, etc. The smooth drum version is for compaction of granular and mixed soil. The sheep's foot Roller consists of a hollow cylindrical steel drum or drums on which projecting feet are mounted. These feet penetrate into the fill as a roller moves forward and cause compaction. The geometry of the foot may be sheep, club pyramid, cone or cylinder foot. Such rollers are employed for compaction (densification) of cohesive and semi-cohesive soils.

2.2 FILLING

2.2.1 The earth used for filling shall be free from all roots, grass, shrubs, rank vegetation, brushwood, tress, sapling and rubbish.

2.2.2 Filling with excavated earth shall be done in regular horizontal layers each not exceeding 20 cm in depth. All lumps and clods exceeding 8 cm in any direction shall be broken. Each layer shall be watered and consolidated with steel rammer or ½ tonne roller. Where specified, every third and top must layer shall also be consolidated with power roller of minimum 8 tonnes. Wherever depth of filling exceeds 1.5 metre vibratory power roller shall be used to consolidate the filing unless otherwise directed by Engineer-in-charge. The top and sides of filling shall be neatly dressed. The contractor shall make good all subsidence and shrinkage in earth fillings, embankments, traverses etc. during execution and till the completion of work unless otherwise specified.

2.3 MEASUREMENTS

2.3.1 The length and breadth of excavation or filling shall be measured with a steel tape correct to the nearest cm. The depth of cutting or height of filling shall be measured, correct to 5 mm, by recording levels before the start of the work and after the completion of the work. The cubical contents shall be worked out to the nearest two places of decimal in cubic metres.

In case of open footings up to the depth of 1.5 metres, around excavation of 30 cm. beyond the outer dimension of footing shall be measured for payment to make allowances for centering and shuttering. Any additional excavation beyond this limit shall be at the risk and cost of the contractor and shall not be measured for payment.

2.11.1.1 In case of open footings/Rafts at a depth of more than 1.5 metre, around excavation of 75 cm shall be measured for payment to make allowance for centering and shuttering. Additional excavation beyond this limit shall be at the risk and cost of the contractor and shall not be measured for payment.

2.3.3 In case the ground is fairly uniform and where the site is not required to be levelled, the Engineer-in-Charge may permit the measurements of depth of cutting or height of filling with steel tape, correct to the nearest cm. In case of borrow pits, diagonal ridges, cross ridges or dead-men, the position of which shall be fixed by the Engineer-in-Charge, shall be left by the contractor to permit accurate measurements being taken with steel tape on the completion of the work. Deduction of such ridges and dead men shall be made from the measurements unless the same are required to be removed later on and the earth so removed is utilized in the work. In the latter case nothing extra will be paid for their removal as subsequent operation.

2.3.4 Recording Measurements for Earth Levelling Work

(i) **Level Books:** In case of levelling operations and earthwork, measurements are required to be recorded in level books in addition to Measurement Books. The Level Books should be numbered, accounted for and handled like Measurement Books.

(ii) **Preparatory Works:** Before starting the earth work, following steps should be taken :

(a) Original ground levels should be recorded in the Level Book in the presence of the contractor or his authorized representative, and should be signed by him and the Department Officer who records the levels. All the local mounds and depressions should be indicated clearly in the drawing and the field Level Book and should be checked by the Assistant Engineer/Executive Engineer before the levelling work is started.

(b) A suitable baseline should be fixed with permanent masonry pillars at distances not exceeding 150 metres to provide a permanent reference line for facilitating check work. The base line (s) should be entered in the Level Book with co-ordinates. These baselines should be maintained till the final payment for the work has been made.

(c) While recording the levels, it should be ensured that the circuit is closed by taking final levels of the starting point or any other point, the R.L. of which was previously determined.

(d) Plans showing initial levels, location of bench marks and reduced levels, should be prepared and signed by both the parties and attached to the agreement before commencement of the work.

(e) While recording the levels, it should be ensured that the circuit is closed by taking final levels of the starting point or any other point, the R.L. of which was previously determined.

(f) Plans showing initial levels, location of bench marks and reduced levels, should be prepared and signed by both the parties and attached to the agreement before commencement of the work.

2.4 SAND FILLING IN PLINTH

2.4.1 Sand

Sand shall be clean and free from dust organic and foreign matter and its grading shall be within the limits of grading zone IV or V.

2.4.2 Filling

Sand filling shall be done in a manner similar to earth filling in plinth specified in 2.23.3.2. except that consolidation shall be done by flooding with water. The surface of the consolidated sand filling shall be dressed to the required level or slope and shall not be covered till the Engineer-in-Charge has inspected and approved the sand filling.

2.4.3 Measurements

The length, breadth and depth of consolidated sand shall be measured with steel tape correct to the nearest cm and cubical contents worked out in cubic metres correct to two places of decimal.

2.4.4 Rates

The rates include the cost of material and labour involved in all the operations described above.

2.5 SURFACE DRESSING.

2.5.1 Surface dressing shall include cutting and filling upto a depth of 15 cm and clearing of shrubs, rank vegetation, grass, brushwood, trees and saplings of girth upto 30 cm measured at a height of one metre above the ground level and removal of rubbish and other excavated material upto a distance of 50 metres outside the periphery of the area under surface dressing. High portions of the ground shall be cut down and hollows depression filled upto the required level with the excavated earth so as to give an even, neat and tidy look.

2.5.2 Measurements

Length and breadth of the dressed ground shall be measured correct to the nearest cm and the area worked out in square metres correct to two places of decimal.

2.26 JUNGLE CLEARANCE

2.26.0 Jungle clearance shall comprise uprooting of rank vegetation, grass, brushwood, shrubs, stumps, trees and saplings of girth upto 30 cm measured at a height of one metre above the ground level. Where only clearance of grass is involved it shall be measured and paid for separately.

2.26.1 Uprooting of Vegetations

The roots of trees and saplings shall be removed to a depth of 60 cm below ground level or 30 cm below formation level or 15 cm below sub-grade level, whichever is lower. All holes or hollows formed due to removal of roots shall be filled up with earth rammed and levelled. Trees, shrubs, poles, fences, signs, monuments, pipe lines, cable etc., within or adjacent to the area which are not required to be disturbed during jungle clearance shall be properly protected by the contractor at his own cost and nothing extra shall be payable.

2.26.2 Stacking and Disposal

All useful materials obtained from clearing and grubbing operation shall be stacked in the manner as directed by the Engineer -in-Charge. Trunks and branches of trees shall be cleared of limbs and tops and stacked neatly at places indicated by the Engineer-in- Charge. The materials shall be the property of the Government. All unserviceable materials which in the opinion of the Engineer-in-Charge cannot be used or auctioned shall be removed up to a distance of 50 m outside the periphery of the area under clearance. It shall be ensured by the contractor that unserviceable materials are disposed off in such a manner that there is no likelihood of getting mixed up with the materials meant for construction.

2.26.3 Clearance of Grass

Clearing and grubbing operation involving only the clearance of grass shall be measured and paid for separately and shall include removal of rubbish upto a distance of 50 m outside the periphery of the area under clearance.

2.26.4 Measurements

The length and breadth shall be measured correct to the nearest cm and area worked out in square metres correct to two places of decimal.

2.26.5 Rates

The rate includes cost of all the operation described above.

Care should be taken in the application of chemicals to see that they are not allowed to contaminate wells or springs which serve as source of drinking water.

2.28.0 Anti-Termite Treatment: Constructional Measures

The construction measures specified below should be adopted for protection against subterranean termites originating both internally from within the plinth and externally from the area surrounding the building.

(i) Earth free from roots, dead leaves, or other organic matter shall be placed and compacted in successive horizontal layers of loose material not more than 200 mm thick. Dry brick shall be inserted at last 50 mm in brick masonry for providing apron floor around the periphery.

(ii) Brick on edge masonry in cement mortar shall be laid on the plinth wall. Dry brick shall be placed on the inner side of plinth wall for getting anticipated offset space for coarse sand and on the other side for installing anti-termite masonry groove. In the case of intermediate walls, dry bricks are placed on either side of the brick on edge masonry for getting offset space for coarse sand layer.

(iii) The dry brick for the anti-termite groove shall be taken out and dense cement concrete 1:3:6 (1 cement : 3 sand : 6 coarse aggregate by volume) sub-floor carpet shall be laid casting the anti-termite groove in position. In case of internal partition walls, the cement concrete sub-floor shall be laid on either side over the dry bricks to sufficient extent for getting staggered vertical joint over the joint of plinth wall and earth filling.

(iv) Superstructure masonry shall be raised over the dense cement concrete sub floor carpet and over-head jobs completed.

(v) The dry brick for coarse sand layer shall be removed and graded sand (of size 3 to 5 mm) layer at least 100 mm thick shall be compacted over the earth filling and underneath the partially laid dense cement concrete sub-floor carpet.

(vi) Dense cement concrete (1:3:6 mix.) sub-floor at least 75 mm thick shall be laid over the sand filling. Necessary finish may be provided to the cement concrete sub-floor carpet. [See Fig. 2.3](vi)]

(vii) Dry brick provided for apron floor shall be taken out and 600 mm wide formation of earth in 1:30 slope shall be made. Over the formation, 75 mm thick lime concrete 1:3:6 (1 lime:3 sand: 6 coarse aggregate, by volume) shall be laid. [See Fig. 2.3](vii)]

(viii) Over the 75 mm thick like concrete bed at least 25 mm thick cement concrete topping 1:2:4 (1 cement: 2 sand: 4 fine aggregate, by volume) shall be laid and 12 mm thick cement plaster shall be applied on foundation and plinth. [See Fig. 2.3](viii)]

The final recommendations incorporating the constructional details given above (i to viii) are shown in Fig. 2.4.

2.28.1 Anti Termite Treatment : Treatment for Existing Building: Post Construction Treatment

2.28.4.1 Material

(i) *Chemicals:* Any one of the following chemicals conforming to relevant Indian Standards in water emulsion may be used for soil treatment in order to protect a building from termite attack.

Chemical with Percent	Relevant Indian Standards (Active ingredient)	Concentration by weight
Chlorpyrifos 20EC	IS 8944	1.0
Lindane 20EC	IS 632	1.0

These chemicals are available in concentrated form in the market and concentration is indicated on the sealed containers. To achieve the specified percentage of concentration, chemicals should be diluted with water in required quantity before it is used. Graduated containers shall be used for dilution of chemicals with water in the required proportion to achieve the desired percentage of concentration. For example, to dilute chemical of 20% concentration, 19 parts of water shall be added to one part of chemical for achieving 1% concentration. Oil or kerosene based solution of chlorpyrifos 20 EC or Lindane 20 EC, 1.0 percent (by weight) concentration is useful for treatment of wood. Engineer-in-charge shall procure the chemical of required concentration in sealed original containers directly from the reputed and authorized representative. Chemical shall be kept in the custody of the Engineer-in-charge or his authorized representatives and issued for use to meet the day's requirements. Empty containers after washing and concentrated chemical left unused at the end of the day's work shall be returned to the Engineer-in-charge or his authorized representative.

(ii) *Measurements:* Concentrated chemical in sealed containers shall be measured in litres. Chemicals of

different types and concentration shall be measured separately.

(iii) *Rate:* The rate for the concentrated chemical shall include the cost of material, containers and all the operations involved in transportation and delivery at the place specified.

(iv) *Safety Precautions:* Chemical used for antitermite treatment are insecticides with a persistent action and are highly poisonous. This chemical can have an adverse effect upon health when absorbed through the skin, inhaled as vapours or spray mists or swallowed.

The containers having emulsifiable concentrates shall be clearly labeled and kept securely closed in stores so that children or pet cannot get at them. Storage and mixing of concentrates shall not be done near any fire source or flame. Persons carrying out chemical soil treatments should familiarize themselves and exercise due care when handling the chemicals whether in concentrated or in diluted form. After handling the concentrates or dilute emulsion, worker shall wash themselves with soap and water and wear clean clothing especially before eating and smoking. In the event of severe contamination, clothing shall be removed at once and the skin washed with soap and water. If chemical has splashed into the eyes, they shall be flushed with plenty of soap and water and immediate medical attention shall be sought.

The use of chemical shall be avoided where there is any risk of wells or other water supplies becoming contaminated.

2.28.4.2 Treatment

(i) Once the termites have an ingress into the building, they keep on multiplying and destroy the wooden and cellulosic materials, and as such it becomes essential to take measures for protection against termites. Anti termite measures described below are necessary for the eradication and control of termites in existing building. To facilitate proper penetrations of chemical in to the surface to be treated, hand operated pressure pump shall be used. To have proper check for uniform penetration of chemical, graduated containers shall be used. Proper check should be kept so that the specified quantity of chemical is used for the required area during the operation. Chemical treatment for the eradication and control of sub-terrestrial termites in existing building shall be done as per IS 6313 (Part III). Treatment shall be got done only from the approved specialized agencies using the chemical procured directly by the Engineer-in-Charge from reputed and authorized dealers.

(ii) ***Treatment along outside of foundations:*** The soil in contact with the external wall of the building shall be treated with chemical emulsion at the rate of 7.5 litres per square metre of vertical surface of the sub-structure to a depth of 300 mm. To facilitate this treatment, a shallow channel shall be excavated along and close to the wall face. The chemical emulsion shall be directed towards the wall at 1.75 litres per running metre of the channel. Rodding with 12 mm diameter mild steel rods at 150 mm apart shall be done in the channel. If necessary, for uniform dispersal of the chemical to 300 mm depth from the ground level. The balance chemical of 0.5 litre per running metre shall then be used to treat the backfill earth as it is returned to the channel directing the spray towards the wall surface.

If there is a concrete or masonry apron around the building, approximately 12 mm diameter holes shall be drilled as close as possible to the plinth wall about 300 mm apart, deep enough to reach the soil below and the chemical emulsion pumped into these holes to soak the soil below at the rate of 2.25 litres per linear metre.

In soils which do not allow percolation of chemicals to desired depth, the uniform disposal of the chemical to a depth of 300 mm shall be obtained by suitably modifying the mode of treatment depending on site condition.

In case of RCC foundations the soil (backfill) in contact with the column sides and plinth beams along with external perimeter of the building shall be treated with chemical emulsion at the rate of 7.5 litres/sqm. of the vertical surface of the structure. To facilitate this treatment, trenches shall be excavated equal to the width of the shovel exposing the sides of the column and plinth beams upto a depth of 300 mm or upto the bottom of the plinth beams, if this level is less than 300 mm. The chemical emulsion shall be sprayed on the backfill earth as it is returned into the trench directing the spray against the concrete surface of the beam or column as the case may be.

(iii) ***Treatment of Soil under Floors :*** The points where the termites are likely to seek entry through the floor are the cracks at the following locations:

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

- b) On the floor surface owing to construction defects;
- c) At construction joints in a concrete floor, cracks in sections; and
- d) Expansion joints in the floor.

Chemical treatment shall be provided in the plinth area of ground floor of the structure, wherever such cracks are noticed by drilling 12 mm holes at the junction of floor and walls along the cracks on the floor and along the construction and expansion joints at the interval of 300 mm to reach the soil below. Chemical emulsion shall be squirted into these holes using a hand operated pressure pump to soak the soil below until refusal or upto a maximum of one litre per hole. The holes shall then be sealed properly with cement mortar 1:2 (1 cement: 2 coarse sand) finished to match the existing floors. The cement mortar applied shall be cured for at least 10 days as per instruction of Engineer-in-charge.

(iv) **Treatment of Voids in Masonry:** The movement of termites through the masonry wall may be arrested by drilling holes in masonry wall at plinth level and squirting chemical emulsions into the holes to soak the masonry. The holes shall be drilled at an angle of 45 degree from both sides of the plinth wall at 300 mm intervals and emulsion squirted through these holes to soak the masonry using a hand operated pump. This treatment shall also be extended to internal walls having foundations in the soil. Holes shall also be drilled at wall corners and where door and window frames are embedded in the masonry or floor at ground. Emulsion shall be squirted through the holes till refusal or to a maximum of one litre per hole. Care shall be taken to seal the holes after the treatment.

(v) **Treatment at Points of Contact of Wood Work :** The wood work which has already been damaged beyond repairs by termites shall be replaced. The new timber shall be dipped or liberally brushed at least twice with chemical in oil or kerosene. All existing wood work in the building which is in contact with the floor or walls and which is infested by termites, shall be treated by spraying at the points of contacts with the adjoining masonry with the chemical emulsion by drilling 6 mm holes at a downward angle of about 45 degree at junction of wood work and masonry and squirting chemical emulsion into these holes till refusal or to a maximum of half a litre per hole. The treated holes shall then be sealed.

Infested wood work in chawkhats, shelves, joints, purlins etc., in contact with the floor or the walls shall be provided with protective treatment by drilling holes of about 3 mm diameter with a downward slant to the core of the wood work on the inconspicuous surface of the frame. These holes should be at least 150 mm centre to centre and should cover in entire frame work. Chemicals shall be liberally infused in these holes. If the wood is not protected by paint or varnish two coats of the chemicals shall be given on all the surfaces and crevices adjoining the masonry.

2.28.4.3 Measurements: All dimensions shall be measured correct to a cm. The measurements shall be made of the surface actually provided with anti termite treatment. Measurements shall be done separately for treatment of foundations, soils under floors, voids in masonry and wood work as detailed below:

(i) *Treatment along outside of foundations:* The measurements shall be made in running metres taking length along the plinth of the building.

(ii) *Treatment of soil under floors:* The measurements shall be made in square metres, inside clear dimensions of rooms, verandah etc. shall be taken.

(iii) *Treatment of voids in masonry:* The measurements shall be made in running metres along the plinth of the building.

(iv) *Treatment of wood work:* The measurements shall be made in running metres for chawkhats, joints, purlins, beams etc.

3.0 MORTARS

3.0 GENERAL

Desirable properties of mortars for use in masonry are:

- (a) Workability
- (b) Water retentivity
- (c) Rate of stiffing
- (d) Strength

- (e) Resistance to rain penetration
- (f) Durability

3.1 MATERIALS

3.1.1 Water

3.1.1.1 Water used for mixing and curing shall be clean and free from injurious quantities of alkalies, acids, oils, salts, sugar, organic materials, vegetable growth or other substance that may be deleterious to bricks, stone, concrete or steel. Potable water is generally considered satisfactory for mixing. The Ph value of water shall be not less than 6.

The physical and chemical properties of ground water shall be tested along with soil investigation and if the water is not found conforming to the requirements of IS 456-2000, the tender documents shall clearly specify that the contractor has to arrange good quality water for construction indicating the source.

3.1.1.2 Water found satisfactory for mixing is also suitable for curing. However, water used for curing shall not produce any objectionable stain or unsightly deposit on the surface.

3.1.1.3 Sea water shall not be used for mixing or curing

3.1.1.4 Water from each source shall be tested before the commencement of the work and thereafter once in every three months till the completion of the work. In case of ground water, testing shall also be done for different points of drawdown. Water from each source shall be got tested during the dry season before monsoon and again after monsoon.

3.1.2 Cement

3.1.2.1 The cement used shall be any of the following grade and the type selected should be appropriate for the intended use.

- (a) 33 grade ordinary Portland cement conforming to IS 269-2013.
- (b) 43 grade ordinary Portland cement conforming to IS 8112-2013.
- (c) 53 grade ordinary Portland cement conforming to IS 12269-2013.
- (d) Rapid hardening Portland cement conforming to IS 8041-1990, **Reaffirm Apr 2014**
- (e) Portland slag cement conforming to IS 455-1989, **Reaffirm Apr 2014**.
- (f) Portland Pozzolana cement (flyash based) conforming to IS 1489 (Part 1)-1991, **Reaffirm Apr 2014**.
- (g) Portland Pozzolana cement (calcined clay based) conforming to IS 1489 (part 2)-1991, **Reaffirm Apr 2014**.
- (h) Hydrophobic **Portland** cement conforming to IS 8043-1991, **Reaffirm Apr 2014**.
- (i) Low heat Portland cement conforming to IS 12600-1989, **Reaffirm Apr 2014**.
- (j) Sulphate resisting Portland cement conforming to IS 12330-1988, **Reaffirm Apr 2014**.
- (k) White cement conforming to IS 8042-1989, **Reaffirm Apr 2014**.

Different types of cement shall not be mixed together. In case more than one type of cement is used in any work, a record shall be kept showing the location and the types of cement used.

3.1.2.2 Caution in Use of Cement Grade 53 in Construction: Because of the faster hydration process, the concrete releases heat of hydration at a much faster rate initially and release of heat is the higher in case of Grade. 53. The heat of hydration being higher, the chances of micro-cracking of concrete is much greater. Thus, during initial setting period of concrete, the higher heat of hydration can lead to damaging micro-cracking within the concrete which may not be visible at surface. This cracking is different from shrinkage cracks which occurs due to faster drying of concrete in windy conditions.

The situation can be worse when we tend to increase the quantity of the cement in the concrete with a belief that such increases are better for both strength and durability of concrete. Thus, it is very essential to be forewarned that higher grade cement specially grade 53 should be used only where such use is warranted for making higher strength concrete and also where good Quality Assurance measures are in place, by which proper precaution are taken to relieve the higher heat of hydration through chilling of aggregates or by proper curing of concrete. There are instances where higher grade cement is being used even for low strength concrete, as, mortar or even for plastering. This can lead to unnecessary cracking of concrete/ surfaces.

Another issue to be cautioned against is the tendency of the manufacturers to project Grade 53 cement as stronger cement, whereas Grade 33 or 43 are enough to produce the concrete of desired characteristic strength.

The scenario of method of production of cement by various manufacturers should also be kept in mind while ordering various grades of cement. The ability to produce cements of particular fineness get fixed by the machinery installed by the manufacturers, and thus the ability to produce other various grades of cement by a particular manufacturer also gets limited. Whereas tendency today is to supply the consumer what he orders for by the manufacturers by simply stamping such grades on the bags. Thus, it is often observed that cement bags marked as grade 33 or 43 may really be containing cements of much higher grade.

3.1.2.3 Compressive Strength : Compressive strength requirement of each type of cement for various grades when tested in accordance with IS 4031 (part 6) shall be as under:

Sample	Strength in N/mm ² not less than for		
	Gr.33	Gr.43	Gr.53
Age at testing			
72 + 1 hr	16	23	27
168 + 2 hrs	22	33	37
672 + 4 hrs	33	43	53

3.1.2.4 Setting Time: Setting time of cement of any type of any grade when tested by Vicat apparatus method described in IS 4031 **(Part-5)-1988 (Reaffirm-2014)** shall conform to the following requirement:

- (a) Initial setting time: Not less than 30 minutes
- (b) Final setting time: Not more than 600 minutes

3.1.2.5 Supply: The cement shall be packed in jute sacking bags conforming to IS 2580, double hessian bituminized (CRI type) or woven HDPE conforming to IS 11652. Woven polypropylene conforming to IS 11653, jute synthetic union conforming to IS: 12174, or any other approved composite bags, bearing the manufacturer's name or his registered trade mark if any, with grade batch no. and type of cement, with date of manufacturing of batch of cement.

Every delivery of cement shall be accompanied by a producer's certificate conforming that the supplied cement conforms to relevant specifications. These certificates shall be endorsed to the Engineer-in-Charge for his record.

Every consignment of cement must have identification marks on packages indicating date of manufacturing grade and type of cement batch no. etc. **Cement** brought to works shall not be more than 6 weeks old from the date of manufacture.

Effective precautionary measures shall be taken to eliminate dust- nuisance during loading or transferring cement.

3.1.2.6 Stacking and Storage : Cement in bags shall be stored and stacked in a shed which is dry, leakproof and as moisture-proof as possible. Flooring of the shed shall consist of the two layers of dry bricks laid on well consolidated earth to avoid contact of cement bags with the floor. Stacking shall be done about 150 to 200 mm clear above the floor using wooden planks. Cement bags shall be stacked at least 450 mm clear off the walls and in rows of two bags leaving in a space of at least 600 mm between two consecutive rows. In each row the cement bags shall be kept close together so as to reduce air circulation. Stacking shall not be more than 10 bags high to avoid lumping under pressure. In stacks more than 8 bags high, the cement bags shall be arranged in header and stretcher fashion i.e. alternately lengthwise and crosswise so as to tie the stacks together and minimise the danger of toppling over.

Different types of cement shall be stacked and stored separately. Cement bags shall be stacked in a manner to facilitate their removal and use in the order in which they are received.

For extra safety during monsoon, or when cement is expected to be stored for an unusually long period, each stack shall be completely enclosed by a water proofing membrane, such as polyethylene, which shall cover the top of the stack. Care shall be taken to see that the water proofing membrane is not damaged at any time during use.

Storage of cement at the work site shall be at the contractor's expense and risk. Any damage occurring to cement due to faulty storage in contractor's shed or on account of negligence on his part shall be the liability of the contractor.

3.1.3 Fine Aggregate

3.1.3.1 Aggregate most of which passes through 4.75 mm IS sieve is known as fine aggregate. Fine aggregate shall consist of natural sand, crushed stone sand, crushed gravel sand stone dust or marble dust,

fly ash and broken brick (Burnt clay) . It shall be hard, durable, chemically inert, clean and free from adherent coatings, organic matter etc. and shall not contain any appreciable amount of clay balls or pellets and harmful impurities e.g. iron pyrites, alkalis, salts, coal, mica, shale or similar laminated materials in such form or in such quantities as to cause corrosion of metal or affect adversely the hardening, the strength, the durability or the appearance of mortar, plaster or concrete. The sum of the percentages of all deleterious material shall not exceed 5%. Fine aggregate must be checked for organic impurities such as decayed vegetation humps, coal dust etc. in accordance with the procedure prescribed in Appendix 'A' of Chapter 3.

3.1.3.2 Silt Content: The maximum quantity of silt in sand as determined by the method prescribed in Appendix 'C' of Chapter 3 shall not exceed 8%.

Fine aggregate containing more than allowable percentage of silt shall be washed as many times as directed by Engineer-in-charge so as to bring the silt content within allowable limits for which nothing extra shall be paid.

3.1.3.3 Grading: On the basis of particle size, fine aggregate is graded in to four zones. The grading when determined in accordance with the procedure prescribed in Appendix 'B' of Chapter 3 shall be within the limits given in Table 3.1 below. Where the grading falls outside the limits of any particular grading zone of sieves, other than 600 micron IS sieve, by a total amount not exceeding 5 per cent, it shall be regarded as falling within that grading zone.

TABLE 3.1
Fine Aggregates
(Clause 3.1.3)

IS Sieve	Percentage passing for			
	Grading Zone I	Grading Zone II	Grading Zone III	Grading Zone IV
10 mm	100	100	100	100
4.75 mm	90-100	90-100	90-100	95-100
2.36 mm	60-95	75-100	85-100	95-100
1.18 mm	30-70	55-90	75-100	90-100
600 microns	15-34	35-59	60-79	80-100
300 microns	5-20	8-30	12-40	15-50
150 microns	0-10	0-10	0-10	0-15

Deleterious Material: Sand shall not contain any harmful impurities such as iron, pyrites, alkalis, salts, coal or other organic impurities, mica, shale or similar laminated materials, soft fragments, sea shale in such form or in such quantities as to affect adversely the hardening, strength or durability of the mortar.

3.2.0 Grade of Masonry Mortar

The grade of masonry mortar will be defined by its compressive strength in N/mm^2 days as determined by the standard procedure detailed in IS 2250.

3.2.0.1 For proportioning the ingredients by volume, the conversion of weight into volume shall be made on the following basis:

(a) Burnt Clay Pozzolana	860 Kg/cum
(b) Coarse Sand (dry)	1280 kg/cum
(c) Fine sand (dry)	1600 kg/ cum
(d) Fly Ash	590 kg/ cum

(a) be avoided. **Aggregates from other than natural resources shall comply with requirements of IS383.**

(b) *Gravel:* It shall consist of naturally occurring (uncrushed, crushed or broken) river bed shingle or pit gravel. It shall be sound, hard and clean. It shall be free from flat particles of shale or similar laminated material, powdered clay, silt, loam, adherent coating, alkali, vegetable matter and other deleterious substances. Pit gravel shall be washed if it contains soil materials adhering to it. These shall conform to IS 383 unless otherwise specified.

(c) *Brick Aggregate:* Brick aggregate shall be obtained by breaking well burnt or overburnt dense brick/ brick bats. They shall be homogeneous in texture, roughly cubical in shape and clean. They shall be free from unburnt clay particles. Soluble salt, silt, adherent coating of soil, vegetable matter and other deleterious substances. Such aggregate should not contain more than one percent of sulphates and should not absorb more than 10% of their own mass of water, when used in cement concrete. It shall conform to IS 306 unless otherwise specified.

(d) Light weight aggregate such as sintered fly ash aggregate may also be used provided the Engineer-in-Charge is satisfied with the data on the proportion of concrete made with them.

4.1.1.2 Deleterious Material: Coarse aggregate shall not contain any deleterious material, such as pyrites, coal, lignite, mica, shale or similar laminated material, clay, alkali, soft fragments, sea shells and organic impurities in such quantity as to affect the strength or durability of the concrete. Coarse aggregate to be used for reinforced cement concrete. Coarse aggregate to be used for reinforced cement concrete shall not contain any material liable to attack the steel reinforcement. Aggregates which are chemically reactive with alkalis of cement shall not be used. The maximum quantity of deleterious material shall not be more than five percent of the weight of coarse aggregate when determined in accordance with IS 2386.

4.1.1.3 Size and Grading

(i) *Stone aggregate and gravel:* It shall be either graded or single sized as specified. Nominal size and grading shall be as under:-

(a) Nominal sizes of graded stone aggregate or gravel shall be 40, 20, 16, or 12.5 mm as specified

4.1.1.6 Testing: Coarse aggregate shall be tested for the followings (as per IS 2386)

- (a) Determination of particle size and shape (Appendix 'A' of Chapter 4)
- (b) Estimation of organic impurities (as per IS 2386 - Part II)
- (c) Surface moisture (Appendix 'B' of Chapter 4)
- (d) Determination of 10% fine value (Appendix 'C' of Chapter 4)

4.1.2 Chemical Admixtures

When required, admixtures of approved quality shall be mixed with concrete, as specified. The admixtures shall conform to IS 9103 and as specified in Chapter 5 - R.C.C.

4.1.2.1 Admixtures may be any one of the following classes for use in concrete:-

- (a) Water Reducing Admixtures
- (b) Retarding Admixtures
- (c) Accelerating Admixtures.
- (d) Water Reducing and Retarding Admixtures.
- (e) Water Reducing and Accelerating Admixtures.
- (f) Permeability Reducing (water proofing) Admixtures.

4.1.2.2 Liquid Admixtures: Admixtures introduced into the concrete as liquids generally fall into the following categories.

- (a) Air Entraining.
- (b) Water Reducing.
- (c) Water Reducing Retarders.
- (d) Retarders.
- (e) Water Reducing Accelerators.
- (f) Accelerators.

4.1.2.3 Dosage of these admixtures may vary according to manufacturers specification.

4.2. CEMENT CONCRETE

4.2.1 Grades of Cement Concrete: The concrete shall be in grade designated as under:

4.2.1.1 Two or more admixtures may not be compatible in the same solution. It is therefore mandatory that when two admixtures manufactured by the same manufacturers is being used simultaneously, the manufacturer shall certify their compatibility. In case the two or more admixtures are produced by different manufacturers, then, before their use in concrete, test shall be performed by the manufacturer to establish their compatibility, all such test reports shall be furnished to the Engineer-in-Charge for his approval before their use in concrete.

4.2.1.2 Some admixture may be in the form of powder, particle or high concentration liquids which may require mixing with water prior to dosing. Under these conditions water in solution shall be considered as part of total water content in the batch in order to maintain the water-cement ratio.

4.2.1.3 Admixture manufacturer's recommendation shall be carefully followed so as to ensure complete solution of the product or to prepare a standard solution of uniform strength for easier use.

4.2.1.4 Certain admixtures may contain significant amounts of finely divided insoluble materials or active

ingredients which may or may not be readily soluble. It is essential for such admixtures that precautions be taken to ensure that these constituents be kept in a state of uniform suspension before actual batching. When relatively small amounts of powered admixtures are to be used directly, these shall be pre-blended with cement.

4.2.1.5 Admixtures are sold under various trade names and may be in the form of liquids or powders. The proprietary name and the net quantity of content shall be clearly indicated in each package or container of admixtures. The admixtures shall be uniform within each batch and uniform between all batches.

4.2.1.6 No admixtures shall be accepted for use in concrete unless these are tested in accordance with IS 9103 and the test results are approved by the Engineer-in-Charge.

4.2.1.7 The characteristic strength is defined as the strength of material below which not more than 5 percent of the test results are expected to fall.

4.2.2 Workability of Concrete

4.2.2.1 The concrete mix proportion chosen should be such that the concrete is of adequate workability for the placing conditions of the concrete and can properly be compacted with the means available. Suggested ranges of workability of concrete measured in accordance with IS 1199 are given below:

Placing Conditions (1)	Degree of Workability (2)	Slump (mm) (3)
Blinding concrete: shallow sections: Pavements using pavers	Very low	See 4.2.2.2
Mass concrete: Lightly reinforced sections in slabs, beams, wall, columns, : floors	Low	25-75
Hand placed pavements: canallining; Strip footing	Medium	50-100
Heavily reinforced sections in slabs, beams, walls, columns:		
Slip form work: Pumped concrete	Medium	75-100
Trench fill	High	100-150
Tremie concrete	Very High	See 4.2.2.3

Note: For most of the placing conditions, internal vibrators (needle vibrators) are suitable. The diameter of the needle shall be determined based on the density and spacing of reinforcement bars and thickness of sections. For tremie concrete, vibrators are not required to be used.

4.2.2.2 In the 'very low' category of workability where strict control is necessary, for example, pavement quality concrete, measurement of workability by determination of compacting factor will be more appropriate than slump (see IS 1199) and a value of compacting factor of 0.75 to 0.80 is suggested.

4.2.2.3 In the 'very high' category of workability, measurement of workability by determination of flow will be appropriate (see IS 9103).

4.2.3 Concrete Mix Proportioning

4.2.3.1 The determination of the proportion of cement, aggregate and water to attain the required strength shall be made as follows:

(a) *By designing the concrete mix:* such concrete shall be called 'Design mix concrete', for details reference may be made to RCC Chapter.

(b) *By adopting nominal concrete mix:* such concrete shall be called 'Nominal mix concrete'.

Design mix concrete is preferred to nominal mix. If design mix concrete cannot be used for any reason on the work for grades of M20 or lower, nominal mixes may be used with the permission of Engineer-in-Charge, which, however, is likely to involve a higher cement content.

4.2.3.2 Nominal Mix Concrete: Nominal Mix Concrete may be used for concrete of M20 or lower. The proportions of materials for nominal mix concrete shall be in accordance with Table 4.7.

The cement content of the mix specified in Table 4.7 for any nominal mix shall be proportionately increased if the quantity of water in the mix has to be increased to overcome the difficulty or placement and compaction, so that the water cement ratio as specified is not exceeded.

TABLE 4.7
Proportions for Nominal Mix Concrete
(Clause 4.2.3.2)

Grade of Concrete	Total Quantity of Dry Aggregates by Mass per 50 kg of cement, to be taken	Proportion of Fine Aggregate to Coarse Aggregate (by Mass)	Quantity of Water per 50 kg of Cement, max Ltr.
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	<i>as the Sum of the Individual Masses of Fine and Coarse Aggregates, Kg.Max</i>		
(1)	(2)	(3)	(4)
M5	800	Generally 1:2 but subject to an upper limit of 1: 1 ½ and a lower limit of 1:2 ½	60
M7.5	625		45
M10	480		34
M15	330		32
M20	250		30

Note: (1) The proportion of the fine to coarse aggregate should be adjusted from upper limit progressively as the grading of fine aggregate becomes finer and the maximum size of coarse aggregate becomes larger. Graded coarse aggregate shall be used.

(2) Quantity of water required from durability point of view may be less than the value given above.

4.2.3.3 Machine Mixing: The mixer drum shall be flushed clean with water. Measured quantity of coarse aggregate shall be placed first in the hopper. This shall be followed with measured quantity of fine aggregate and then cement. In case fine aggregate is damp, half the required quantity of coarse aggregate shall be placed in the hopper, followed by fine aggregate and cement. Finally the balance quantity of coarse aggregate shall be fed in the hopper, & then the dry materials are slipped into the drum by raising the hopper. The dry material shall be mixed for atleast four turns of the drum. While the drum is rotating, water shall be added gradually to achieve the water cement ratio as specified or as required by the Engineer- in-Charge. After adding water, the mixing shall be continued until concrete of uniform colour, uniformly distributed material and consistency is obtained. Mixing shall be done for atleast two minutes after adding water. If there is segregation after unloading from the mixer, the concrete should be remixed.

The drum shall be emptied before recharging. When the mixer is closed down for the day or at any time exceeding 20 minutes, the drum shall be flushed cleaned with water.

4.2.6 Placing: The concrete shall be deposited as nearly as practicable in its final position to avoid rehandling. It shall be laid gently (not thrown) and shall be thoroughly vibrated and compacted before setting commences and should not be subsequently disturbed. Method of placing shall be such as to preclude segregation. Care shall be taken to avoid displacement of reinforcement or movement of form work and damage due to rains. As a general guidance, the maximum free fall of concrete may be taken as 1.5 metre.

4.2.7 Compaction: Concrete shall be thoroughly compacted and fully worked around embedded fixtures and into corners of the form work. Compaction shall be done by mechanical vibrator of appropriate type till a dense concrete is obtained. The mechanical vibrators shall conform to IS 2505, IS 2506, IS 2514 and IS 4656. To prevent segregation, over vibration shall be avoided.

Compaction shall be completed before the initial setting starts. For the items where mechanical vibrators are not to be used, the contractor shall take permission of the Engineer-in- Charge in writing before the start of the work. After compaction the top surface shall be finished even and smooth with wooden trowel before the concrete begins to set.

4.2.8 Construction Joints: Concreting shall be carried out continuously upto construction joints. The position and arrangement of construction joints shall be as shown in the structural drawings or as directed by the Engineer-in- Charge. Number of such joints shall be kept minimum. Joints shall be kept as straight as possible. Construction joints should comply with IS 11817.

4.2.8.1 When the work has to be resumed on a surface which has hardened, such surface shall be roughened. It shall then be swept clean and thoroughly wetted. For vertical joints, neat cement slurry, of workable consistency by using 2 kgs of cement per sqm shall be applied on the surface before it is dry. For horizontal joints, the surface shall be covered with a layer of mortar about 10-15 mm thick composed of cement and sand in the same ratio as the cement and sand in concrete mix. This layer of cement slurry of mortar shall be freshly mixed and applied immediately before placing of the concrete.

4.2.8.2 Where the concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle brushes, care being taken to avoid dislodgement of particles of coarse aggregate. The surface shall be thoroughly wetted and all free water removed. The surface shall then be coated with neat cement slurry @ 2 kgs of cement per sqm. On this surface, a layer of concrete not exceeding 150 mm in thickness shall first be placed and shall be well rammed against old work particular attention being paid to corners and close spots; work, thereafter, shall proceed in the normal way.

4.2.10 Curing: Curing is the process of preventing loss of moisture from the concrete. The following methods shall be employed for effecting curing.

4.2.10.1 Moist Curing: Exposed surfaces of concrete shall be kept continuously in a damp or wet condition by ponding or by covering with a layer of sacking, canvas, Hessian or similar materials and kept constantly wet for at least 7 days from the date of placing concrete in case of ordinary Portland cement and at least 10 days where mineral admixtures or blended cements are used. The period of curing shall not be less than 10 days for concrete exposed to dry and hot weather conditions. In the case of concrete where mineral admixtures or blended cements are used, it is recommended that above minimum periods may be extended to 14 days.

4.2.10.2 Membrane Curing: Approved curing compounds may be used in lieu of moist curing with the permission of the Engineer-in-Charge. Such compound shall be applied to all exposed surfaces of the concrete as soon as possible after the concrete has set. Impermeable membrane such as polythene sheet covering the concrete surface may also be used to provide effective barrier against the evaporation.

4.2.10.3 Freshly laid concrete shall be protected from rain by suitable covering.

4.2.10.4 Over the foundation concrete, the masonry work may be started after 48 hours of its compaction but the curing of exposed surfaces of cement concrete shall be continued along with the masonry work for at least 7 days. And where cement concrete is used as base concrete for flooring, the flooring may be commenced before the curing period of base concrete is over but the curing of base concrete shall be continued along with top layer of flooring for a minimum period of 7 days.

4.2.11 Testing of Concrete: Testing of concrete shall be done as described in chapter of R.C.C in CPWD Specifications 2019.

4.2.12 Form Work: Form work shall be as specified in R.C.C. in CPWD Specifications 2019 chapter and shall be paid for separately unless otherwise specified.

4.2.13 Finishes: Plastering and special finishes other than those, obtained through form work shall be specified and paid for separately unless otherwise specified.

4.2.14 Durability of Concrete: A durable concrete is one that performs satisfactorily in the working environment during its anticipated exposure conditions during service **life**. The materials and mix proportions shall be such as to maintain its integrity and, if applicable, to protect reinforcement from corrosion.

The factors influencing durability include:

- (a) The environment;
- (b) The cover to embedded steel;
- (c) The type and quality of constituent materials;
- (d) The cement content and water/ cement ratio of the concrete;
- (e) Workmanship, to obtain full compaction and efficient curing; and
- (f) The shape and size of the member.

4.3 DAMP PROOF COURSE

4.4.1 Cement Concrete Layer: This shall consist of cement concrete of specified proportions and thickness. The surface of brick or stone masonry work shall be levelled and prepared before laying the cement concrete. Edge of damp proof course shall be straight, even and vertical. Side shuttering shall consist of steel forms and shall be strong and properly fixed so that it does not get disturbed during compaction and the mortar does not leak through. The concrete mix shall be of workable consistency and shall be tamped thoroughly to make a dense mass. When the sides are removed, the surface should come out smooth without honey-coming. Continuity shall be maintained while laying the cement concrete layer and laying shall be terminated only at the predetermined location where damp proof course is to be discontinued. There shall be no construction joints in the Damp Proof Course.

4.4.2 Curing: Damp proof course shall be cured for at least seven days, after which it shall be allowed to dry.

5.0 REINFORCED CEMENT CONCRETE WORK

5.1 GENERAL: Reinforced cement concrete work may be cast-in-situ or Precast as may be directed by Engineer-in-Charge according to the nature of work. Reinforced cement concrete work shall comprise of the following which may be paid separately or collectively as per the description of the item of work.

- (a) Form work (Centering and Shuttering)
- (b) Reinforcement
- (c) Concreting: (1- Cast-in-situ), (2 - Precast)

5.2 MATERIALS

5.1.1 Water, cement, fine and coarse aggregate shall be as specified under respective clauses of chapter 03 mortars and chapter 04 concrete work as applicable.

5.1.2 Fly Ash admixed cement concrete (FACC) and fly ash Blended cements in Cement Concrete (PPCC) in RCC structures.

5.1.2.0 Fly ash Blended Cements conforming to IS 1489 (Part I) may be used in RCC structures as per guidelines given below :

5.1.2.1 General

(i) IS 456- 2000 Code of Practice for Plain and Reinforced Concrete (as amended up to date) shall be followed in regard to Concrete Mix Proportion and its production as under :

- (a) The concrete mix design shall be done as "Design Mix Concrete" as prescribed in clause-9 of IS 456 mentioned above.
- (b) Concrete shall be manufactured in accordance with clause 10 of above mentioned IS 456 covering quality assurance measures both technical and organizational, which shall also necessarily require a qualified Concrete Technologist to be available during manufacture of concrete for certification of quality of concrete.

(ii) Minimum M -25 grade of concrete shall be used in all structural elements made with RCC both in load bearing and framed structure.

(iii) The mechanical properties such as modulus of elasticity, tensile strength, creep and shrinkage of fly ash mixed concrete or concrete using fly ash blended cements (PPCs) are not likely to be significantly different and their values are to be taken same as those used for concrete made with OPC.

(iv) To control higher rate of carbonation in early ages of concrete both in fly ash admixed as well as PPC based concrete, water/binder ratio shall be kept as low as possible, which shall be closely monitored during concrete manufacture.

If necessitated due to low water/binder ratio, required workability shall be achieved by use of chloride free chemical admixtures conforming to IS 9103. The compatibility of chemical admixtures and super plasticizers with each set OPC, fly ash and /or PPC received from different sources shall be ensured by trials.

(v) In environment subjected to aggressive chloride or sulphate attack in particular, use of fly ash admixed or PPC based concrete is recommended. In cases, where structural concrete is exposed to excessive magnesium sulphate, fly ash substitution/content shall be limited to 18% by weight. Special type of cement with low C3A content may also be alternatively used. Durability criteria like minimum binder content and maximum water / binder ratio also need to be given due consideration in such environment.

(vi) Wet curing period shall be enhanced to a minimum of 10 days or its equivalent.

5.1.3 Steel for Reinforcement

5.1.3.1 The steel used for reinforcement shall be any of the following types:

- (a) Mild steel and medium tensile bars conforming to IS 432 (Part I)
- (b) High strength deformed steel bars conforming to IS 1786
- (c) Hard drawn steel wire fabric conforming to IS 1566
- (d) Structural steel conforming to Grade A of IS 2062
- (e) Thermo-mechanically treated (TMT) Bars.

5.1.3.2 Elongation percent on gauge length is $5.65 \sqrt{A}$ where A is the cross sectional areas of the testpiece.

5.1.3.3 Mild steel is not recommended for the use in structures located in earthquake zone subjected to severe damage and for structures subject to dynamic loading (other than wind loading) such as railway and highway bridges.

5.1.3.4 Welding of reinforcement bars covered in this specification shall be done in accordance with the requirements of IS 2751.

Tests: Selection and preparation of Test sample. All the tests pieces shall be selected by the Engineer- in-Charge or his authorized representative either-

- (a) From cutting of barsOr
- (b) If he so desires, from any bar after it has been cut to the required or specified size and the testpiece taken from and any part of it.

In neither case, the test pieces shall be detached from the bar or coil except in the presence of the Engineer-in-Charge or his authorized representative.

The test pieces obtained in accordance with as above shall be full sections of the bars as rolled and subsequently cold worked and shall be subjected to physical tests without any further modifications. No deduction in size by machining or otherwise shall be permissible. No test piece shall be enacted or otherwise subject to heat treatment. Any straightening which a test piece may require shall be done cold.

5.1.3.5 Thermo Mechanically treated reinforcement bars:

- (a) There is no BIS code for TMT bars. The available code BIS 1786 pertains to HSD Bars. Therefore there should be no stipulation that TMT bars should conform to relevant BIS code.
- (b) The TMT bars are being produced under valid licence from either of the firms namely Tempcore, Thermex Evcon Turbo & Turbo Quench. These firms have acquired patents and are giving licences to various producers to produce TMT Bars.
- (c) The TMT bars shall conform to IS 1786 pertaining to Fe 415 D or Fe 500 D or Fe grade of steel as specified.
- (d) In design and construction of reinforced concrete building in seismic zone III and above, steel reinforcement of Grade Fe 415 D shall be used. However, high strength deformed steel bars, produced by thermo mechanical treatment process of grade Fe 415, Fe 500 and Fe 550 having elongation more than 14.5. % and conform to other requirements of Fe 415 D, Fe 500 D and Fe 550 D respectively of IS 1786 may also be used for reinforcement. In future, latest provision of IS 456 and IS 13920 or any other relevant code as modified from time to time shall be applicable.

5.1.4 Stacking and Storage: Steel for reinforcement shall be stored in such a way as to prevent distorting and corrosion. Care shall be taken to protect the reinforcement from exposure to saline atmosphere during storage, fabrication and use. It may be achieved by treating the surface of reinforcement with cement wash or by suitable methods. Bars of different classifications, sizes and lengths shall be stored separately to facilitate issue in such sizes and lengths to cause minimum wastage in cutting from standard length.

5.1.5 Identification: Care shall also be taken to properly identify these bars at site. The staff shall be specially trained for looking for identification marks on these bars given by the manufacturers which are generally given colour code. It will be advisable to see that only one type/grade of bars are brought to site and used in the project after conducting tests for each lot.

5.2 FORM WORK (CENTRING & SHUTTERING)

5.2.1 Form Work: Form work shall include all temporary or permanent forms or moulds required for forming the concrete which is cast-in-situ, together with all temporary construction required for their support.

5.2.2 Design & Tolerance in Construction: Form work shall be designed and constructed to the shapes, lines and dimensions shown on the drawings with the tolerance given below.

(a)	Deviation from specified dimension of crosssection of columns and beams	+10 mm -5 mm
(b)	Deviation from dimensions of footings	
	(i) Dimension in Plan	(+ 50 mm (-10 mm)
	(ii) Eccentricity in plan	0.02 times the width of the footing in the direction of deviation but not more than 50 mm.
	(iii) Thickness	+50 mmOr ± 0.05 times the specified thickness whichever is less

(Note- These tolerance apply to concrete dimensions only, and not to positioning of vertical steel ordowels).

5.2.3 General Requirement: It shall be strong enough to withstand the dead and live loads and forces caused by ramming and vibrations of concrete and other incidental loads, imposed upon it during and after casting of concrete. It shall be made sufficiently rigid by using adequate number of ties and braces, screw jacks or hard boardwedges where required shall be provided to make up any settlement in the form work either before orduring the placing of concrete.

Form shall be so constructed as to be removable in sections in the desired sequence, without damaging the surface of concrete or disturbing other sections, care shall be taken to see that no pieceis keyed into the concrete.

5.2.3.1 Material for Form Work

(a) *Propping and Centering:* All propping and centering should be either of steel tubes with extension pieces or built up sections of rolled steel.

5.2.3.2 (a) Centering/Staging : Staging should be as designed with required extension pieces as approved by Engineer-in-Charge to ensure proper slopes, as per design for slabs/ beams etc. and as per levels as shown in drawing. All the staging to be either of Tubular steel structure with adequate bracings as approved or made of built up structural sections madeform rolled structural steel sections.

(b) In case of structures with two or more floors, the weight of concrete, centering and shuttering of any upper floor being cast shall be suitably supported on one floor below the top most floor already cast.

(c) Form work & concreting of upper floor shall not be done until concrete of lower floor has set at least for 14 days.

5.2.3.3 Shuttering: Shuttering used shall be of sufficient stiffness to avoid excessive deflection and joints shall be tightly butted to avoid leakage of slurry. If required, rubberized lining of material as approved by the Engineer-in-Charge shall be provided in the joints. Steel shuttering used or concreting should be sufficiently stiffened. The steel shuttering should also be properly repaired before use and properly cleaned to avoid stains, honey combing, seepage of slurry through joints etc.

(a) *Runner Joists:* RSJ, MS Channel or any other suitable section of the required size shall be used as runners.

(b) Assembly of beam head over props. Beam head is an adopter that fits snugly on the head plates of props to provide wider support under beam bottoms.

(c) Only steel shuttering shall be used, except for unavoidable portions and very small works for which 12 mm thick water proofing ply of approved quality may be used.

5.2.3.4 Form work shall be properly designed for self weight, weight of reinforcement, weight of fresh concrete, and in addition, the various live loads likely to be imposed during the construction process (such as workmen, materials and equipment). In case the height of centering exceeds 3.50 metres, the prop may be provided in multi-stages

5.2.3.5 Camber: Suitable camber shall be provided in horizontal members of structure, especially in cantilever spans to counteract the effect of deflection. The form work shall be so assembled as to provide for camber. The camber for beams and slabs shall be 4 mm per metre (1 to 250) or as directed by the Engineer-in- Charge, so as to offset the subsequent deflection, For cantilevers the camber at free end shall be 1/50th of the projected length or as directed by the Engineer-in-Charge.

5.2.3.6 Walls: The form faces have to be kept at fixed distance apart and an arrangement of wall ties with spacer tubes or bolts is considered best.

5.2.3.7 Removal of Form work (Stripping Time): In normal circumstance and where various types of cements are used, forms, may generally be removed after the expiry of the following periods:

Type of Form work	Minimum period Before Striking Form work for OPC 33 grade	Minimum period Before Striking Form work for OPC43 grade	Minimum period Before Striking Form work for PPC
(a) Vertical form work to columns, walls, beams	16-24 h	16-24 h	24-36 h
Type of Form work	Minimum period Before Striking Form work for OPC 33 grade	Minimum period Before Striking Form work for OPC 43 grade	Minimum period Before Striking Form work for PPC
(b) Soffit form work to slabs (Props to be refixed immediately after removal of formwork)	3 days	3 days	4 days
(c) Soffit form work to beams (Props to be refixed immediately after removal of formwork)	7 days	7 days	10 days
(d) Props to slabs:			
(1) Spanning upto 4.5m	7 days	7 days	10 days
(2) Spanning over 4.5m	14 days	14 days	20 days
(e) Props to beams and arches:			
(1) Spanning upto 6m	14 days	14 days	20 days
(2) Spanning over 6m	21 days	21 days	30 days

Note 1: For other types of cement, the stripping time recommended for ordinary Portland cement may be suitably modified. Generally If Portland Pozzolana or low heat cement or OPC with direct addition of fly ash has been used for concrete, the stripping time will be 10/7 of the period stated for OPC with 43 grade cement above.

Note 2: The number of props left under, their sizes and disposition shall be such as to be able to safely carry the full dead load of the slabs, beam or arch as the case may be together with any live load likely to occur during curing or further construction.

Note 3: For rapid hardening cement, 3/7 of above periods for OPC 33 grade will be sufficient in all cases except for vertical side of slabs, beams and columns which should be retained for at least 24 hours.

Note 4: In case of cantilever slabs and beams, the centering shall remain till structures for counter acting or bearing down have been erected and have attained sufficient strength.

Note 5: Proper precautions should be taken to allow for the decrease in the rate of hardening that occurs with all types of cement in cold weather and accordingly stripping time shall be increased.

Note 6: Work damaged through premature or careless removal of forms shall be reconstructed within 24 hrs.

5.2.4 Surface Treatment

5.2.4.1 Oiling the Surface: Shuttering gives much longer service life if the surfaces are coated with suitable mould oil which acts both as a parting agent and also gives surface protections.

A typical mould oil is heavy mineral oil or purified cylinder oil containing not less than 5% pentachlorophenol conforming to IS 716 well mixed to a viscosity of 70-80 centipoises.

After 3-4 uses and also in cases when shuttering has been stored for a long time, it should be recoated with mould oil before the next use.

The second categories of shuttering oils / leavening agents are Polymer based water soluble Compounds. They are available as concentrates and when used diluted with water in the ratio of 1:20 or as per manufacturer specifications. The diluted solution is applied by brush applications on the shuttering both of steel as well as ply wood. The solution is applied after every use.

5.2.4.2 The design of form work shall conform to sound Engineering practices and relevant IS codes.

5.2.5 Inspection of Form Work: The completed form work shall be inspected and approved by the Engineer-in-Charge before thereinforcement bars are placed in position.

Proper form work should be adopted for concreting so as to avoid honey combing, blow holes, grout loss, stains or discoloration of concrete etc. Proper and accurate alignment and profile of finished concrete surface will be ensured by proper designing and erection of form work which will be approved by Engineer-in-Charge.

Shuttering surface before concreting should be free from any defect/ deposits and full cleaned so as to give perfectly straight smooth concrete surface. Shuttering surface should be therefore checked for any damage to its surface and excessive roughness before use.

5.2.5.1 Erection of Form Work (Centering and shuttering): Following points shall be borne in mind while checking during erection.

- (a) Any member which is to remain in position after the general dismantling is done, should be clearly marked.
- (b) Material used should be checked to ensure that, wrong items/ rejects are not used.
- (c) If there are any excavations nearby which may influence the safety of form works, corrective and strengthening action must be taken.
- (d)
 - (i) The bearing soil must be sound and well prepared and the sole plates shall bear well on the ground.
 - (ii) Sole plates shall be properly seated on their bearing pads or sleepers.
 - (iii) The bearing plates of steel props shall not be distorted.
 - (iv) The steel parts on the bearing members shall have adequate bearing areas.
- (e) Safety measures to prevent impact of traffic, scour due to water etc. should be taken. Adequate precautionary measures shall be taken to prevent accidental impacts etc.
- (f) Bracing, struts and ties shall be installed along with the progress of form work to ensure strength and stability of form work at intermediate stage. Steel sections (especially deep sections) shall be adequately restrained against tilting, over turning and form work should be restrained against horizontal loads. All the securing devices and bracing shall be tightened.
- (g) The stacked materials shall be placed as catered for, in the design.
- (h) When adjustable steel props are used. They should:
 - 1. be undamaged and not visibly bent.
 - 2. have the steel pins provided by the manufacturers for use.
 - 3. be restrained laterally near each end.
 - 4. have means for centralizing beams placed in the forkheads.
- (i) Screw adjustment of adjustable props shall not be over extended.
- (j) Double wedges shall be provided for adjustment of the form to the required position wherever any settlement/ elastic shorting of props occurs. Wedges should be used only at the bottom end of single prop. Wedges should not be too steep and one of the pair should be tightened/ clamped down after adjustment to prevent shifting.
- (k) No member shall be eccentric upon vertical member.
- (l) The number of nuts and bolts shall be adequate.
 - (a) All provisions of the design and/or drawings shall be complied with.
 - (b) Cantilever supports shall be adequate.
 - (c) Props shall be directly under one another in multistage constructions as far as possible.
 - (d) Guy ropes or stays shall be tensioned properly.
 - (e) There shall be adequate provision for the movements and operation of vibrators and other construction plant and equipment.
 - (f) Required camber shall be provided over long spans.
 - (g) Supports shall be adequate, and in plumb within the specified tolerances.

5.2.2 MEASUREMENTS

5.2.2.1 General: The form work shall include the following:

- (a) Splayed edges, notching, allowance for overlaps and passing at angles, sheathing battens, strutting, bolting, nailing, wedging, easing, striking and removal.
- (b) All supports, struts, braces, wedges as well as mud sills, piles or other suitable arrangements to support the form work.

- (c) Bolts, wire, ties, clamps, spreaders, nails or any other items to hold the sheathing together.
- (d) Working scaffolds, ladders, gangways, and similar items.
- (e) Filletting to form stop chamfered edges of splayed external angles not exceeding 20mm wide to beams, columns and the like.
- (f) Where required, the temporary openings provided in the forms for pouring concrete, inserting vibrators, and cleaning holes for removing rubbish from the interior of the sheathing before pouring concrete.
- (g) Dressing with oil to prevent adhesion and
- (h) Raking or circular cutting

5.2.2.2 Classification of Measurements: Where it is stipulated that the form work shall be paid for separately, measurements shall be taken of the area of shuttering in contact with the concrete surface. Dimensions of the form work shall be measured correct to a cm. The measurements shall be taken separately for the following.

- (a) Foundations, footings, bases of columns etc. and for mass concrete
- (b) Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.
- (c) Suspended floors, roofs, landings, shelves and their supports and balconies.
- (d) Lintels, beams, plinth beams, girders, bressummers and cantilevers.
- (e) Columns, pillars, piers, abutments posts and struts.
- (f) Stairs (excluding landings) except spiral staircase.
- (g) Spiral staircases (including landings).
- (h) Arches, Domes, vaults, shells roofs, arch ribs, curvilinear shaped folded plates
- (i) Extra for arches, domes, vaults exceeding 6 m span other than curvilinear shaped
- (j) Chimneys and shafts.
- (k) Well steining.
- (l) Vertical and horizontal fins individually or forming box, louvers and bands, fascias and eaves board
- (m) Waffle or ribbed slabs.
- (n) Edges of slabs and breaks in floors and walls (to be measured in running metres where below 200 mm in width or thickness).
- (o) Cornices and mouldings.
- (p) Small surfaces, such as cantilevers ends, brackets and ends of steps, caps and boxes to pilasters and columns and the like.
- (q) Chullah hoods, weather shades, chajjas, corbels etc. including edges and
- (r) Elevated water reservoirs.

5.2.2.3 Centering, and shuttering where exceeding 3.5 metre height in one floor shall be measured and paid for separately.

5.2.2.4 Where it is not specifically stated in the description of the item that form work shall be paid for separately, the rate of the RCC item shall be deemed to include the cost of form work.

5.2.2.5 No deductions from the shuttering due to the openings/ obstructions shall be made if the area of each openings/ obstructions does not exceed 0.4 square metre. Nothing extra shall be paid for forming such openings.

5.2.5.2 Form work of elements measured under categories of arches, arch ribs, domes, spiral staircases, well steining, shell roofs, curvilinear folded plates & curvilinear eaves board, circular shafts & chimneys shall not qualify for extra rate for circular work.

5.2.5.3 Extra for circular work shall be admissible for surfaces circular or curvilinear in plan or in elevation beyond the straight edge of supporting beam in respective mode of measurement. However, there may be many different types of such structures. In such cases, extra payment shall be made judiciously after deducting areas where shuttering for circular form work is not involved.

5.2.6 Rate: The rate of the form work includes the cost of labour and materials required for all the operations described above.

5.3 REINFORCEMENTS

5.3.1 General Requirements: Steel conforming to para 5.1.3 for reinforcement shall be clear and free from loose mill scales, dust, loose rust, coats of paints, oil or other coating which may destroy or reduce bond. It shall be stored in such a way as to avoid distortion and to prevent deterioration and corrosion. Prior to assembly of reinforcement on no account any oily substance shall be used for removing the rust.

5.3.1.1 Assembly of Reinforcement: Bars shall be bent correctly and accurately to the size and shape as shown in the detailed drawing or as directed by Engineer- in-Charge. Preferably bars of full length shall be used. Necessary cutting and straightening is also included. Overlapping of bars, where necessary shall be done as directed by the Engineer-in-Charge. The overlapping bars shall not touch each other and these shall be kept apart with concrete between them by 25mm or $1\frac{1}{2}$ times the maximum size of the coarse aggregate whichever is greater. But where this is not possible, the overlapping bars shall be bound together at intervals not exceeding twice the dia. of such bars with two strands annealed steel wire of 0.90 mm to 1.6 mm twisted tight. The overlaps/ splices shall be staggered as per directions of the Engineer-in-Charge. But in no case the overlapping shall be provided in more than 50% of cross sectional area at one section.

5.3.1.2 Bonds and Hooks Forming End Anchorages: Reinforcement shall be bent and fixed in accordance with procedure specified in IS 2502, code of practice of bending and fixing of bars for concrete reinforcement. The details of bends and hooks are shown below for guidance.

(a) *U-Type Hook:* In case of mild steel plain bars standard U type hook shall be provided by bending ends of rod into semicircular hooks having clear diameter equal to four times the diameter of the bar.

Note: In case of work in seismic zone, the size of hooks at the end of the rod shall be eight times the diameter of bar or as given in the structural drawings.

(b) *Bends:* Bend forming anchorage to a M.S. plain bar shall be bent with an internal radius equal to two times the diameter of the bar with a minimum length beyond the bend equal to four times the diameter of the bar.

5.3.1.3 Anchoring Bars in Tension: Deformed bars may be used without end anchorages provided, development length equipment is satisfied. Hooks should normally be provided for plain bars in tension. Development length of bars will be determined as per IS: 456.

5.3.1.4 Anchoring Bars in Compression: The anchorage length of straight bar in compression shall be equal to the 'Development length' of bars in compression as specified in IS: 456. The projected length of hooks, bend and straight lengths beyond bend, if provided for a bar in compression, shall be considered for development length.

5.3.1.5 Binders, stirrups, links etc.: In case of binders, stirrups, links etc. the straight portion beyond the curve at the end shall be not less than eight times the nominal size of bar.

5.3.3.4 Bending at Construction Joints: Where reinforcement bars are bent aside at construction joints and afterwards bent back into their original position care should be taken to ensure that at no time the radius of the bend is less than 4 bar diameters for plain mild steel or 6 bar diameter for deformed bars. Care shall also be taken when bending back bars to ensure that the concrete around the bar is not damaged.

5.3.3.5 Cover: The minimum nominal cover to meet durability requirements shall be as under:-

Exposure	Nominal Concrete cover in mm not less than
Mild	20
Moderate	30
Severe	45
Very severe	50
Extreme	75

Notes: 1. For main reinforcement upto 12 mm diameter bar for mild exposure the nominal cover may be reduced by 5 mm.

2. Unless specified otherwise, actual concrete cover should not deviate from the required nominal cover by + 10 mm.

3. For exposure condition 'severe' and 'very severe' reduction of 5 mm may be made, where concrete grade is M35 and above.

4. Nominal cover to meet specified period of fire resistance shall not be less than as given in Table 16A of IS 456.

5.3.4 Measurement: Reinforcement including authorized spacer bars and lappages shall be measured in length of different diameter, as actually (not more than as specified in the drawings.) used in the work nearest

to a centimetre and their weight calculated on the basis of standard weight given in Table 5.4 below. In case actual unit weight of the bars is less than standard unit weight, but within variation, in such cases weight of reinforcement shall be calculated on the basis of actual unit weight. Wastage and unauthorized overlaps shall not be paid for. Annealed steel wire required for binding or tack welding shall not be measured, its cost being included in the rate of reinforcement.

Where tack welding is used in lieu of binding, such welds shall not be measured. Chairs separator etc. shall be provided as directed by the Engineer-in-Charge and measured separately and paid for.

TABLE 5.4
Cross Sections Area and Mass of Steel Bar

<i>Nominal Size mm</i>	<i>Cross sectional Area Sq.mm</i>	<i>Mass per metre Run Kg.</i>
6	28.3	0.222
8	50.3	0.395
10	78.6	0.617
12	113.1	0.888
16	201.2	1.58
20	314.3	2.47
25	491.1	3.85
28	615.8	4.83
32	804.6	6.31
36	1018.3	7.99
40	1257.2	9.86

Note: These are as per clause 6.2 of IS 1786.

STEEL FOR REINFORCEMENT READY TO USE "CUT & BEND"

5.3A.1 Cut and bend rebars are customised reinforced steel bars required at construction sites. These shall be made from specialized machinery ensuring exact precision, ready to use pre-cut and pre-bent as per approval drawings. The steel used for reinforcement shall be the following types.

(a) Thermo-mechanically treated (TMT) Bars.

5.3A.2 Elongation percent on gauge length is 5.65A, where A is the cross sectional area of the test piece.

5.3A.3 Welding of reinforcement bars covered in this specification shall be done in accordance with the requirement of IS 2751.

5.3 Thermo Mechanically treated reinforcement bars:

(a) There is no BIS code for TMT bars. The available code BIS 1786 pertains to HSD Bars. Therefore there should be no stipulation that TMT bars should conform to relevant BIS code.

(b) The TMT bars are being produced under valid licence from either of the firms namely Tempcore, Thermex Evcon Turbo & Turbo Quench. These firms have acquired patents and are giving licences to various producers to produce TMT Bars.

(c) The TMT bars shall conform to IS 1786 pertaining to Fe 500 D or Fe grade of steel as specified.

(d) In design and construction of reinforcement concrete building in seismic zone III and above, steel reinforcement of Grade Fe 415 D shall be used. However, high strength deformed steel bars, produced by thermomechanical treatment process of grade Fe500 and Fe 550 having elongation more than 14.5% and conform to other requirements of Fe 500 D and Fe 550 D respectively of IS 1786 may also be used for reinforcement. In future, latest provision of IS 456 and IS 13920 or any other relevant code as modified from time to time shall be applicable.

Assembly of Rebars

5.3A.7.1 The rebars shall be bend correctly and precisely to the size and shape as shown in the detailed drawing or as directed by Engineer-in-charge. Overlapping of bars, where necessary shall be done as directed by the Engineer-in-charge. The overlapping bars shall not touch each other and these shall be kept apart with concrete between them by 25 mm or 1¼ times the maximum size of the coarse aggregate whichever is greater. But where this is not possible, the overlapping bars shall be bound together at intervals not exceeding twice the dia. of such bars with two strands annealed steelwire of 0.90 mm to 1.6 mm twisted light. The overlaps/splices shall be staggered as per direction of the Engineer-in-charge. But in no case the overlapping shall be provided in more than 50% of cross sectional area at one section.

5.3A.7.2 Bonds and Hooks Forming End Anchorages:- Reinforcement shall be bent and fixed in accordance with procedure specified in IS 2502, code of practice of bending and fixing of bars for concrete reinforcement.

5.3A.7.3 Anchorages Bars in Tension:- Deformed bars may be used without end anchorages. Development length of bars will be determined as per IS: 456.

5.3A.7.4 Anchorages Bars in Compression:- The anchorages length of straight bar in compression shall be equal to the 'Development length' of bars in compression as specified in IS: 456. The projected length of bend and straight length beyond bend, if provided for a bar in compression, shall be considered for development length.

5.3A.7.5 Binders, stirrups, link etc:- In case of binders, stirrups, link etc. the straight portion beyond the curve at the end shall be not less than eight times the nominal size of bar.

5.3 CONCRETING

5.4.0 The concrete shall be as specified under chapter 4 concrete work. The proportion by volume or by the weight of ingredients shall be as specified.

5.4.1 Consistency: The concrete which will flow sluggishly into the forms and around the reinforcement without any segregation of coarse aggregate from the mortar shall be used. The consistency shall depend on whether the concrete is vibrated or hand tamped, it shall be determined by slump test as prescribed in sub-head "concrete" under workability – requirement.

5.4.2 Placing of Concrete

5.4.2.1 Concreting shall be commenced only after Engineer-in-Charge has inspected the centering, shuttering and reinforcement as placed and passed the same. Shuttering shall be clean and free from all shavings, saw dust, pieces of wood, or other foreign material and surfaces shall be treated as prescribed in 5.2.4.

5.4.2.2 In case of concreting of slab and beams, wooden plank or cat walks of chequered MS plated or bamboo chalis or any other suitable material supported directly on the centering by means of wooden blocks or lugs shall be provided to convey the concrete to the place of deposition without disturbing the reinforcement in any way. Labour shall not be allowed to walk over the reinforcement.

5.4.2.3 In case of columns and wall, it is desirable to place concrete without construction joints. The progress of concreting in the vertical direction, shall be restricted to one metre per hour.

5.4.2.4 The concrete shall be deposited in its final position in a manner to preclude segregation of ingredients. In deep trenches and footings concrete shall be placed through chutes or as directed by the Engineer-in-Charge. In case of columns and walls, the shuttering shall be so adjusted that the vertical drop of concrete is not more than 1.5 metres at a time.

5.4.2.5 During cold weather, concreting shall not be done when the temperature falls below 4.5°C. The concrete placed shall be protected against frost by suitable covering. Concrete damaged by frost shall be removed and work redone.

5.4.2.6 During hot weather precaution shall be taken to see that the temperature of wet concrete does not exceed 38°C. No concrete shall be laid within half an hour of the closing time of the day, unless permitted by the Engineer-in-Charge.

5.4.2.7 It is necessary that the time between mixing and placing of concrete shall not exceed 30 minutes so that the initial setting process is not interfered with.

5.4.3 Compaction: It shall be as specified in sub-head of Concrete Work of this specification.

5.4.3.1 Concrete shall be compacted into dense mass immediately after placing by means of mechanical vibrators designed for continuous operations complying with IS 2505, IS 2506, IS 2514 and IS 4656. The Engineer-in-Charge may however relax this condition at his discretion for certain items depending on the thickness of the members and feasibility of vibrating the same and permit hand compaction instead. Hand compaction shall be done with the help of tamping rods so that concrete is thoroughly compacted and completely worked around the reinforcement, embedded fixtures, and into corners of the form. The layers of concrete shall be so placed that the bottom layer does not finally set before the top layer is placed. The vibrators shall maintain the whole of concrete under treatment in an adequate state of agitation; such that de-aeration and effective compaction is attained at a rate commensurate with the supply of concrete from the mixers. The vibration shall continue during the whole period occupied by placing of concrete, the vibrators being adjusted so that the centre of vibrations approximates to the centre of the mass being compacted at the time of placing.

5.4.3.2 Concrete shall be judged to be properly compacted, when the mortar fills the spaces between the

coarse aggregate and begins to cream up to form an even surface. When this condition has been attained, the vibrator shall be stopped in case of vibrating tables and external vibrators. Needle vibrators shall be withdrawn slowly so as to prevent formation of loose pockets in case of internal vibration. In case both internal and external vibrators are being used, the internal vibrator shall be first withdrawn slowly after which the external vibrators shall be stopped so that no loose pocket is left in the body of the concrete. The specific instructions of the makers of the particular type of vibrator used shall be strictly complied with. Shaking of reinforcement for the purpose of compaction should be avoided. Compaction shall be completed before the initial setting starts, i.e. with 30 minutes of addition of water to the dry mixture.

5.4.4 Expansion Joints: Expansion joints shall be provided as per CPWD Specifications 2019 or as directed by Engineer-in-Charge, for the purpose of general guidance. However it is recommended that structures exceeding 45 m in length shall be divided by one or more expansion joints. The filling of these joints with bitumen filler, bitumen felt or any such material and provision of copper plate, etc. shall be paid for separately in running metre. The measurement shall be taken two places of decimal stating the depth and width of joint.

5.4.5 Curing: After the concrete has begun to harden i.e. about 1 to 2 hours after its laying, it shall be protected from quick drying by covering with moist gunny bags, sand, canvass Hessian or any other material approved by the Engineer-in-Charge. After 24 hours of laying of concrete, the surface shall be cured by ponding with water for a minimum period of 7 days from the date of placing of concrete in case of OPC and at least 10 days where mineral admixtures or blended cements are used. The period of curing shall not be less than 10 days for concrete exposed to dry and hot weather condition.

5.4.6 Rectification of Surface defects of Minor nature: Immediately on removal of forms, the R.C.C. work shall be examined by the Engineer-in-Charge, before any defects are made good.

5.4.7 Testing of Concrete

5.4.9.0 Regular mandatory tests on the workability of the fresh concrete shall be done to achieve the specified compressive strength of concrete. These will be of two types

- (a) Mandatory Lab, Test
- (b) Mandatory Field Test

Results of Mandatory Field Test will prevail over mandatory Lab. Test.

5.4.9.1 Cube Test for Compressive Strength of Concrete - Mandatory Lab Test: Mandatory tests shall be carried out as prescribed in CPWD Specifications 2019.

5.4.9.2 Additional Test: Additional test, if required, shall be carried out as prescribed in CPWD Specifications 2019.

5.4.9.3 Slump Test: This test shall be carried out as prescribed in CPWD Specifications 2019.

5.4.8 Standard of Acceptance – for Nominal Mix

5.4.8.1 Mandatory Lab. Test: For concrete sampled and tested as prescribed in Appendix A of Chapter 5, the following requirement shall apply.

5.4.8.2 Out of six sample cubes, three cubes shall be tested at 7 days and remaining three cubes at 28 days.

5.4.8.3 7 days' Tests

Sampling: The average of the strength of three specimen shall be accepted as the compressive strength of the concrete provided the variation in strength of individual specimen is not more than $\pm 15\%$ of the average. Difference between the maximum and minimum strength should not exceed 30% of average strength of three specimens. If the difference between maximum and minimum strength exceeds 30% of the average strength, then 28 days' test shall have to be carried out.

Strength: If the actual average strength of sample accepted in para 'sampling' above is equal to or higher than specified strength upto $\pm 15\%$ then strength of the concrete shall be considered in order.

In case the actual average strength of sample accepted in the above para is lower than the specified or higher by more than 15% then 28 days' test shall have to be carried out to determine the compressive strength of concrete cubes.

5.4.8.4 28 days' Test

- (a) The average of the strength of three specimen be accepted as the compressive strength of the concrete provided the strength of any individual cube shall neither be less than 70% nor higher than 130% of the

specified strength.

- (b) If the actual average strength of accepted sample exceeds specified strength by more than 30% the Engineer-in-Charge, if he so desires, may further investigate the matter. However, if the strength of any individual cube exceeds more than 30% of specified strength, it will be restricted to 130% only for computation of strength.
- (c) If the actual average strength of accepted sample is equal to or higher than specified strength upto 30% then strength of the concrete shall be considered in order and the concrete shall be accepted at full rates.
- (d) If the actual average strength of accepted sample is less than specified strength but not less than 70% of the specified strength, the concrete may be accepted at reduced rate at the discretion of Engineer-in-Charge.
- (e) If the actual average strength of accepted sample is less than 70% of specified strength, the Engineer-in-Charge shall reject the defective portion of work represented by sample and nothing shall be paid for the rejected work. Remedial measures necessary to retain the structure shall be taken at the risk and cost of contractor. If, however the Engineer-in-Charge so desires, he may order additional tests to be carried out to ascertain if the structure can be retained. All the charges in connection with these additional tests shall be borne by the contractor.

5.7 DESIGN MIX

5.8.0 Definition: Design mix concrete is that concrete in which the design of mix i.e. the determination of proportions of cement, aggregate & water is arrived as to have target mean strength for specified grade of concrete. The minimum mix of M25 shall be used in all structural elements in both load bearing & RCC framed construction.

5.8.1 Mix Design and Proportioning

5.8.1.1 Mix proportions shall be designed to ensure that the workability of fresh concrete is suitable for conditions of handling and placing, so that after compaction it surrounds all reinforcement and completely fills the formwork. When concrete is hardened, it shall have the stipulated strength, durability and impermeability.

5.8.1.2 Determination of the proportions by weight of cement, aggregates and water shall be based on design of the mix.

5.8.1.3 As a trial the manufacturer of concrete may prepare a preliminary mix according to provisions of SP: 23. Reference may also be made to ACI 211.1-77 for guidance.

5.8.1.4 Mix design shall be tried and the mix proportions checked on the basis of tests conducted at a recognized laboratory approved by the Engineer-in-Charge.

5.8.1.5 All concrete proportions for various grades of concrete shall be designed separately and the mix proportions established keeping in view the workability for various structural elements, methods of placing and compacting.

5.8.1.6 Before using an admixture in concrete, its performance shall be evaluated by comparing the properties of concrete with the admixture and concrete without any admixture. Chloride content of admixture should be declared by the manufacturer of admixture and shall be within limits stipulated by IS:9103.

5.8.2 Standard Deviation

5.8.2.1 Standard deviation calculations of test results based on tests conducted on the same mix design for a particular grade designation shall be done in accordance with IS 456.

5.8.3 Acceptance Criteria for Design Mix

5.8.3.1 Compressive Strength: The concrete shall be deemed to comply with the strength requirements when both the following condition are met:

- (a) The mean strength determined from any group of four consecutive test results complies with the appropriate limits in col 2 of Table 5.6 in CPWD specifications 2019.
- (b) Any individual test result complies with the appropriate limits in col. 3 of Table 5.6 in CPWD specifications 2019.

5.8.3.2 Flexural Strength: When both the following conditions are met, the concrete complies with the specified flexural strength.

- (a) The mean strength determined from any group of four consecutive test results exceeds the specified

characteristic strength by at least 0.3 N/mm²

- (b) The strength determined from any test result is not less than the specified characteristic strength/ 0.3 N/mm².

5.8.3.3 Quantity of Concrete Represented by Strength Test Results: The quantity of concrete represented by a group of four consecutive test results shall include the batches from which the first and last samples were taken together with all intervening batches.

For the individual test result requirements given in col 3 of Table 5.6 or in item (b) of 5.8.3.2. Only the particular batch from which the sample was taken shall be at risk.

Where the mean rate of sampling is not specified the maximum quantity of concrete that four consecutive test results represent shall be limited to 60 m³.

5.8.3.4 If the concrete is deemed not to comply pursuant to 5.8.3 the structural adequacy of the parts affected shall be investigated and any consequential action as needed shall be taken.

5.8.3.5 Concrete of each grade shall be assessed separately.

5.8.3.6 Concrete is liable to be rejected if it is porous or honey-combed, its placing has been interrupted without providing a proper construction joint, the reinforcement has been displaced beyond the tolerances specified, or construction tolerances have not been met. However, the hardened concrete may be accepted after carrying out suitable remedial measured to the satisfaction of the Engineer- in-Charge.

5.8.4 Cement Content of Concrete

5.8.4.1 For all grades of concrete manufactured/produced, minimum cement content in the concrete shall be 330 kg per cubic metre of concrete. Also, irrespective of the grade of concrete the maximum cement content shall not be more than 500 kg per cubic metre of concrete. These limitations shall apply for all types of cements of all strengths.

5.8.4.2 Actual cement content in each grade of concrete for various conditions of variable shall be established by design mixes within the limits specified in para 5.8.4.1 above.

5.8.5 Water Cement Ratio and Slump

5.8.5.1 In proportioning a particular mix, the manufacturer/ producer/ contractor shall give due consideration to the moisture content in the aggregates, and the mix shall be so designed as to restrict the maximum free water cement ratio to less than 0.5.

5.8.5.2 Due consideration shall be given to the workability of the concrete thus produced. Slump shall be controlled on the basis of placement in different situations. For normal methods of placing concrete, maximum slump shall be restricted to 100 mm when measured in accordance with IS 1199.

5.8.6 Approval of Design Mix

5.8.6.1 The producer/ manufacturer/ contractor of concrete shall submit details of each trial mix of each grade of concrete designed for various workability conditions to the Engineer-in-Charge for his comments and approval. Concrete of any particular design mix and grade shall be produced/manufactured for works only on obtaining written approval of the Engineer-in-Charge.

5.8.6.2 For any change in quality/ quantity in the ingredients of a particular concrete, for which mix has been designed earlier and approved by the Engineer-in-Charge, the mix has to be redesigned and approval obtained again.

5.8 A.2.2 General

(i) IS 456- 2000 Code of Practice for Plain and Reinforced Concrete (as amended up to date) shall be followed in regard to Concrete Mix Proportion and its production as under:

- (a) The concrete mix design shall be done as "Design Mix Concrete" as prescribed in clause-9 of IS 456 mentioned above.
- (b) Concrete shall be manufactured in accordance with clause 10 of above mentioned IS 456 covering quality assurance measures both technical and organizational, which shall also necessarily require a qualified Concrete Technologist to be available during manufacture of concrete for certification of quality of concrete.

(ii) Self-compacting concrete of grade M-50/M-60 shall be used in all structural elements.

If necessitated due to low water/binder ratio, required workability shall be achieved by use of chloride

free chemical admixtures conforming to IS 9103. The compatibility of chemical admixtures and super plasticizers with OPC, received from different sources shall be ensured by trials.

- (v) In cases, where structural concrete is exposed to excessive magnesium sulphate, flyash substitution/content shall be limited to 18% by weight. Special type of cement with low C3A content may also be alternatively used. Durability criteria like minimum binder content and maximum water /binder ratio also need to be given due consideration in such environment.
- (vi) Curing as per provision in IS 456:2000 (with amendment). Wet curing period shall be enhanced to a minimum of 10 days or its equivalent. In hot & arid regions, the minimum curing period shall be 14 days or its equivalent.

5.8A.3 Steel for reinforcement: Steel shall be thermo mechanically treated bar Fe-500D as per IS1786-2008 (with amendments) or more as per as per clause 5.1.3 of CPWD Specification Vol.I, 2019 with upto date correction slips.

5.8A.3.1 Cover: Cover as per IS456:2000 (with amendment) and clause 5.3.3.5 of CPWD Specification Vol.I, 2019.

Concreting: Self-compacting concrete of grade M-50/M-60 for construction of piers, abutments, portal frames, pier caps and bearing pedestals and seismic arresters over pier/ abutment caps at all locations with specified grade using Ordinary Portland Cement (conforming to strength requirement of IS:8112).

5.8A.4.1 Strength of concrete: As per IS 456:2000 with amendments.

5.8A.5 Self Compacting Concrete: Self-compacting concrete shall be able to flow under its own weight and completely fill the formwork, even in the presence of dense reinforcement, without the need of any vibration, whilst maintaining homogeneity.

6.0 MASONRYWORK

6.0. TERMINOLOGY

Bond: The arrangement of the bricks in successive courses to tie the brick work together both longitudinally and transversely. The arrangement is usually designed to ensure that no vertical joint of one course is exactly over the one in the next course above or below it, and there is greatest possible amount of lap.

Bed Joint: Horizontal joint in brick work or masonry.

Closer: Any portion of a brick used in constructing a wall, to close up the bond next to the end brick of a course.

Coping or Weathering: The cover applied over or the geometrical form given to a part of structure to enable it to shed rain water.

Corbel: A cantilever projecting from the face of a wall to form a bearing.

Cornice: Horizontal or ornamental feature projecting from the face of a wall (see Fig. 6.1D)

Course: A layer of bricks including bed mortar.

Cross joint: A joint other than a bed joint normal to the wall face.

Efflorescence: A powdery incrustment of salts left by evaporation. This may be visible on the surface or may be below surface. In the latter case, this is termed as crypto Efflorescence.

Header: A brick laid with its length across the wall.

Indenting: The leaving recesses into which future work can be bonded.

Jamb: The part of the wall at the side of an opening.

Joint: A junction of bricks.

Jointing: The operation of finishing joints as the masonry work proceeds.

Pier: A thickened section forming integral part of the wall placed at intervals along the wall primarily to increase the stiffness of the wall or to carry a vertical concentrated load. The thickness of a pier is the over all thickness including the thickness of the wall, or when bonded into one leaf of a cavity wall the thickness obtained by treating this leaf as an independent wall (see Fig. (6.1A, 6.1B)).

Pillar: Pillar means a detached masonry support. This can be rectangular, circular, elliptical etc. In case of rectangular pillar, the breadth shall not exceed three times the thickness and thickness itself shall not exceed more than thrice the length of brick (See Fig. 6.1C).

Quoin: An external corner in brick work, the term may also denote the brick used to form the quoin.

Scaffolding: A temporary erection of timber or steel work used in the construction, alteration, demolition or repairs of a building to support or to attend of the hoisting or lowering of workmen, their tools and materials. Scaffoldings are of two types, namely single and double scaffoldings. Single scaffolding consists of a row of verticals connected to wall by horizontal supported on and tied to the structure. Double scaffolding consists of two rows of verticals secured or leashed together with horizontal and diagonal bracings forming essentially a structure independent of the building. It may also connect to the structure at convenient points for the sake of better stability.

Sill: A brick work forming the lower boundary of door or window opening (see Fig. 6.1D).

Spandrel: The space between the haunches and the road decking of an arch.

Strecher: A brick laid with its length in the direction of the wall.

String course: A horizontal course projecting from a wall usually introduced at every floor level or windows or below parapet for imparting architectural appearance to the structure and also keeping off the rain water. (see Fig. 6.1D).

Templet: A pattern of sheet metal used as a guide for setting out specific section and shape.

Toothing: Bricks left projecting in alternate courses to bond with future work.

Wall joint: A joint parallel to the wall face.

6.1.1 Dimensions: The brick may be modular or non-modular. Sizes for both types of bricks/tiles shall be as per Table 6.1. While use of modular bricks/tiles is recommended, non-modular (FPS) bricks/tiles can also be used where so specified. Non-modular bricks/tiles of sizes other than the sizes mentioned in Table 6.1 may also be used where specified.

TABLE 6.1

Type of Bricks/ Tiles	Nominal Size mm	Actual Size mm
Modular Bricks	200 × 100 × 100 mm	190 × 90 × 90 mm
Modular tile bricks	200 × 100 × 40 mm	190 × 90 × 40 mm
Non-modular tile bricks	229 × 114 × 44 mm	225 × 111 × 44 mm
Non-modular bricks	229 × 114 × 70 mm	225 × 111 × 70 mm

6.1.2 Classification: Bricks/Brick tiles shall be classified on the basis of their minimum compressive strength as given below:

Class Designation	Average compressive strength			
	Not less than		Less than	
	N/mm ²	(kgf/cm ²)	N/mm ²	(kgf/cm ²)
12.5 (125)	12.5	125	15.0	150
10 (100)	10	100	12.5	125
7.5 (75)	7.5	75	10	100
5 (50)	5	50	7.5	75
3.5 (35)	3.5	35	5.0	50

The bricks shall have smooth rectangular faces with sharp corner and shall be uniform in colour and emit clear ringing sound when struck.

(Note: Upper limits specified in Table 6.2 are for calculating the average compressive strength in accordance with Appendix B of Chapter 6).

6.1.3 Sampling and Tests: Samples of bricks shall be subjected to the following tests:

- Dimensional tolerance.
- Water absorption.
- Efflorescence.
- Compressive strength.

6.1.3.1 Sampling: For carrying out compressive strength, water absorption, efflorescence and dimensional tests, the samples of bricks shall be taken at random according to the size of lot as given in Table 6.3 below. The sample thus taken shall be stored in a dry place until tests are made. For the purpose of sampling, the following definition shall apply.

- Lot:** A collection of bricks of same class and size, manufactured under relatively similar conditions of production. For the purpose of sampling a lot shall contain a maximum, of 50,000 bricks.

In case a consignment has bricks more than 50,000 of the same classification and size and manufactured under relatively similar conditions of production, it shall be divided into lots of 50,000 bricks or part thereof.

- (b) *Sample*: A collection of bricks selected for inspection and/or testing from a lot to reach the decision regarding the acceptance or rejection of the lot.
- (c) *Defective*: A brick failing to meet one or more of the specified requirements.

6.1.3.2 The samples shall be taken as below:

- (i) **Sampling from a Stack**: When it is necessary to take a sample from a stack, the stack shall be divided into a number of real or imaginary sections and the required number of bricks drawn from each section. For this purpose bricks in the upper layers of the stack shall be removed to enable units to be sampled from places within the stack.

Note: For other methods of sampling i.e. sampling in motion and sampling from lorries or trucks, IS: 5454 may be referred.

Scale of sampling and criteria for conformity for visual and dimensional characteristics:—

Visual characteristics: The bricks shall be selected and inspected for ascertaining their conformity to the requirements of the relevant specification.

The number of bricks to be selected from a lot shall depend on the size of lot and shall be in accordance of Col. 1 and 2 of Table 6.3 for visual characteristics in all cases and dimensional characteristics if specified for individual bricks.

- (ii) **Visual Characteristics**: All the bricks selected above in accordance with Col. 1 and 2 of Table 6.3 shall be examined for visual characteristics. If the number of defective bricks found in the sample is less than or equal to the corresponding number as specified in Col. 3 of Table 6.3 the lot shall be considered as satisfying the requirements of visual characteristics, otherwise the lot shall be deemed as not having met the visual requirements.

- (iii) **Dimensional Characteristics**: The number of bricks to be selected for inspecting the dimensions and tolerance shall be in accordance with Col. 1 and 4 of Table 6.3. These bricks will be divided into groups of 20 bricks at random and each of the group of 20 bricks thus formed will be tested for all the dimensions and tolerances. A lot shall be considered having found meeting the requirements of dimensions and tolerance if none of the groups of bricks inspected fails to meet the specified requirements.

6.2.1 Mortar: The mortar for the brick work shall be as specified, and conform to accepted standards. Lime shall not be used where reinforcement is provided in brick work.

6.2.2 Soaking of Bricks: Bricks shall be soaked in water before use for a period for the water to just penetrate the whole depth of the bricks. Alternatively bricks may be adequately soaked in stacks by profusely spraying with clean water at regular intervals for a period not less than six hours. The bricks required for masonry work using mud mortar shall not be soaked. When the bricks are soaked they shall be removed from the tank sufficiently early so that at the time of laying they are skin-dry. Such soaked bricks shall be stacked on a clean place where they are not again spoiled by dirt earth etc.

Note I: The period of soaking may be easily found at site by a field test in which the bricks are soaked in water for different periods and then broken to find the extent of water penetration. The least period that corresponds to complete soaking will be the one to be allowed for in construction work.

Note II: If the bricks are soaked for the required time in water that is frequently changed the soluble salt in the bricks will be leached out, and subsequently efflorescence will be reduced.

6.2.3 Laying

6.2.4.1 Bricks shall be laid in English Bond unless otherwise specified. For brick work in half brick wall, bricks shall be laid in stretcher bond. Half or cut bricks shall not be used except as closer where necessary to complete the bond. Closers in such cases, shall be cut to the required size and used near the ends of the wall. Header bond shall be used preferably in all courses in curved plan for ensuring better alignment.

Note: Header bond shall also be used in foundation footings unless thickness of walls (width of footing) makes the use of headers impracticable. Where thickness of footing is uniform for a number of courses, the top course of footing shall be headers.

6.2.4.2 All loose materials, dirt and set lumps of mortar which may be lying over the surface on which brick work is to be freshly started, shall be removed with a wire brush and surface wetted. Bricks shall be laid on a full bed of mortar,

when laying, each brick shall, be properly bedded and set in position by gently pressing with the handle of a trowel. Its inside face shall be buttered with mortar before the next brick is laid and pressed against it. Joints shall be fully filled and packed with mortar such that no hollow space are left inside the joints.

6.2.4.3 The walls shall be taken up truly in plumb or true to the required batter where specified. All courses shall be laid truly horizontal and all vertical joints shall be truly vertical. Vertical joints in the alternate course shall come directly one over the other. Quoin, Jambs and other angles shall be properly plumbed as the work proceeds. Care shall be taken to keep the perpend properly aligned within following maximum permissible tolerances :

- (a) Deviation from vertical within a storey shall not exceed 6 mm per 3 m height.
- (b) Deviation in verticality in total height of any wall of building more than one storey in height shall not exceed 12.5 mm.
- (c) Deviation from position shown on plan of any brick work shall not exceed 12.5 mm.
- (d) Relative displacement between load bearing wall in adjacent storeys intended to be vertical alignments shall not exceed 6 mm.
- (e) A set of tools comprising of wooden straight edge, masonic spirit levels, square, 1 metre rule line and plumb shall be kept on the site of work for every 3 masons for proper check during the progress of work.

6.2.4.4 All quoins shall be accurately constructed and the height of brick courses shall be kept uniform. This will be checked using graduated wooden straight edge or storey rod indicating height of each course including thickness of joints. The position of damp proof course, window sills, bottom of lintels, top of the wall etc. along the height of the wall shall be marked on the graduated straight edge or storey rod. Acute and obtuse quoins shall be bonded, where practicable in the same way as square quoins. Obtuse quoins shall be formed with squint showing three quarters brick on one face and quarter brick on the other.

6.2.4.5 The brick work shall be built in uniform layers.

No part of the wall during its construction shall rise more than one metre above the general construction level. Parts of wall left at different levels shall be raked back at an angle of 45 degrees or less with the horizontal. Tothing shall not be permitted as an alternative to raking back. For half brick partition to be keyed into main walls, indents shall be left in the main walls.

6.2.4.6 All pipe fittings and specials, spouts, hold fasts and other fixtures which are required to be built into the walls shall be embedded, as specified, in their correct position as the work proceeds unless otherwise directed by the Engineer-in-Charge.

Top courses of all plinths, parapets, steps and top of walls below floor and roof slabs shall be laid with brick on edge, unless specified otherwise. Brick on edge laid in the top courses at corner of walls shall be properly radiated and keyed into position to form cut (maru) corners as shown in Fig 6.4. Where bricks cannot be cut to the required shape to form cut (maru) corners, cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) equal to thickness of course shall be provided in lieu of cut bricks.

6.2.4.7 Bricks shall be laid with frog (where provided) up. However, when top course is exposed, bricks shall be laid with frog down. For the bricks to be laid with frog down, the frog shall be filled with mortar before placing the brick in position.

6.2.4.8 In case of walls one brick thick and under, one face shall be kept even and in proper plane, while the other face may be slightly rough. In case of walls more than one brick thick, both the faces shall be kept even and in proper plane.

6.2.4.9 To facilitate taking service lines later without excessive cutting of completed work, sleeves (to be paid separately) shall be provided, where specified, while raising the brick work. Such sleeves in external walls shall be sloped down outward so as to avoid passage of water inside.

6.2.4.10 Top of the brickwork in coping and sills in external walls shall be slightly tilted. Where brick coping and sills are projecting beyond the face of the wall, drip course/throating (to be paid separately) shall be provided where indicated.

6.2.4.11 Care shall be taken during construction that edges of jambs, sills and projections are not damaged in case of rain. New built work shall be covered with gunny bags or tarpoulin so as to prevent the mortar from being washed away. Damage, if any, shall be made good to the satisfaction of the Engineer-in-Charge.

6.2.4.12 Vertical reinforcement in the form of bars (MS or high strength deformed bars or thermo-mechanically treated bars as per direction of Engineer-in-Charge), considered necessary at the corners and junction of walls and jamb opening doors, windows etc. shall be encased with cement mortar not leaner than 1:4 (1 cement : 4 coarse

sand), or cement concrete mix as specified. The reinforcement shall be suitably tied, properly embedded in the foundation and at roof level. The dia. of bars shall not be less than 8 mm and concrete grade shall be minimum 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size).

6.2.4.13 In retaining walls and the like, where water is likely to accumulate, weep holes, 50 to 75 mm square shall be provided at 2 m vertically and horizontally unless otherwise specified. The lowest weep hole shall be about 30 cm above the ground level. All weep holes shall be surrounded by loose stones and shall have sufficient fall to drain out the water quickly.

Note : Work of providing loose stone will be payable extra.

6.2.4.14 Work of cutting chases, wherever required to be made in the walls for housing G.I. pipe, CI pipe or any other fixtures shall be carried out in various locations as per guidelines given below :

(a) Cutting of chases in one brick thick and above load bearing walls.

- (i) As far as possible services should be planned with the help of vertical chases. Horizontal chases should be avoided.
- (ii) The depths of vertical chases and horizontal chases shall not exceed one-third and one-sixth of the thickness of the masonry respectively.
- (iii) When narrow stretches of masonry (or short length of walls) such as between doors and windows, cannot be avoided they should not be pierced with openings for soil pipes or waste pipes or timber joints, etc. Where there is a possibility of load concentration such narrow lengths of walls shall be checked for stresses and high strength bricks in mortar or concrete walls provided, if required.
- (iv) Horizontal chases when unavoidable should be located in the upper or lower one-third of height of storey and not more than three chases should be permitted in any stretch of a wall. No continuous horizontal chase shall exceed one metre in length. Where unavoidable, stresses in the affected area should be checked and kept within the permissible limits.
- (v) Vertical chases should not be closer than 2 m in any stretch of a wall. These shall be kept away from bearings of beams and lintels. If unavoidable, stresses in the affected area should be checked and kept within permissible limits.
- (vi) Masonry directly above a recess, if wider than 30 cm horizontal dimension) should be supported on lintel. Holes in masonry may be provided upto 30 cm width and 30 cm height without any lintel. In the case of circular holes in the masonry, no lintel need be provided for holes upto 40cm in diameter.

(b) Cutting of chases in half brick load bearing walls.

No chase shall be permitted in half brick load bearing walls and as such no recessed conduits and concealed pipes shall be provided with half brick thick load bearing walls.

(c) Cutting of chases in half brick non-load bearing wall :

Services should be planned with the help of vertical chases. Horizontal chase should be provided only when unavoidable.

6.2.6 Curing: The brick work shall be constantly kept moist on all faces for a minimum period of seven days. Brick work done during the day shall be suitably marked indicating the date on which the work is done so as to keep a watch on the curing period.

6.2.7 Scaffolding: Scaffolding shall be strong to withstand all dead, live and impact loads which are likely to come on them.

Scaffolding shall be provided to allow easy approach to every part of the work.

6.2.7.1 Single Scaffolding: Where plastering, pointing or any other finishing has been indicated for brick work, single scaffolding may be provided, unless otherwise specified. In single scaffolding, one end of the put-logs/pole shall rest in the hole provided in the header course of brick masonry. Not more than one header for each put-log/pole shall be left out. Such holes shall not be allowed in the case of pillars, brick work less than one metre in length between the openings or near the skew backs of arches or immediately under or near the structural member supported by the walls. The holes for putlogs/poles shall be made good with brick work and wall finishing as specified.

6.2.7.2 Double Scaffolding: Where the brick work or tile work is to be exposed and not to be finished with plastering etc. double scaffolding having two independent supports, clear of the work, shall be provided.

11.0 FLOORING

11.1 CEMENT CONCRETE FLOORING

11.1.1 Cement Concrete: Cement concrete of specified mix grade shall be used and it shall generally conform to the specifications described under sub head 4.0 .

11.1.2 Base Concrete

11.1.2.1 Flooring shall be laid on base concrete where so provided. The base concrete shall be provided with the slopes required for the flooring. Flooring in verandah, Courtyard, kitchens & baths shall have slope ranging from 1 : 48 to 1 : 60 depending upon location and as decided by the Engineer-in- Charge. Floors in water closet portion shall have slope of 1:30 or as decided by the Engineer -in- Charge to drain off washing water. Further, necessary drop in flooring in bath, WC, kitchen near floor traps ranging from 6 mm to 10 mm will also be provided to avoid spread of water. Necessary margin to accommodate this drop shall be made in base concrete. Plinth masonry off set shall be depressed so as to allow the base concrete to rest on it.

11.1.2.2 The flooring shall be commenced preferably within 48 hours of the laying of base concrete. The surface of the base shall be roughened with steel wire brushes without disturbing the concrete. Immediately before laying the flooring, the base shall be wetted and a coat of cement slurry @ 2 kg of cement spread over an area of one sqm so as to get a good bond between the base and concrete floor.

11.1.2.3 If the cement concrete flooring is to be laid directly on the RCC slab, the top surface of RCC slab shall be cleaned and the laitance shall be removed and a coat of cement slurry @ 2 kg of cement spread over an area of one sqm so as to get a good bond between the base and concrete floor.

11.1.3 Thickness: The thickness of floor shall be as specified in the description of the item.

11.1.4 Laying

11.1.4.1 Panels: Flooring of specified thickness shall be laid in the pattern including the border as given in the drawings or as directed by the Engineer-in-Charge. The border panels shall not exceed 450 mm in width and the joints in the border shall be in line with panel joints. The panels shall be of uniform size and no dimension of a panel shall exceed 2 m and the area of a panel shall not be more than 2 sqm. The joints of borders at corners shall be mitred for provision of strips.

11.1.4.2 Laying of Flooring with Strips: Normally cement concrete flooring shall be laid in one operation using glass/aluminium/PVC/brass strips/stainless steel strips or any other strips as required as per drawing or instructions of the Engineer-in-Charge, at the junction of two panels. This method ensures uniformity in colour of all the panels and straightness at the junction of the panels. 4 mm thick glass strips or 2 mm PVC strips or 2 mm aluminium or brass strips shall be fixed with their tops at proper level, giving required slopes. Use of glass and metallic strips shall be avoided in areas exposed to sun. Cost of providing and fixing strips shall be paid for separately.

Concreting: Cement concrete shall be placed in the panels and be levelled with the help of straight edge and trowel and beaten with trowel or mason's trowel. The blows shall be fairly heavy in the beginning but as consolidation takes place, light rapid strokes shall be given. Beating shall cease as soon as the surface is found covered with a thin layer of cream of mortar. The evenness of the surface shall be tested with straight edge. Surface of flooring be true to required slopes. While laying concrete, care shall be taken to see that the strips are not damaged/disturbed by the labourers. The tops of strips shall be visible clearly after finishing with cement slurry.

11.1.4.3 Laying of Flooring without Strips: Laying of cement concrete flooring in alternate panels may be allowed by the Engineer-in-Charge in case strips are not to be provided.

Shuttering: The panels shall be bounded by angle iron or flats. The angle iron/flat shall have the same depth as the concrete flooring. These shall be fixed in position, with their top at proper level giving required slopes. The surface of the angle iron or flats, to come in contact with concrete shall be smeared with soap solution or non-sticking oil (Form oil or raw linseed oil) before concreting. The flooring shall butt against the unplastered masonry wall.

Concreting: The concreting shall be done in the manner described under 11.2.4.2. The angle iron/ flats used for shuttering, shall be removed on the next day of the laying of cement concrete. The ends thus exposed shall be repaired, if damaged with cement mortar 1 : 2 (1 cement : 2 coarse sand) and allowed to set for minimum period of 24 hours. The alternate panels shall then be cleaned of dust, mortar, droppings etc. and concrete laid. While laying concrete, care shall be taken to see that the edges of the previously laid panels are not damaged and fresh mortar is not splashed over them. The joints between the panels should come out as fine straight lines.

11.1.5 Finishing

11.1.5.1 The finishing of the surface shall follow immediately after the cessation of beating. The surface shall be left for some time, till moisture disappears from it or surplus water can be mopped up. Use of dry cement or cement and sand mixture stiffening the concrete to absorb excessive moisture shall not be permitted. Excessive trowelling shall be avoided.

11.1.5.2 Fresh cement shall be mixed with water to form a thick slurry and spreaded @ 2 kg of cement over an area of one sqm of flooring while the flooring concrete is still green. The cement slurry shall then be properly processed and finished smooth.

11.1.5.3 The edges of sunk floors shall be finished and rounded with cement mortar 1:2 (1 cement : 2 coarse sand) and finished with a floating coat of neat cement.

11.1.5.4 The junctions of floor with wall plaster, dado or skirting shall be rounded off where so specified.

11.1.5.5 The men engaged on finishing operations shall be provided with raised wooden platform to sit on so as to prevent damage to new work.

11.1.6 Curing: The curing shall be done for a minimum period of ten days. Curing shall not be commenced until the top layer has hardened. Covering with empty gunnies bag shall be avoided as the colour of the flooring is likely to be bleached due to the remnants of cement dust from the bags.

11.15 PRESSED CERAMIC TILE FLOORING

8.0 MARBLEWORK

8.0 GENERAL: Marble shall be hard, sound, dense and homogeneous in texture with crystalline texture as far as possible. It shall generally be uniform in colour and free from stains, cracks, decay and weathering.

8.0.1 Marbles are metamorphic rocks capable of taking polish, formed from the re-crystallization of lime stones or dolomitic lime stones and are distinguished from lime stone by even visibly crystalline nature and nonflaggy stratification.

8.1 CLASSIFICATION: The marble blocks, slabs and tiles shall be classified broadly in the following two categories:

8.1.1 White Marble: *Raj Nagar (plain white) Marble:* It shall be plain white marble with coarse grains predominantly showing mica particles giving reflection in light

8.1.3 Granite Stone: It shall be of any colour and size as directed by Engineer-in -Charge. Granite shall be plain machine cut and mirror polished. The stone shall be smooth and of even surface without holes or pits.

8.5 MARBLE WORK - TABLE RUBBED AND POLISHED (PLAIN WORK)

Marble work in steps, jambs, columns and other plain work shall be as specified below:

Joints in staircase treads, kitchen platforms shall be permitted only at curvature or when width/ length is more than 0.6/2 mtrs. respectively. Number of joints in each direction shall not be more than one number for every 2 mtrs. length beyond the initial 2.00 m length.

Mortar: The mortar used for jointing shall be as specified.

8.5.2 Laying: All marble stones shall be wetted before placing in position. These shall then be floated on mortar and bedded properly in position with wooden mallets without the use of chips or under pinning of any sort.

The walls and pillars shall be carried up truly in plumb or battered as shown in the drawings. All courses shall be laid truly horizontal and all vertical joints shall be truly vertical.

In case of work without backing of brick work or coursed rubble masonry, face stone shall be laid in headers and stretchers alternatively unless otherwise directed. The headers shall be arranged to come as nearly as possible in the middle of stretchers above and below. Stone shall be laid in regular courses of not less than 15 cm in height and all courses shall be of the same height unless otherwise specified.

For work facing with backing of brick work or coursed rubble masonry, face stone shall be laid in alternate courses of header and stretchers unless otherwise directed. Face stone and bond stone courses shall have break joint on the face of at least half the height of the standard course and the bond shall be carefully maintained through out. All the connected masonry in a structure shall be carried up nearly at one uniform level throughout but where breaks are unavoidable the joints shall be made in good long steps so as to prevent cracks developing between new and old work.

When necessary jib crane or other mechanical appliances shall be used to hoist the heavy pieces of

stones and place these in to correct positions, care being taken that the corners of the stone are not damaged. Stone shall be covered with gunny bags, before putting chain or rope is passed over it, and it shall be handled carefully. No piece which has been damaged shall be used in work. The matching of grains shall be carried out as directed by the Engineer-in-Charge.

8.5.3 Bond Stone: Bond or through stones running right through the thickness of walls, shall be provided in walls upto 60 cm thick and in case of wall above 60 cm thickness a set of two or more bond stones overlapping each other by atleast 15 cm shall be provided in a line from face to back.

At least one bond stone or a set of bond stones shall be provided for every 0.5 sqm of the wall surface. All bond stones shall be marked suitably as directed by the Engineer-in-Charge.

8.5.4 Joints: The depth of joints 6 mm from the face shall be uniform and as fine as possible but shall be not more than 1.5 mm thick on the exposed face. Beyond the depth of 6 mm from face, the thickness of joints shall increase in an inverted V shape so as to give good mortar bond between two stones. The inverted portion of the joints shall be filled with bedding mortar and the face 6 mm portion with pointing mortar.

8.5.5 Curing: The work shall be kept constantly moist on all faces for a period of atleast seven days.

8.5.6 Finishing: After the marble work is cured, it shall be rubbed with carborandum stone of different grades no. 60, 120 and 320 in succession or with electrical rubbing machines rubbed with carborandum items 0 to 6 nos.in succession, so as to give a plane true and highly smooth surface. It shall then be cleaned with a solution of oxalic acid, washed and finished clean.

12.0 ROOFING

12.2 RIDGES AND HIPS OF PLAIN GALVANISED STEEL SHEETS

12.2.1 Ridges and Hips: Ridges and hips of C.G.S. roof shall be covered with ridge and hip sections of plain G.S. sheet with a minimum lap of 20 cm on either side over the C.G.S. sheets. The end laps of the ridges and hips and between ridges and hips shall also be not less than 20 cm. The ridges and hips shall be of 60 cm overall width plain G.S. sheet, 0.6 mm or 0.8 mm thick as given in the description of the item and shall be properly bent in shape.

12.2.2 Fixing

12.2.2.1 Ridges shall be fixed to the purlins below with the same 8 mm dia G.I. hook bolts and nuts and bitumen and G.I. limpet washers which fix the sheets to the purlins.

12.2.2.2 Similarly, hips shall be fixed to the roof members below such as purlins, hip and valley rafters with the same 8 mm dia G.I. hook bolts and nuts and bitumen and G.I. limpet washers which fix the sheets to those roof members. At least one of the fixing bolts shall pass through the end laps of ridges and hips, on either side. If this is not possible extra hook bolts shall be provided.

12.2.2.3 The end laps of ridges and hips shall be joined together with C.G.S sheet by galvanised iron seam bolts 25 x 6 mm size each with a bitumen and G.I. washer or white lead as directed by the Engineer-in-Charge. There shall be at least two such bolts in each end lap.

12.2.2.4 Surface of C.G.I. sheets of ridge and hip sections and the roofing sheets which overlap each other shall be painted with a coat of approved primer and two coats of approved paint suitable for painting G.S. Sheets before they are fixed in place.

12.2.3 Finish: The edges of the ridges and hips shall be straight from end to end and their surfaces should be plane and parallel to the general plane of the roof. The ridges and hips shall fit in squarely on the sheets.

Specifications for Environmental, Social, Health and Safety Management (ESHS) of the Works

1. Essential ESHS issues of worksite management

The ESHS topics identified during the Environmental and Social Impact Assessment study of the project, which present a major risk for the work sites management are:

a) ESHS resources and facilities and ESHS monitoring organization	NO
b) Project Areas management (base camps, quarries, borrow pits, storage areas)	NO
c) Health & Safety on worksites	YES
d) Local recruitment and ESHS trainings of local staff (capacity building), ESHS trainings of subcontractors and local partners (transfer of knowledge)	NO
e) Relations with stakeholders, information and consultation of local communities and authorities	NO
f) Traffic management	NO
g) Hazardous products	NO
h) Wastewater (effluents)	NO
i) Protection of water resources	YES
j) Atmospheric emissions, noise and vibrations	NO
k) Waste management	NO
l) Biodiversity: protection of fauna and flora	YES
m) Site rehabilitation and revegetation	YES
n) Erosion and sedimentation	NO
o) Control of infectious and communicable diseases (HIV/AIDS, malaria...)	NO

2. ESHS requirements not applicable under this Contract

<p>The ESHS norms, standards and discharge limit values recommended by the specialized international organizations affiliated to the United Nations shall apply to the Contract:</p> <p style="text-align: center;">Yes <input type="checkbox"/> / No <input checked="" type="checkbox"/></p>
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The following Clauses of the ESHS Specifications shall not apply to this Contract and shall not be priced by the Bidder under the specific ESHS Cost Schedule:

Number of the non-applicable Clause	Description
Clause 1 [Responsibilities and Liabilities] Sub-clause 1.3 c)	Sub-Clause 1.3 a), b), d), e) and d) remain applicable.
Clause 2 [ESHS Planning Document] Sub-Clause 2.1.3	1st sentence of the clause 2.1.3 (<i>The Contractor defines in the Worksite - ESMP the number, the locations and the type of Project Area as defined in Sub-Clause 1.3 of the ESHS Specifications.</i>) remains applicable.
Clause 4 [Resources allocated to environmental management] Sub-Clause 4.1.4	1st sentence of the clause 4.1.4 (<i>The ESHS Manager speaks fluently the language of communication of the Contract, and the official language of the Employer's country, if the language of communication of the Contract is not the official language.</i>) remains applicable. The qualification of the ESHS Manager shall be as per the requirement for the Health & Safety Officer mentioned in Section III - Evaluation and Qualification Criteria.
Clause 6 [Reporting] Sub-Clause 6.3.6 and Clause 6.3.7, Sub-Clause a), c), d) and f)	Sub-clause 6.3.7 b), e) and g) remain applicable
Clause 9 [Standards] Sub-Clause 9.2 and 9.3	Sub-Clause 9.1 remains applicable: The Contractor shall be required to comply with

Number of the non-applicable Clause	Description
	applicable norms, standards, and discharge limit values according to the regulations of the country where the work is performed.
Clause 12 [Effluents]	
Clause 13 [Atmospheric emissions and dust]	
Clause 14 [Noise and vibrations]	
Clause 15 [Waste]	
Clause 18 [Erosion and sediment transport]	

Throughout the present ESHS Specifications (hereinafter called "**the ESHS Specifications**"), a reference to Conditions of Contract, abbreviated by CC, means a reference to both the General Conditions of Contract and the Particular Conditions of Contract. Readers should apply due care, when being referred to a specific Clause or Sub-Clause, to:

- Read first the Clause or Sub-Clause text from the General Conditions of Contract;
- Then check whether this text has been amended by the Particular Conditions of Contract, and if so, to which extent.

As per CC Sub-Clause 1.5 – Priority of Documents, when interpreting the Contract, the terms of the Particular Conditions of Contract prevail over those found in the General Conditions of Contract.

Any term in these ESHS Specifications which is identical to a term in the Conditions of Contract shall have the same meaning as the one defined in the Conditions of Contract.

Any term in capital letters in these ESHS Specifications is defined in CC Sub-Clause 1.1 – Definitions.

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A. Environmental, Social, Health and Safety Management System

1 Responsibilities and Liabilities

- 1.1 In conjunction with his obligations defined under the Contract, the Contractor will plan, execute and document construction works pursuant to the Environment, Social, Health and Safety (ESHS) Specifications.
- 1.2 The Contractor is liable for all damages to natural resources caused by the execution of the Works or the methods used for execution, unless it is established that the execution or methods were necessary, according to the provisions of the Contract or an Engineer’s instruction.
- 1.3 Under the Contract and as introduced by the ESHS Specifications, the term "Project Area" means:
 - a) The land where work will be carried out; or
 - b) The land necessary for the implantation of construction facilities (work camp, workshops, offices, storage areas, concrete production plants) and including special access roads; or
 - c) Quarries for aggregates, rock material and riprap; or
 - d) Borrow areas for sand and other selected material; or
 - e) Stockpiling areas for backfill material or other demolition rubble; or
 - f) Any other location, specifically designated in the Contract as a Project Area.

The term "Project Area" encompasses any individual Project Area or all Project Areas.

For the sake of clarity, Project Area is a different concept than Site under CC Sub-Clause 1.1.6.7.

Project Area defines an area within which the Contractor is to comply with environmental, social, health and safety obligations defined in the ESHS Specifications.

Site is the places where the Permanent Works are to be executed and to which Plant and Materials are to be delivered, and where right of access to, and possession of, is to be given by the Employer to the Contractor. The Employer is under no similar obligation for any area located outside the Site, even if within the Project Area, where access is at Contractor’s risk.

In term of physical footprint, the CC Sub-Clause 1.1.6.7 Site is included in the Project Area. The Project Area is then of greater geographical extent than the Site.

- 1.4 The ESHS Specifications refer to the entire area of influence for the Works:
 - a) Protection of the natural environment (water, air, soil, vegetation, biological diversity) in areas within any Project Area and its surroundings, i.e. including but not limited to access roads, quarries, borrow areas, stockpiling of backfill material, camps or storage areas;
 - b) Health and safety conditions to be maintained for the Contractor’s personnel and any other person present on the Project Areas, or along access routes;
 - c) Working practices and the protection of people and populations living near the Project Area, but exposed to the general disturbance caused by works.

1.5 Subcontractors:

The ESHS Specifications apply to the Contractor and unless explicitly agreed with the Engineer, all Subcontractors used for the execution of the Works. Pursuant to Sub-Clause 4.4 of the CC, the Contractor is fully liable for all actions, non-compliance and negligence by Subcontractors, their representatives, employees and workers, to the same degree as it would be held liable for its own actions, non-compliance or negligence or that of its own representatives, employees or workers.

- 1.6 Applicable regulations:
The Contractor must identify all regulations in relation to the protection of the environment (water, air, soils, noise, vegetation, fauna, flora, waste, groundwater) and, pursuant to Clauses 4 and 6 of the CC, the protection of people (labour law, indigenous populations, standards on occupational exposure, other). The Contractor must list all texts, standards and other regulatory limitations in its Worksite Environmental and Social Management Plan (Worksite - ESMP as specified in Sub-Clause 2.1 of the ESHS Specifications) and specify the means taken for compliance.
- 2 ESHS Planning Document**
- 2.1 Worksite Environmental and Social Management Plan (Worksite - ESMP)
- 2.1.1 The Contractor prepares and ensures prior validation by the Engineer, implementation and regular update of a Worksite Area Environmental and Social Management Plan (Worksite - ESMP).
- 2.1.2 The Worksite - ESMP represents the unique reference document in which the Contractor defines in detail all organizational and technical provisions implemented to satisfy the obligations of the ESHS Specifications.
- 2.1.3 The Contractor defines in the Worksite - ESMP the number, the locations and the type of Project Area as defined in Sub-Clause 1.3 of the ESHS Specifications. For each of the identified Project Area, unless otherwise agreed by the Engineer, the Contractor establishes an Environmental Protection Plan (EPP). The EPP(s) are annexed to the Worksite - ESMP.
- 2.1.4 The Worksite - ESMP covers the entire period from the Contract Agreement signature date to the date of issue of the Performance Certificate by the Engineer.
- 2.1.5 Unless agreed otherwise by the Engineer, the Worksite - ESMP is written in the language of communication defined under Sub-Clause 1.4 of the CC.
- 2.1.6 The first draft version of the Worksite - ESMP is to be provided by the Contractor to the Engineer within 28 days from the date of execution of the Contract Agreement.
- 2.1.7 No physical work or activity shall commence on any Project Area until such time the Worksite - ESMP, and the annexed EPP corresponding to the Project Area, are approved by the Engineer.
- 2.1.8 During the execution of the Works, whenever instructed by the Engineer, the Worksite - ESMP will be updated by the Contractor and reissued to the Engineer. The revised version shall highlight the new elements incorporated in the document.
- 2.1.9 The Worksite - ESMP (and the EPP) is structured according to the plan specified in Appendix 1 to the ESHS Specifications.
- 3 Management of non-conformities**
- 3.1 In application of Clause 5, non-conformities detected during inspections carried out by the Contractor or Engineer are subject to a process adapted to the severity of the situation. The non-conformities will be defined as deviations from the requirements of the applicable regulations, the ESHS Specifications, the ESMP, and the Worksite - ESMP. Non-conformities are divided into 4 categories as follows:
- 3.1.1 Notification of observation of minor non-conformities. The non-conformity results in a notification to the Contractor's Representative, followed-up by a signed notification of observation prepared by the Engineer. The multiplication of notifications of observation at the Project Area, or absence of corrective actions by the Contractor, can result in the severity of the non-conformity being raised to that of level 1.
- 3.1.2 Level 1 non-conformity: Non-conformities that present a moderate and non-immediate risk for health, environment, social or safety. The non-conformity is identified in writing to the Contractor and shall be resolved within five (5) days. The Contractor addresses to the Engineer

the proof explaining how the non-conformity has been corrected. Further to an inspection and a favourable evaluation of effectiveness of the corrective action, the Engineer validates in writing the close-out for the non-conformity. In all cases where a non-conformity of level 1 is not resolved within one (1) month, the severity of the non-conformity is raised to level 2.

3.1.3 Level 2 non-conformities: applies to all non-conformities that represent a moderate and immediate risk or with significant consequences to health and/or the environment, social or safety. The same procedure as for level 1 non-conformities is applied. Corrective action shall be taken by the Contractor within three (3) days. All level 2 non-conformities which are not resolved within one (1) month, are raised to level 3.

3.1.4 Level 3 non-conformities: applies to all non-conformities that have resulted in damage to health or the environment, or which represent a high risk for health, safety, environmental or social hazards. The highest levels of the Contractor's and Engineer's hierarchies present in the Employer's country are informed immediately and the Contractor has twenty-four (24) hours to bring the situation under control. Pursuant to Clause 14.7 of the CC, a level 3 non-conformity results in the suspension of interim payments until the non-conformity has been resolved. If the situation requires, and in pursuance to Clause 8.8 of the PC, the Engineer can order the suspension of work until the resolution of the non-conformity.

4 Resources allocated to environmental management

4.1 ESHS supervisors and Manager:

4.1.1 Pursuant to Sub-Clause 4.18 of the CC and in addition to the provisions of Sub-Clause 6.7 of the CC, the Contractor appoints one (or two depending on the case) Environment, Social, Health and Safety Manager(s) in charge of implementing the ESHS Specifications. Several experts may be assigned to fulfill this position. The manager(s) will be the Key ESHS Personnel identified in the bidding process, if any.

4.1.2 The ESHS Manager is permanently based at the Project Area for the full duration of the Works as of Contractor's mobilization until Taking-Over Certificate is issued.

4.1.3 This manager holds the power within the Contractor's organization to be able to suspend the Works if considered necessary in the event of level 2 or 3 non-conformities, and allocate all resources, personnel and equipment required to take any corrective action considered necessary.

4.1.4 The ESHS Manager speaks fluently the language of communication of the Contract, and the official language of the Employer's country, if the language of communication of the Contract is not the official language. The ESHS Manager will hold a relevant University degree or a significant experience of at least five (5) years in designing and monitoring the implementation of an environmental and social management plan for construction works.

4.1.5 ESHS supervisors are appointed in sufficient numbers and represent the ESHS Manager within work teams. Their role is to ensure that the Works are carried out pursuant to the ESHS Specifications and notify the ESHS Manager of any detected non-conformities.

4.2 Person in charge of relations with external stakeholders:

4.2.1 The Contractor appoints a person responsible for relations with external stakeholders: local communities, administrative authorities, religious and other representatives. If necessary, a team will be created.

4.2.2 Administrations and local authorities will be informed of the existence of this person as of the start of works and will be provided with contact details so as to be able to contact this person if a problem arises during the execution of works, or concerning the behaviour of the Contractor's

Personnel, inside or outside the Project Area.

4.3 The team, including the ESHS supervisors and manager, and the person in charge of relations with external stakeholders, will be allocated the necessary resources to operate independently (travel, office equipment and communication).

5 Inspections

5.1 In addition to the ESHS Manager's own inspections, an ESHS inspection will be carried out on the facilities and Project Area on a weekly basis jointly with the Engineer.

5.2 A written report will be drafted for each weekly inspection, in a format approved by the Engineer, addressing non-conformities detected on the Project Area as specified in the ESHS Specifications.

5.3 Each non-conformity will be documented by a digital photograph with captions to provide a visual illustration, explicitly indicating the location, date of inspection and the non-conformity in question.

6 Reporting

6.1 As part of the Progress Report specified in Sub-Clause 4.21 of the CC, the Contractor submits an ESHS activity report summarizing all ESHS initiatives implemented in relation to the execution of the Works during the reporting period to the Engineer on a monthly basis. The activity report is a separate document from the update of the Worksite - ESMP, which is updated at the intervals indicated in Sub-Clause 2.1.8 of the ESHS Specifications.

6.2 The ESHS activity report is written exclusively in the language of communication defined under Sub-Clause 1.4 of the CC.

6.3 Pursuant to Sub-Clause 4.21 of the CC, the ESHS activity report is submitted at the latest 7 working days after the last day of the month in question. The report contains the following information.

6.3.1 List of ESHS personnel present at the Site at the end of the month.

6.3.2 Construction works activities conducted during the month.

6.3.3 Inspections carried out (location and intervals).

6.3.4 Non-conformities detected during the month with descriptions of the root cause analysis and corrective actions taken.

6.3.5 Description of actions conducted and measures taken during the month to remedy non-conformities and to manage environmental, social, health and safety risks and impacts.

6.3.6 Description of stakeholder engagement activities undertaken with neighbouring populations, local authorities, governmental agencies.

6.3.7 Monitoring results for the following indicators:

a) Effluent quality (Sub-Clause 12.5 of the ESHS Specifications), if applicable;

b) Drinking-water quality, if applicable;

c) Hazardous and non-hazardous waste generation;

d) Air and noise emissions, if applicable;

e) Project Area state (Sub-Clause 20 of the ESHS Specifications);

f) Recruitment, number of positions and hours worked by local Contractor's Personnel (Sub-Clause 39.3 of the ESHS Specifications);

g) Health & safety statistics: in pursuance to Clauses 4 and 6 of the CC, number of fatal accidents, lost-time accidents, number of accidents without lost-time, serious illness, frequency of accidents, and serious misconduct by Contractor's Personnel (record sheet attached as an appendix to the activity report, pursuant to Sub-Clause 7.7 of the ESHS Specifications); including root cause analysis and corrective actions taken.

6.3.8 Where appropriate, description of the formal or informal complaints (negative media attention, strikes or labour disputes, protests, complaints from communities, NGO or workers or formal notice from

authorities, etc.) related to environmental, social, health and safety risks and impacts of the Works; including root cause analysis and corrective actions taken.

6.3.9 Report on training activities (topic, number and duration of sessions, number of participants).

6.3.10 Provisional environmental, social, health and safety actions for the coming months.

6.4 Notification of ESHS events:

6.4.1 The Engineer is informed within one hour of any accident,(i) involving serious bodily injury to a member of personnel, a visitor or any other third party, caused by the execution of the Works or the behaviour of the personnel of the Contractor, or (ii) any significant damage to private property, or (iii) any significant damage to the environment.

6.4.2 The Engineer is informed as soon as possible of any near-accident relating to the execution of the Works which, in slightly different conditions, could have led to bodily injury to people, or damage to private property or the environment.

7 Rules of Procedure

7.1 Rules of procedure are established by the Contractor for the Project Areas, addressing the following: safety rules, zero tolerance for substance abuse (refer to Clause 37), environmental sensitivity of areas around the Project Areas, the dangers of STDs with HIV/AIDS, gender issues (in particular sexual harassment) and respect for the beliefs and customs of the populations and community relations in general (drawing special attention to the risks of prostitution and human trafficking).

7.2 The rules are clearly displayed at the different Project Areas.

7.3 The rules confirm the Contractor's commitment to implementing the ESHS provisions provided for in the Contract.

7.4 New Contractor's Personnel and existing Contractor's Personnel are made aware and acknowledge their understanding of the rules of procedure and the associated provisions. Rules of procedure document are initialed by all Contractor's Personnel prior to the start of any physical work at any Project Area.

7.5 Pursuant to Clauses 6.9 and 6.11 of the CC, the rules of procedure include a list of acts considered as serious misconduct and which must result in dismissal from any Project Area by the Contractor, or by the Engineer if the Contractor is not acting in due course, should a Contractor's Personnel repeatedly commit an offence of serious misconduct despite awareness of the rules of procedure, and this is without prejudice to any legal action by any public authority for non-compliance with applicable regulations:

- a) Drunkenness during working hours;
- b) Drug use;
- c) Punishable statements or attitudes, and sexual and mental harassment in particular;
- d) Violent behaviour;
- e) Intentional damage to the assets and interests of others, or the environment;
- f) Repeated negligence or imprudence leading to damage or prejudice to the environment, the population or properties, particularly breaching provisions intended to prevent the spreading of STD with HIV/AIDS;
- g) Possession and/or consumption of meat or any other part of an endangered animal or plant as defined in the Washington convention (CITES) and national regulations.

7.6 Serious misconduct, such as organization of sex trade (pimping), committing pedophilia, rape, physical aggression, drug trafficking, deliberate and severe pollution, trading and/or trafficking in all or part of protected species, shall lead to immediate dismissal as of the first report of misconduct is detected,

in application of the rules of procedure and labour laws.

7.7 The Contractor establishes a record for each case of serious misconduct, and a copy will be provided to the Contractor's Personnel in question, indicating all action taken to terminate the misconduct by the Contractor's Personnel in question and to bring the attention of other Contractor's Personnel to the type of incident detected. This record will be provided to the Engineer as an attachment to the ESHS activity report (see Sub-Clause 6.3 of the ESHS Specifications).

8 ESHS Training

8.1 The Contractor prepares a training and capacity building program for its Contractor's Personnel, as described in the Worksite - ESMP and documented each month in the ESHS activity report.

8.2 The Contractor also details in the training program the actions and ESHS training for Subcontractors and other members of the joint venture when applicable.

8.3 Training sessions are two-fold: introductory sessions for starting work at the Project Area, and technical training as required in relation to the execution of the Works.

8.3.1 Starting work sessions are organized for each Contractor's Personnel and shall cover as a minimum:

- a) Rules of procedure;
- b) Safety rules on Project Areas;
- c) Protection of areas adjacent to Project Area;
- d) Risks relating to sexually transmitted diseases (Sub-Clause 6.7 of the CC), prostitution, human trafficking, and sexual harassment;
- e) Basic health: combating malaria (if prevalent) and waterborne diseases, improving hygiene;
- f) Emergency response procedures or evacuation.

8.3.2 Technical training:

- a) Training in the skills needed for tasks requiring a work permit (Clause 24 of the ESHS Specifications);
- b) Training in first aid and transporting the injured in order to achieve the targets defined in Sub-Clause 29.1 of the ESHS Specifications on the number of first aid officers per Project Area and per team;
- c) Ability to drive on rough ground.

8.4 The Contractor prepares an awareness program, where applicable, for local communities adapted to the main risks relating to the Works. This program will be included in the training program described in Sub-Clause 8.1 of the ESHS Specifications.

9 Standards

9.1 The Contractor complies with all norms, standards and discharge limit values defined in the national regulations of the Employer's country regulations and pursuant to Sub-Clause 1.6 of the ESHS Specifications.

9.2 The Contractor comply with norms, standards and discharge limit values recommended by the specialized international organizations affiliated to the United Nations, as described in Sub-Clause 9.3 below of the ESHS Specifications. In the event of discrepancies in between international standards and national regulations, the Contractor shall comply with the most stringent requirements.

9.3 The specialized international organizations affiliated to the United Nations referred to in Sub-Clause 9.2 of the ESHS Specifications include:

- World Bank, including the IFC and its Environmental, Health and Safety guidelines available from <http://www.ifc.org/ehsguidelines>.

For matters not addressed in the IFC above document, the most stringent of the norms, standards and discharge limit values of the following institutions shall apply:

- World Health Organization (WHO);
- International Labour Organization (ILO) (in particular in pursuance to Sub-Clauses 6.20, 6.21, 6.23 and 6.24 of the CC);
- International Maritime Organization (IMO).

B. Protection of the Environment

10 Protection of adjacent areas

- 10.1 Pursuant to Sub-Clause 4.18 of the CC, and unless instructed otherwise by the Engineer, the Contractor uses construction methods and means of protection in order to avoid or minimize adverse effects that are incurred on vegetation, soils, groundwater and surface water, biodiversity, natural drainage and the water quality in areas within any Project Area and its surroundings for the entire duration of the Works.
- 10.2 Wetland areas include marshes, fens, mires or natural or artificial bodies of water, whether permanent or temporary, where water is stagnant or flowing, fresh, saline or briny, including seawater with a low-tide depth of six metres or less. Filling of all or part of a wetland area is not permitted, unless the Works are necessary according to the provisions of the Contract or the instructions of the Engineer.
- 10.3 With the exception of access roads, or unless instructed otherwise by the Engineer, the entire perimeter of land sites with a surface area of less than 2 hectares is physically demarcated with a fence or tape. For Project Area with a surface area of more than 2 hectares, the perimeter will be physically demarcated by a perimeter track, road, signs or any other means leaving no possible ambiguity as to the location of the Project Area perimeter.
- 10.4 Unless instructed otherwise by the Engineer, the Contractor defines the perimeter of the Project Area at a distance of at least:
- a) 50 m from any permanent water course and outside of floodable areas;
 - b) 300 m from sensitive urban services and buildings (health centre, school centres, water supply for populations);
 - c) 200 m from any housing; and
 - d) 300 m from housing in the specific case of work requiring the use of explosives.
- 10.5 If the footprint of the Works do not respect the distances mentioned in the situations a) to d) of Sub-Clause 10.4 above of the ESHS Specifications, and unless agreed upon otherwise by the Engineer, the Contractor will contract a bailiff to make a sworn statement regarding the existence and conditions of residential buildings situated around the Site with a distance specified in paragraph b) to d) of Sub-Clause 10.4 of the ESHS Specifications. The bailiff's sworn statement is prepared and provided to the Engineer with the EPP.

11 Selection of borrow areas, backfill material stockpile sites and access road

- 11.1 The Contractor will submit to the Engineer for prior approval, within the framework of the EPP (provided in Clause 2.1.3), (i) the location of proposed borrow areas or areas to be excavated, (ii) proposed backfill material stockpile locations or zones designated for the rubble from demolition works.
- 11.2 The access routes to the Project Areas will be shown on a map and approved by the Engineer prior to the start of the corresponding Works.

12 Effluents

- 12.1 Effluents consist of liquid discharges, including infiltration, from Project Area, transporting a pollutant (dissolved, colloidal or particles).
- 12.2 A pollutant is a given chemical compound that is at a concentration that is greater than the limit values recognized for that compound according to Clause 9 of the ESHS Specifications.
- 12.3 If no recognized threshold exists pursuant to Sub-Clause 12.2 of the ESHS Specifications, the Contractor provides proof that the charges are harmless.
- 12.4 No effluent is discharged by the Contractor into water courses, soils, lakes or the marine environment without prior treatment and without monitoring of the treatment's performance to guarantee the absence of pollution.
- 12.5 The Contractor carries out or contracts the monitoring of the effluent quality

pursuant to Sub-Clause 12.4 of the ESHS Specifications. In the first case, the Contractor provides the ESHS Manager with the means and skills to carry out in-situ monitoring and laboratory analysis of the performance indicators. In the second case, the Contractor establishes a contract with a specialized contractor, accredited with the Employer's country authorities for this activity.

- 12.6 The physical and chemical parameters of the effluent that are monitored are those that are listed in the applicable regulations according to the provisions of Clause 9 of the ESHS Specifications. The parameters have prior approval from the Engineer.
- 12.7 The Contractor will list, locate, and characterize (flow, expected quality, discharge frequency) all sources of effluents and outlets in the natural environment in the Environment Protection Plan(s).
- 12.8 The Contractor will submit to the Engineer an effluent monitoring report on a monthly basis, including documentation for the following for each effluent discharge point: (i) average flow rates of discharged effluents, (ii) discharge frequencies and durations over the month, and (iii) the physical and chemical quality of the effluent discharged, for the conformity parameters listed in Sub-Clause 12.1 above of the ESHS Specifications.
- 12.9 The special case of rainwater run-off:
 - 12.9.1 Run off consists of the rainwater flow on the surface or the soil and other technical surfaces at Project Areas.
 - 12.9.2 In the context of the Contract, run-off is considered as an effluent and will be treated in accordance with Sub-Clause 12.4 above, unless demonstrated otherwise, as documented and substantiated by the Contractor, and approved by the Engineer.
 - 12.9.3 Particular attention will be given to all platforms with installed generators, hydrocarbon storage tanks, refueling stations and concrete plants (cover, containment, settling, pH neutralization).

13 Atmospheric emissions and dust

- 13.1 Emissions refer to any discharge into the air of solid substances, aerosols, gases, radiation, or energy, whether point sources (e.g. incineration stack) or diffuse (e.g. fugitive dust emissions from road use by trucks).
- 13.2 The Contractor will use equipment and adopt construction and transport methods with atmospheric emissions which are not in excess of the threshold emission values recommended in the applicable regulations according to the provisions of Clause 9 of the ESHS Specifications.
- 13.3 The fleet of vehicles or equipment emitting combustion gases will be maintained at the intervals and according to the methods specified by the manufacturer.
- 13.4 The Contractor will document the maintenance records for its fleet of vehicles, machinery and equipment. The records will be in the language of communication defined under CC Sub-Clause 1.4, or any other language approved by the Engineer, and will be at the disposal of the Engineer.
- 13.5 On unpaved roads used by the vehicles and machinery of the Contractor:
 - 13.5.1 The Contractor takes action to abate fugitive dust emissions generated by vehicles or mobile equipment in residential areas and on roads within the Project Area perimeter.
 - 13.5.2 The Contractor will implement the necessary measures, as described in the Worksite - ESMP, to avoid or limit dust generation: dust removal, regular watering, reduction of Contractor's vehicles speed as specified in Sub-Clause 44.9 of the ESHS Specifications.
- 13.6 When storage, handling and transportation of bulk materials is made in the open air and exposed to the wind, the Contractor implements the necessary dust abatement measures, including one or several of the following techniques: vegetation of the surface, covering of the surface, humidification of the surface, covering the trucks, etc.

14 Noise & vibration

- 14.1 The Contractor uses equipment and adopts construction and transport

methods so not to generate noise levels in excess of values recommended in the applicable regulations according to the provisions of Clause 9 of the ESHS Specifications.

14.2 Except as otherwise provided in the Contract or unless waived by the Engineer, high noise generating works (e.g. pile driving, blasting, rock clearing, drilling, percussion drilling) which may impact occupied receptor areas are carried out during normal working days, but prohibited at night. A receptor area is defined as an area used for nocturnal socioeconomic activities (e.g. accommodation camps, residential areas, hotels, health centres).

14.3 The use of heavy vehicles at night is specified in Sub-Clause 44.9 of the ESHS Specifications.

15 Waste

15.1 The Contractor is responsible for identifying, collecting, transporting and treating all waste produced on the Project Areas by its personnel, Subcontractors and visitors.

15.2 Waste management should be based on the following hierarchy: prevention of waste generations, reuse, recycling and disposal. The Contractor selects suppliers having a voluntary and documented policy to reduce the volume and weight of packaging, and to select recyclable or biodegradable packaging.

15.3 The Contractor establishes and maintains a waste register which is at the disposal of the Engineer. This register will record all waste management operations: production, collection, transport, treatment. The following aspects are documented in this register:

- a) Type of waste, using the nomenclature specified in Sub-Clause 15.7 of the ESHS Specifications;
- b) Waste quantities;
- c) Name and address of the third party waste management facilities receiving waste or parties taking possession of the substances no longer considered as waste;
- d) Name and address of waste transport contractors;
- e) Planned waste treatment.

15.4 The Contractor files and maintains at the disposition of the Engineer the waste manifests for the collection, transport, treatment and/or elimination of waste.

15.5 The waste register is established and available as of the Contractor's mobilization to any Project Area. This register will be archived for at least 1 year after the Taking-Over Certificate for the Works is issued.

15.6 The Contractor implements specific waste management practices adapted to the level of danger for human health or the natural environment. Three waste categories are identified for Project Areas and in tracking documents:

- a) Hazardous waste: any waste with one or several dangerous properties as listed in Appendix 2 to the ESHS Specifications;
- b) Non-hazardous waste: any waste with no properties rendering it hazardous. Non-hazardous waste contaminated by hazardous material will be considered as hazardous waste, unless instructed otherwise by the Engineer;
- c) Inert waste: any waste unaffected by any significant physical, chemical or biological modifications, which does not decompose, burn or produce any physical or chemical reaction, is not biodegradable and does not damage any substance with which it comes into contact in a manner likely to cause damage to the environment or human health.

15.7 The Contractor assesses, documents and effectively implements any local recycling or re-use options for its waste.

15.8 Waste is categorized and stored separately prior to removal from the Project Areas, depending on the level of danger, phase (liquid, solid or gas),

the waste management solution to be applied and its potential in terms of recycling or reuse.

15.9 Waste is collected from each Project Area at the same rate that it is produced and is placed in temporary locations meeting the following criteria:

- a) Located at a distance of over 100 m from any natural sensitive area and over 500 m from any socioeconomic sensitive area (school, market, healthcare centre, water well or catchment area), with the exception of waste storage area in camps;
- b) Protected from moving machinery and vehicles, but easy to access for regular collection;
- c) Located on a flat impervious surface to prevent infiltrations;
- d) Under cover for non-inert waste;
- e) Stored in containers of the appropriate size, tightness and level of resistance depending on the danger and phase (solid, liquid, gas) of the waste;
- f) Liquid wastes storage is equipped with secondary retention with a volume at least equal to the greater of the following two values (i) 100% of the capacity of the largest reservoir and (ii) 50% of the overall capacity of the associated reservoirs;
- g) Hazardous waste stored pursuant to Sub-Clause 26.8 of the ESHS Specifications.

15.10 Waste is removed from Project Areas and transported to recycling, treatment and waste management facilities on a regular basis. The frequency of removal, approved by the Engineer, guarantees:

- a) No overflow from containers;
- b) No unpleasant odour or emissions which are dangerous for human health;
- c) No proliferation of insects, rodents, dogs or other animals which are harmful or dangerous for human health;
- d) Regular cleaning of containers and surfaces on which they are located.

15.11 Unless otherwise specified in the Contract or instructed by the Engineer, waste incineration is prohibited on Project Areas. Two exceptions are medical waste and green waste, which unless instructed to the contrary by the Engineer, are managed pursuant to Clauses 15.15.1 and 16.1.3 of the ESHS Specifications.

The use of third party waste management services is subject to a documented prior audit of the treatment, storage and recycling facilities by the Contractor, to guarantee the conformity with the provisions of the ESHS Specifications on waste.

15.12 Pursuant to Sub-Clause 1.5 of the ESHS Specifications, the provisions applicable to the Contractor regarding waste management also apply to any third-party waste management Subcontractor. The Engineer reserves its right to inspect third party waste management facilities and prohibit the Contractor from using the facilities if considered unacceptable.

15.13 The management of non-hazardous waste complies with the following conditions:

15.13.1 Inert waste is removed or treated on-site and can be disposed in a permanent or temporary landfill with unused backfill material. The location, capacity and environmental protection measures, particularly for water courses, implemented by the Contractor or any Subcontractor, will comply with the provisions of the ESHS Specifications, and will be described in the EPP and validated by the Engineer.

15.13.2 Non-hazardous waste that cannot be recycled is disposed of to landfill, complying with the following criteria:

- a) Walls and base sealed by a geo-membrane or a layer of compacted clay with a permeability 10^{-7} cm/s;
- b) Drained for the recovery of leachates, which are routed to a lagoon aerobic/anaerobic treatment prior to discharge into the natural environment or collected in a temporary storage prior to regular collection and transfer to a treatment unit (septic tank or wastewater treatment plant);
- c) Regularly compacted and covered by earth to limit odours and the proliferation of insects;
- d) When the landfill has reached full capacity, vents are installed to evacuate gases, and the landfill covered by a geo-membrane with a minimum thickness of 1 mm, or a layer of compacted clay, and a top layer of 1.5 m of topsoil, which is revegetated.

Any other proposal must first be validated by the Engineer.

15.14 The Contractor's hazardous waste is managed by a specialized waste Subcontractor, accredited in the Employer's country for this activity.

15.15 In the absence of an existing waste management solution for hazardous waste satisfying the provisions of Sub-Clause 15.14 of the ESHS Specifications, the Contractor takes the following action:

15.15.1 Medical waste is incinerated in a specific facility constructed and accredited for this purpose. The Contractor will submit the technical specifications of the facility to the Engineer before importing or procuring the equipment.

15.15.2 Hydrocarbons, lubricants, paints, solvents and batteries are transported in drums to the capital city, or any other city where suitable waste management facilities are available. Sludge from settling tanks/ponds, septic tanks or oily water skimmers will also be managed in the same way.

15.15.3 Contaminated soils from construction/demolition and drilling muds will be treated, stabilised and disposed of to landfill. Prior approval is required from the Engineer regarding the method and site location. The Contractor obtains authorization from the competent local authorities prior to any disposal to landfill.

15.15.4 Prior approval from the Engineer is required before implementing waste management solutions on any other hazardous waste.

15.15.5 Prior to the issue of the Taking-Over Certificate for the Works, the Contractor provides documentation on hazardous waste landfilled at other sites than accredited third party waste management facilities. The documentation includes a plan showing the location of landfill sites. The document is provided to the competent local authorities whose jurisdiction covers the landfill sites.

16 Vegetation clearing

16.1 The Contractor describes in the Worksite - ESMP the planned methods and schedule for vegetation clearing. Specific agreement from the Engineer is obtained prior to any clearing works.

16.1.1 Vegetation clearing using chemicals is not permitted.

16.1.2 Vegetation clearing using bulldozer is not permitted in zones less than 30 m from areas designated as sensitive by the Engineer, where only manual clearing is authorised.

16.1.3 Unless otherwise specified in the Contract or if otherwise instructed by the Engineer, burning vegetation is not permitted. Green waste can be burnt with prior approval from the Engineer regarding the location, method and schedule.

16.2 Areas cleared prior to undertaking earthworks are shown on a plan with a minimum scale of 1/10,000. Plans are submitted to the Engineer for validation prior to starting clearing works.

16.3 The Contractor undertakes physical demarcation of zones to be cleared

using a method approved by the Engineer.

- 16.4 Trees not to be cut down are identified in relation with the Engineer. Such trees are marked with paint and protected against clearing machinery using a method approved by the Engineer.
- 16.5 Clearing is undertaken without damage to adjacent non-cleared areas. Topsoil is stored within the cleared areas at the edge of the cleared zone. Clearing is undertaken working from the edge of the zone inwards.
- 16.6 Wood with economic value:
 - 16.6.1 During clearing, the Contractor stockpiles separately: (i) tree trunks with a diameter at chest height greater than the size defined by the Engineer, and (ii) trunks with a smaller diameter, branches, leaves, stumps and roots.
 - 16.6.2 Unless instructed otherwise by the Engineer when validating the plans of Sub-Clause 16.2 of the ESHS Specifications or unless specified otherwise in the Employer's country regulations, the trunks of trees exceeding the diameter defined by the Engineer are made available to the local communities, according to the methods defined with the Engineer.

17 Biodiversity

- 17.1 The Contractor shall ensure that all personnel are informed and aware of the importance to protect fauna and flora. Information and awareness training is documented.
- 17.2 The Contractor shall ensure that all personnel are informed and aware of wildlife encounters procedures. Information and awareness training is documented.
- 17.3 The Contractor shall define in the Worksite – ESMP the method with regards to fauna and flora management prior to clearing activities. This method must notably address the work schedule, which sometimes can be adjusted to limit impacts on fauna and flora.
- 17.4 Where possible, areas shall be cleared from one side to another, or from the inside out, to prevent animals becoming trapped.
- 17.5 The Contractor personnel shall not approach, injure, hunt, capture, possess, feed, transport, rear or trade wild animals and/or collect eggs while working on the Project Areas.
- 17.6 The Contractor personnel shall not collect flora species while working on the Project Areas.
- 17.7 The Contractor shall report any sighting or finding of wounded or dead wildlife to the Engineer immediately.
- 17.8 The Contractor shall protect excavations to prevent injury to animals.
- 17.9 The Contractor shall release any trapped uninjured animals immediately.
- 17.10 The Contractor shall not disturb natural habitats outside the Project Areas.
- 17.11 The Contractor shall only use designated roads or paths and abide by speed limits.
- 17.12 The Contractor shall not start forest fires.
- 17.13 The Contractor shall not introduce Invasive Alien Species (IAS).
 - 17.13.1 All construction machinery imported from overseas shall be inspected to detect IAS and washed before dispatching to the Project Areas.
 - 17.13.2 If the presence of topsoil contaminated with IAS is detected, that topsoil shall only be stored or re-spread in the area from where it was removed.
 - 17.13.3 When earthworks are carried out in IAS contaminated areas, vehicles shall be washed before moving them to other areas.
 - 17.13.4 Where necessary, the Contractor shall develop IAS control procedures (e.g. physical removal, slashing, mulching, herbicides, etc.). Methods used to control or prevent such species shall not cause adverse impacts on the environment or communities.

18 Erosion and sediment transport

17.13.5 To limit the risk of introducing marine invasive species, the Contractor shall control the ballast water and anti-fouling systems of vessels arriving from other bioregions in accordance with International Maritime Organization (IMO) conventions and guidelines.

18.1 The Contractor plans earthworks and optimizes the management of space to ensure that all cleared surfaces and areas exposed to soil erosion are minimized on all Project Areas.

18.2 Topsoil:

18.2.1 Unless indicated otherwise by the Engineer, the top 25 centimeters of the soil will be considered as topsoil.

18.2.2 Earthworks for the temporary occupation of the Project Area are preceded by the clearing of topsoil and the storage of this soil separately from the underlying sterile soil.

18.2.3 Topsoil is stored according to the provisions approved by the Engineer to enable reuse during Project Area rehabilitation.

18.2.4 The refurbishment must be done in accordance with the provisions of Clause 19.

18.3 Draining and treatment of rainwater run-off:

18.3.1 The gradient of Project Areas allows the collection and drainage of rainwater from the entire surface area to one or several discharge points. No pools of water are created.

18.3.2 Suspended solids in rainwater are removed using sediment traps / settling ponds. Rainwater from vehicle parking areas, machinery areas, workshops is subject to treatment with oily water separators.

18.3.3 Rainwater treatment units are sized, cleaned, maintained and accessible to ensure compliance with the effluent quality criteria defined in Sub-Clause 12.9 of the ESHS Specifications and to allow monitoring of performance.

18.4 Sediment control:

18.4.1 The Contractor installs sediment control barriers to slow the flow of water and control sediment transport at Project Areas with (i) a gradient of more than 20%, and (ii) where land is disturbed by the Works or where stockpiled mineral material are susceptible to erosion.

18.4.2 Sediment control barriers are installed on the slope or at the base of the slope to protect the natural drainage system from sediment accumulation at levels higher than the natural situation. These barriers comply with the following principles:

- a) Made with geotextiles or straw bales or any other means pre-approved by the Engineer;
- b) Deployed before the start of works and removal of topsoil. Barriers can be used for the physical demarcation of working areas;
- c) Installed, cleaned, maintained and replaced according to manufacturer recommendations;
- d) Drainage surface area does not exceed 1,000 m² per 30 m of barrier. The length of the slope behind the barrier is less than 30 m, and is not used for flows in excess of 30 l/s.

18.4.3 For the dredging of marine sediments, unless specified otherwise in the Contract, or instructed otherwise by the Engineer, and particularly if the working area is exposed to currents, the Contractor will install a geotextile silt curtain, or any other technique approved by the Engineer to control turbidity clouds.

18.5 Backfilling and stockpiling of backfill materials:

18.5.1 In the EPP of these temporary and permanent stockpiles, the Contractor defines the proposed arrangements (height, slope,

drainage, revegetation, etc.) to guarantee stability and erosion resistance.

18.5.2 For permanent backfill material stockpiles, the stockpile is shaped and compacted to ensure long-term stability.

18.5.3 Temporary stockpiles likely to result in strong erosion (duration of storage, rainy season, presence of downstream issues, etc.) are protected against runoff erosion by (i) revegetation using fast growing grass species, either by direct seeding or by hydro-seeding, or (ii) using other natural anti-erosion cover with prior approval from the Engineer.

19 Site rehabilitation

19.1 Unless instructed otherwise by the Engineer, the Contractor will rehabilitate all Project Areas disturbed by the Works, prior to the provisional acceptance of the Works.

19.2 All buildings and free standing and underground structures (e.g. piping, underground tanks, sumps and basins) are removed pursuant to the provisions of Sub-Clause 4.23 of the CC. All waste and rubble is removed in accordance to the provisions of Clause 15 of the ESHS Specifications. After removal of buildings structures and rubble, the Contractor returns Project Areas to their original condition, according to the following provisions.

19.2.1 Land is adjusted to ensure that run-off water drains without eroding soil or stagnating in pools. Unless instructed otherwise by the Engineer, the gradients of restored sites (excluding backfill as defined in Sub-Clause 18.5 of the ESHS Specifications) must be as for the adjacent undisturbed land.

19.2.2 Rehabilitated Project Areas do not represent hazards for people. Areas near steep drops at quarries are indicated with permanent concrete signs. Holes are refilled. Sharp or unstable items are rendered inoffensive.

19.2.3 Unless specified otherwise in the Contract, or instructed otherwise by the Engineer, the Contractor undertakes revegetation of all Project Areas disturbed by the Works and bears the cost of such work.

19.2.4 Topsoil set aside during initial earthworks pursuant to Sub-Clause 18.2 of the ESHS Specifications, is evenly spread over cleared areas. The surface of compacted soils on Project Areas is loosened by scouring (using rakes or other acceptable methods).

19.2.5 The Contractor describes in the Worksite - ESMP the planned revegetation works to ensure sustainable Project Area rehabilitation: methods, plant species to be used and their origins, activity schedule based on a progressive taking over of Project Areas.

19.2.6 Prior approval by the Engineer is required regarding the origin of seeds and plants proposed by the Contractor. The species used for revegetation must be suitable for the local environmental conditions, and selected according to the rehabilitation program: stabilization of backfill, landscaping, drainage, prevention of erosion, etc.

19.2.7 Revegetation is undertaken throughout the duration of construction Works, and is not limited to the rehabilitation of Project Areas at completion of the Works.

20 Documentation on the Project Area condition

20.1 The Constructor documents changes in condition of all Project Areas from the start of Works until the Performance Certificate is issued. Documentation comprises dated and geo-referenced colour photographs taken from a constant angle and viewpoint.

20.2 The Project Area condition is documented as a minimum for the following stages:

- a) Before any Project Area disturbance at the start of works;
- b) On completion of Works, but prior to starting rehabilitation;
- c) On completion of rehabilitation and revegetation, if necessary, but prior to the Taking-Over Certificate issuing;

- d) After the end of the Defects Notification Period and prior to the Performance Certificate issuing.
- 20.3 The Contractor specifies in the Worksite – ESMP: (i) the list of viewpoints to be used, (ii) areas to be photographed, and (iii) methods used for taking and archiving photographs.
- 20.4 Adjacent areas (100 m from the perimeter of the Project Area) are included in photographic documentation.
- 20.5 Unless instructed otherwise by the Engineer, structures to be buried are photographed weekly until covered. As a minimum the structures are photographed twice for Works with duration of less than 7 days, and at least once a week for Works with a longer duration.
- 20.6 Photographs subject to the present Clause 20 are archived in digital format and provided to the Engineer on a monthly basis under the CC Sub-Clause 4.21 monthly progress report.
- 20.7 The nomenclature of electronic files for photographs explicitly indicates the Project Area, date and structure documented.

C. Health & Safety

21 Health and Safety Plan

- 21.1 In application of Clauses 4 and 6 of the CC, the Contractor describes in the Health and Safety Plan section of the Worksite - ESMP its organization for managing health and safety (section 7 of Worksite – ESMP as described in Appendix 1 to the ESHS Specifications), pursuant to its Health and Safety Management System (HSMS).
- 21.2 Pursuant to Clause 6 of the CC, the plan identifies and specifies:
 - a) All health and safety risks relating to the execution of the Works, by also identifying gender-specific risks;
 - b) Prevention and protection measures to control risks related to the execution of the Works, by differentiating, where necessary, measures concerning the protection of women and men;
 - c) Human and material resources involved;
 - d) Works requiring work permits; and
 - e) Emergency plans to be implemented in the case of an accident.
- 21.3 In addition, this Health and Safety Plan describes how workers are trained in health and safety aspects.
- 21.4 The Contractor implements prevention, protection and monitoring measures, as described in the Health and Safety Plan.

22 Daily and weekly meetings

- 22.1 The Contractor organizes as a minimum one health and safety meeting per Project Area per week (or at another frequency approved by the Engineer) with all the personnel assigned to the Project Area. This applies only to Project Areas where work is ongoing. At the meeting accidents and incidents that occurred in the previous week are discussed and feedback provided. Means of improvements are identified, documented and assessed to establish corrective actions. The Engineer is invited to participate at all health and safety meetings. Meeting reports are provided to the Engineer.
- 22.2 The Contractor organizes daily (or at another frequency approved by the Engineer) health and safety meetings per team at all Project Areas, prior to the start of the daily work. The meeting establishes the health and safety risks associated with the day's tasks and activities, and means of prevention and protection to be implemented. Minutes of the meetings shall be recorded.

23 Equipment and operating standards

- 23.1 The facilities and equipment used by the Contractor are installed, maintained, revised, inspected and tested pursuant to the manufacturer's recommendations. The recommendations are available in the language of communication defined under CC Sub-Clause 1.4 (or any other language approved by the Engineer).
- 23.2 The Contractor lists and describes in the Health and Safety Plan the national and international standards, guidelines and industry codes of practice,

- applied during the execution of works.
- 24 Work permit**
- 24.1 Unless otherwise provided in the Contract, or unless otherwise instructed by the Engineer, work requiring work permits are defined in the Health and Safety Plan. Work permits will be documented and saved.
- 24.2 The Contractor puts in place a work permit procedure to manage risks through the implementation of prevention and protection measures prior to the starting of work. This procedure is subject to validation by the Engineer.
- 25 Personal protective equipment**
- 25.1 The Contractor ensures that all personnel, visitors or third parties entering a Project Area are equipped with Personal Protection Equipment (PPE) pursuant to the practices and standards specified in Clause 9.
- 25.2 The Contractor describes in the Health and Safety Plan the PPE to be used per Project Area and per activity.
- 25.3 Personnel and visitors to Project Areas are equipped with a safety helmet, safety shoes and a reflective jacket as a minimum.
- 25.4 Adequate quantities of PPE are available on the Project Areas. Storage conditions must be compatible with usage pursuant to the provisions of Sub-Clause 23.1 of the ESHS Specifications.
- 25.5 Contractor personnel are trained in how to use and care for PPE and the Engineer must be able to obtain the training reports.
- 26 Dangerous substances**
- 26.1 A substance is considered dangerous if one or several of its properties render it dangerous, as defined in Appendix 2 to the ESHS Specifications. The Contractor identifies and manages dangerous substances planned for use on the Project Area in the manner described in the present Clause 26.
- 26.2 Details of risks and related prevention and protection measures are included in the Health and Safety Plan.
- 26.3 The assessment of the impact of the toxicity of dangerous substances on the reproductive functions of women and men must be taken into account.
- 26.4 The transport to the Project Area and use of dangerous substances requires prior authorization from the Engineer.
- 26.5 The Contractor obtains all necessary authorizations and/or licenses for the storage and use of dangerous substances from local authorities. A copy of the authorizations is provided to the Engineer.
- 26.6 For each dangerous substance used, the Contractor will implement the recommendations described (i) in the Material Safety Data Sheets (MSDS), and (ii) by the Globally Harmonized System of Classification and Labelling of Chemicals established by the United Nations for hazardous chemicals.
- 26.7 Copies of MSDSs are kept on the Project Area, and made available to personnel. The Contractor's staff is aware of the health and safety risks related to hazardous materials. The Contractor provides the Engineer with copies of all MSDSs and training reports.
- 26.8 Storage of dangerous substances
- 26.8.1 Storage area are designed and equipped by the Contractor based on the chemical and physical properties of the substances, on the types of containers stored, the number of people requiring access, the ventilation requirements, the quantities of the substance used and potential chemical reaction with other substances (see Sub-Clause 26.8.5 of the ESHS Specifications).
- 26.8.2 Pursuant to Sub-Clause 15.6 of the ESHS Specifications, the Contractor anticipates and plans for the storage and management of hazardous waste.
- 26.8.3 Storage areas for dangerous substances are subject to strict rules, which are regularly checked by the ESHS Manager appointed pursuant to Sub-Clause 4.1.4 of the ESHS Specifications. The rules include the following as a minimum:
- a) Access to the storage area is limited to trained and authorised individuals;

- b) An inventory is maintained up-to-date;
- c) MSDSs must be available for all stored dangerous substances, and the substances must be clearly labelled;
- d) A strict and methodical storage system is implemented (storage plan posted, large or heavy packaging may not be stored at heights, equipment and tools may not be stored in the dangerous substance storage room);
- e) Compliance with product expiry dates and implementation of a disposal procedure for substances which are not needed or which have expired;
- f) Entrances, exits and access to emergency equipment are kept clear at all times.

26.8.4 Storage areas are clearly identified with warning signs at the entrance. The Contractor displays the storage plan (location of the different products, maximum inventory), a summary of labelling system and information on chemical incompatibilities.

26.8.5 Chemicals which could react together (leading to explosions, fire, projections or the emission of dangerous gases) are physically separated.

26.8.6 Products that react violently with water are stored so as to prevent contact with water, even in the event of flooding.

26.8.7 Inflammable products are stored separately in a dedicated area with adequate ventilation at all times.

26.8.8 Buildings used to store large quantities of dangerous substances are isolated from other buildings to avoid the spreading of fire. Such buildings are constructed using solid and non-combustible building materials, and are equipped with evacuation systems and the appropriate firefighting equipment. Access to the buildings is clear, allowing for rapid evacuation in the event of an accident. The electrical systems are reduced to the essential minimum, and access points are equipped with adequate lighting (300 lux).

26.8.9 All storage areas are equipped with secondary retentions. Each storage area acts as a general secondary retention. Suitable absorbents (neutralizing and non-combustible) are available in the storage area to clean up any spills and leaks.

26.8.10 The Contractor maintains the storage area at a suitable temperature for storing dangerous substances at an appropriate level to avoid any deterioration of the containers.

27 Planning for emergency situation

27.1 The emergency plan required in application of Sub-Clause 21.2 of the ESHS Specifications covers the following emergency situations as a minimum:

- a) Fire or explosion;
- b) Structural failure;
- c) Loss of the containment of dangerous substances;
- d) Safety incident or malicious act;
- e) Natural disasters.

27.2 The Contractor details the emergency plan in the Health and Safety Plan.

27.3 The Contractor ensures that all personnel are informed and aware of how to react in an emergency situation, and responsibilities are defined. Information and awareness training are documented, and available on all Project Areas.

27.4 The Contractor organizes and documents emergency simulation exercises within 3 months of the physical start of the Works, and subsequently once every 12 months up to the issue of the Taking-Over Certificate. The Engineer is invited to participate in each of these exercises.

27.5 Fire extinguishers are made available in each building at clearly identified

- locations.
- 28 Medical check-ups**
- 28.1 The Contractor organizes medical check-ups for all Contractor's Personnel prior to the initial mobilization to the Project Area to check aptitude for the work. Medical check-ups are adapted to the anticipated occupied positions and carried out pursuant to the recommendations of the International Labour Organization. Subsequent to the check-up, a written medical certificate is issued declaring the aptitude of the worker for the allocated tasks.
- 28.2 Hearing tests are conducted for the Contractor's personnel exposed to specific risks (such as noise levels above 80 dB(A), exposure to hazardous materials, etc.) in order to establish an initial state of health. Annual tests are carried out to monitor any changes and detect any deterioration.
- 28.3 The Engineer can request additional medical examinations for the Contractor's Personnel if considered necessary, and all associated costs shall be borne by the Contractor.
- 28.4 A medical examination is carried out on any Contractor's Personnel returning to work after leave caused by a work related accident. A written medical certificate is issued confirming the Contractor's Personnel's aptitude to return to work at the designated workstation.
- 28.5 The Contractor can produce a copy of its Contractor's Personnel's work aptitude certificates at the request of the Engineer or any competent authority.
- 28.6 Specific arrangements for tasks' assignments or workstations shall be made for pregnant Personnel.
- 29 First aid**
- 29.1 The Contractor ensures that at least one first aid officer is present at all times during working hours per Project Area and per team of 10 to 50 workers present, and one extra first aid officer for each additional 100 workers.
- 29.2 The Project Area must be equipped with a communication system available immediately and primarily for the purposes of communication with the first aid services. Information on how to communicate with the first aid services is clearly indicated near the communications equipment.
- 30 Health care centre & medical personnel**
- 30.1 For Project Areas with more than 35 workers present at any one time and where it is not possible to reach a hospital, medical clinic or the Contractor's health centre within a period of 45 minutes, by land and in normal conditions:
- 30.1.1 The Contractor sets up a health care centre at its own cost. This centre is:
- a) Operational and easy to access all times;
 - b) Kept clean and in good condition;
 - c) Equipped with appropriate heating or air-conditioning;
 - d) Equipped with sanitary facilities and drinking water;
 - e) Equipped with instruments, equipment, medicines and material required to examine and treat injured or sick workers in emergency conditions;
 - f) Equipped with the supplies and furnishing required to allow medical personnel to provide first aid and fulfil their other functions.
- 30.1.2 A doctor is present on-site at all times, working full-time during normal day hours. The doctor is on-call when more than 20 workers are working simultaneously outside of normal day hours.
- 30.1.3 The doctor has the following profile:
- a) At least 5 years' experience on large-scale construction works at sites located at a distance from a hospital;
 - b) Trained in infectious diseases, waterborne and epidemiological

- diseases prevalent in the Employer's country;
 - c) Able to lead training sessions on occupational health and first aid;
 - d) Trained in management and logistics for a remote health care centre;
 - e) Able to speak the same working language used by most members of personnel fluently (communication in emergency situations);
 - f) In good physical condition, able to access remote working areas.
- 30.1.4 The Contractor allocates a road or air vehicle for first aid purposes to the first aid station pursuant to standard NF EN 1789/2007.
- 30.1.5 The Contractor ensures the presence of at least one nurse to assist the doctor per team with 200 - 800 workers allocated, and one extra nurse for each additional 600 workers allocated to this team. Over and above 500 workers per team, the Contractor ensures the presence of an extra doctor for each additional 500 workers allocated to this team.
- 31 First aid kits**
- 31.1 Each Project Area must be equipped with an adequate number of first aid kits to ensure that all workers can access these kits in approximately 5 minutes. Kits must be available at all times.
- 31.2 Each vehicle is equipped with a first aid kit.
- 31.3 First aid equipment complies with attached specifications.
- 32 Emergency medical evacuations**
- 32.1 The Contractor establishes, and provides the Engineer within one month of the physical start of works a copy of an agreement with a specialized company for the handling of personnel in the event of a serious accident requiring an emergency medical evacuation, which cannot be organized using the first aid vehicle specified in Sub-Clause 30.1.4 of the ESHS Specifications without endangering the life of the patient.
- 32.2 The agreement includes a convention with a referring hospital where the member of personnel evacuated in emergency conditions will be treated.
- 32.3 The agreement covers the use of air transportation in order to evacuate the injured patient(s) to the referring hospital.
- 33 Access to health care**
- 33.1 The Contractor guarantees access to health care as defined in Clause 30 for all personnel in necessary cases of accident or illness occurring during the execution of the Works, i.e.:
- a) Medical check-ups: initial (recruitment), annual and upon returning to work after sick leave;
 - b) Screening, vaccinations and preventive healthcare;
 - c) General healthcare during the execution of the Works;
 - d) Medical assistance in the event of an accident and assistance for emergency evacuations.
- 33.2 Subcontractor's personnel, other contractors, the Employer or the Engineer, present at the Project Area, must never be refused medical assistance, under the pretext that they are not directly employed by the Contractor. The Contractor may however define a unit rate cost per medical act for personnel, other than its own Contractor's Personnel, display this rate in the healthcare centre and forward the information to the Engineer.
- 33.3 In the event of accident or serious illness, medical personnel must be trained, available and equipped with the necessary material, medicines and consumables to provide first aid for the patient, stabilize their condition, until the patient is:
- a) Either treated or discharged; or
 - b) Hospitalized at the camp or in a larger hospital; or
 - c) Evacuated to a medical centre which is well equipped for intensive care, if necessary.
- 34 Health monitoring**
- 34.1 The Contractor cannot recruit workers in poor health.
- 34.2 The initial pre-recruitment examination must confirm that applicants carry

no infectious diseases and are physically able to carry out the tasks required for the position.

- 34.3 The detection of pregnancy during the initial pre-recruitment examination of female applicants shall not constitute grounds for declining recruitment, unless medical risk is proven.
- 34.4 The Contractor organizes annual medical check-ups for its Contractor's Personnel and keeps up to date a medical record for each Contractor's Personnel. The presence of Contractor's Personnel for medical check-ups, treatment and hospitalization is incorporated into the Contractor's planning.
- 34.5 The Contractor provides the Contractor's Personnel with prophylaxis and vaccinations against local diseases and vectors. In particular, the Contractor will promote the use of impregnated mosquito nets by its Contractor's Personnel in camps or off-site lodging, and distributes these nets appropriately.
- 34.6 The Health and Safety Plan includes a Contractor's Personnel health risk assessment based on exposure to specific risks (such as noise levels above 80dB(A), exposure to hazardous materials, etc.) and describes the medical monitoring implemented.

35 Sanitary repatriation

- 35.1 The Contractor is responsible for the sanitary repatriation of Contractor's Personnel in the event of a serious injury or illness. The Contractor will take out the necessary insurance to cover the cost of the sanitary repatriation of its Contractor's Personnel.

36 Hygiene, accommodation and food

- 36.1 Drinking water:
 - 36.1.1 Pursuant to Sub-Clause 6.14 of the CC, the Contractor provides personnel with drinking water at all Project Areas. The quantity and quality of this water complies with the standards of the World Health Organization at supply points.
 - 36.1.2 Unless the supply of drinking water is provided by a certified supplier, the quality of the drinking water provided to workers is tested at least at the start of the Works and then on a monthly basis. The protocol for taking and analyzing samples is based on the recommendations of the World Health Organization. The results shall be documented and made available on the Project Areas.
- 36.2 Accommodation conditions:
 - 36.2.1 The accommodation provided for non-resident Personnel in a camp or an alternative structure outside of the Project Areas, such as a hotel or rented house, will comply with the conditions of Sub-Clause 36.2 of the ESHS Specifications in pursuance of Sub-Clause 6.6 of the CC.
 - 36.2.2 Unless specified otherwise in the Contract, or instructed otherwise by the Engineer, Personnel are housed in rooms. Rooms do not host more than 4 individuals, with no bunk beds, and with 0.5 m³ of storage space available per person.
 - 36.2.3 Rooms shall not be mixed: separate rooms must be made available for both men and women.
 - 36.2.4 Rooms are lit and equipped with power sockets, beds and windows fitted with mosquito nets. Flooring is of a hard and impervious material.
 - 36.2.5 The temperature in rooms and common areas shall be kept at an appropriate level during occupied hours.
 - 36.2.6 Night-time noise levels to which personnel are exposed comply with the limits recommended by the World Health Organization.
 - 36.2.7 The Contractor provides one drinking water tap per 10 Contractor's Personnel, one shower per 10 Contractor's Personnel as a minimum, one individual toilet for 15 Contractor's Personnel as a minimum, and one urinal per 25 Contractor's Personnel at accommodation camps. Separate showers, toilets and locker-rooms must be made available for women.

36.2.8 The Contractor constructs and maintains a shared leisure area in each camp and a sports field for use by Personnel.

36.3 Hygiene in shared areas:

36.3.1 Sanitary areas (showers, sinks, urinals, toilets) are cleaned and disinfected by the Contractor's cleaning service at least once every 24 hours. Cleaning operations are documented.

36.3.2 The canteen, kitchen and kitchen utensils are cleaned after each meal service.

36.3.3 The number and location of toilets on Project Areas shall be adapted to the number of employees and the configuration of the Project Areas (distance, isolated area, etc.). Separate toilets will be made available for women.

36.4 Food:

36.4.1 In application of Sub-Clause 6.13 of the CC and Sub-Clause 41.1 of the ESHS Specifications, the Contractor provides meals at a reasonable cost to its Contractor's Personnel in a canteen area and according to a procurement system which complies with the provisions of Sub-Clause 36.4 of the ESHS Specifications.

36.4.2 The Contractor defines and implements actions in order to guarantee (i) the quality and quantities of food stuffs, (ii) compliance with health rules when preparing meals, (iii) fitting out and servicing premises and equipment, both in the kitchen and food storage areas.

36.4.3 The Contractor inspects the cleanliness of food transport vehicles, temperature control and the cold chain, as well as best before dates, and takes the necessary corrective actions. The temperatures of chillers are regularly checked.

36.4.4 The Contractor checks that health requirements are met for food storage conditions in the kitchen or other locations, food cooking times and temperatures, and the conditions in which prepared products are left prior to consumption, to ensure no health risks. No food remains are to be reused.

36.4.5 The Contractor recruits trained canteen personnel and ensures that supervisors monitor compliance with sanitary instructions. The Contractor ensures that canteen personnel have means of ensuring compliance with health rules (changing rooms, linen, hand washers, the condition of flooring and paint, and the existence of a cleaning plan).

36.5 The ESHS Manager carries out an audit on all Project Areas every 3 months, and documents the results, and includes the conditions of hygiene in which meals are prepared and food conserved. The results of this audit are provided to the Engineer.

36.6 The ESHS Manager regularly informs Contractor's Personnel on appropriate behaviour in terms of workplace hygiene. This information is documented and saved.

37 Substance abuse

37.1 Pursuant to Sub-Clause 6.16 of the CC, the use, possession, distribution or sale of illegal drugs, controlled substances (as per local regulations) and alcohol is totally prohibited on the Project Areas. The Contractor implements a zero-tolerance policy for the consumption of these substances.

37.2 Any person suspected by the Engineer to be under the influence of alcohol or controlled substances on any Project Area is immediately suspended from his position by the Contractor, pending the results of medical tests.

D. Local Labour and Relations with Local Communities

38 Labour conditions

38.1 The Contractor should ensure decent labour conditions for workers and notably compliance with applicable law and regulations in the country of implementation of the contract, and with the fundamental conventions of the International Labour Organization (ILO). This includes workers' rights related to wages, working hours, rest and leave, overtime, minimum age,

regular payment, compensation and benefits. The Contractor should respect and facilitate workers' rights to organize and provide a grievance mechanism for all direct and indirect workers. The Contractor should implement non-discrimination and equal opportunity practices, and ensure prohibition of child or forced labour.

39 Local recruitment

- 39.1 Local recruitment is defined as the number of positions actually allocated to people residing in the region of the Works, which must be defined by the Contractor in its offer according to relevant criteria by giving priority to populations living in the area of influence or in the immediate proximity of the Project Area.
- 39.2 Pursuant to Sub-Clause 6.1 of the CC, the Contractor implements a voluntary local recruitment policy for its personnel for the duration of the Works and shall enforce this policy to its Subcontractors.
- 39.3 The Contractor demonstrates the effective implementation of this voluntary policy to the Engineer in its monthly activity report as defined in Sub-Clause 6.3 of the ESHS Specifications.
- 39.4 Pursuant to Clause 8 of the ESHS Specifications, the Contractor shall develop a training program. This training program must be open to women and men and be adapted to their level of education and needs of each group to occupy the positions proposed during the Works.
- 39.5 Local labour needs are estimated prior to the start of Works and described in the Worksite - ESMP with the following information:
- a) Identification of positions that could be filled by local staff and the level of qualification required;
 - b) Definition of the planned procedure for the effective recruitment of these members of staff;
 - c) Establishment of mechanisms to ensure non-discrimination of women in accessing recruitment procedures. This mechanism must cover the definition of the positions, the methods of communication on the positions to be filled, etc.;
 - d) Deployment schedule for these positions;
 - e) Initial training to be provided by the Contractor for each job description.
- 39.6 In order to prevent outsiders from entering the Project Area, local recruitment at the Project Area, including at the entrance, is prohibited.
- 39.7 Local recruitment office:
- 39.7.1 Prior to the start of works, the Contractor establishes a local recruitment office in the district where the main Project Area is located, at a location pre-approved by the Engineer.
 - 39.7.2 A representative of the Contractor is present in this office at least two mornings each week, from the start of the Works to a date pre-approved by the Engineer.
 - 39.7.3 The representative provides information on job vacancies with the Contractor for the execution of the Works (required qualifications, duration, and location) and on the information to be provided in applications.
 - 39.7.4 Lists of local candidates are drafted by the representative allocated to the office and forwarded to the Contractor's humanresources manager on a weekly basis.
- 39.8 The Contractor's Human Resources manager selects candidates listed by the local recruitment office based on requirements for the Works and the Contractor's recruitment procedures. A written contract between the Contractor and the local Contractor's Personnel is drafted, signed and archived by the Contractor.
- 39.9 If the Project Areas are located near to several different communities, the Human Resources manager ensures a fair distribution of local recruitment

between the different communities, by giving priority to the people affected by the project.

- 39.10 The Human Resources manager will ensure that recruitment campaigns in local communities have been spread to women and that the latter have not been discriminated in recruitments.
- 39.11 Pursuant to Sub-Clause 6.22 of the CC, the Contractor maintains one record per local Contractor's Personnel indicating the hours worked per person allocated to the Works, the type of tasks carried out, the wages paid and any training taken. Records are available at the main Project Area at all times, so the Engineer and the authorised representatives of the government can assess the content.
- 40 Transport & accommodation**
- 40.1 Unless specified otherwise in the Contract, or instructed otherwise by the Engineer, the Contractor provides or enables access to daily transport for Contractor's Personnel living more than 15 minutes' walk from the Project Area and more than one hour by land transport.
- 40.2 The transport is organized under conditions which comply with local regulations and which ensure the safety of the people transported.
- 40.3 The Contractor organizes collective transport: pick-up times and locations are defined and services organized appropriately.
- 40.4 If the Project Area is moved during the working season and if the Contractor retains the local personnel trained at the start of the Works, the accommodation of the Contractor's Personnel is managed by the Contractor:
- a) Within a mobile camp with the other non-local Contractor's Personnel; or
 - b) In villages located near to the mobile Project Area, in this case, each local Contractor's Personnel will receive a housing allowance in addition to his wages.
- 41 Meals**
- 41.1 Food supplies for the meals of the Contractor personnel will exclude any meat obtained from hunting or poaching, with the exception of fish.
- 41.2 The Contractor provides at least two meals per day to local Contractor's Personnel pursuant to the hygiene conditions specified in Clause 36 of the ESHS Specifications, at reasonable price.
- 42 Damage to people and property**
- 42.1 The Contractor shall not disturb or interfere with the inhabitants of local communities close to or in the Project Area, and shall respect their houses, cultures, animals, properties, customs and practices.
- 42.2 Pursuant to Sub-Clauses 4.14 and 17.1 of the CC, the Contractor is responsible for damages to people and property caused by the execution of the Works or the procedures used for execution.
- 42.3 Access to the Project Areas is prohibited to unauthorized persons. The Contractor is responsible for the security and access control of the Project Areas.
- 42.4 The Engineer is informed of any damage caused to people, or the property of individuals, other than the Contractor's personnel, within 6 hours of the event, regardless of the value of the prejudice.
- 42.5 Housing existing before the start of the Works, located within a minimum radius of 800 m around the perimeter of the quarries and within a minimum radius of 500 m around the other Project Areas that will be subject to blasting, will be examined by a bailiff unless agreed upon otherwise with the Engineer.
- 42.6 The bailiff's sworn statement is prepared and provided to the Engineer with the EPP.
- 42.7 Should any problems be detected due to the intensity of blasting, the Engineer is entitled to request that the Contractor carry out seismic measurements of the intensity of the vibrations induced by the blasting, at variable distances from the blasting points, under the supervision of the Engineer, and at the cost of the Contractor.

43 Land acquisition and land take

- 43.1 Pursuant to Sub-Clause 7.8 of the CC, the Contractor will cover (i) occupancy indemnities for the extraction or use of construction materials and (ii) the cost of acquiring or temporarily occupying the necessary land to stockpile excess backfill material.
- 43.2 The Contractor provides compensation for any prejudice suffered by the owners and users of this land, if these users are not the same parties as the owners.
- 43.3 The Contractor demonstrates to the Engineer (i) who are the owner and the users, if different parties have been identified, and (ii) a written agreement governing the temporary occupancy or acquisition of this land has been negotiated and duly paid up to the two parties, if different.

44 Traffic

- 44.1 The Contractor defines a Traffic Management Plan in Worksite - ESMP (section 11 as defined in Appendix 1 to the ESHS Specifications).
- 44.2 The Traffic Management Plan:
 - a) includes the characteristics of its fleet of vehicles and site machinery; and
 - b) defines the itineraries used on a map for each route between the different Project Areas that must be validated by the Engineer.
- 44.3 The Contractor requests that the Employer obtain the authorizations of the competent administrative authorities if public roads are used. Any Engineer's instruction to update the Traffic Management Plan shall be implemented.
- 44.4 Within one month of the physical start of Works, the Contractor informs the administrative authorities of areas crossed by the Contractor's vehicles, of the itinerary and characteristics (frequency of passing, size and weight of trucks, materials carried) of the Contractor's fleet of vehicles.
- 44.5 If public roads are used, and unless approved otherwise by the Engineer, the Contractor mandates a bailiff to make a sworn report regarding the state of the road prior to use by the Contractor's vehicles. The report is annexed to the Traffic Management Plan.
- 44.6 The Contractor describes in the Traffic Management Plan the expected traffic created by its fleet of vehicles (frequency of trips between Project Areas, working hours, convoys).
- 44.7 The Contractor also describes the number and positioning of flagmen.
- 44.8 Unless specified otherwise in the Contract or instructed otherwise by the Engineer, heavy vehicles (i.e. with a GVWR of more than 3.5 tons) may not be used at night between 22:00 and 06:00.
- 44.9 Speed limits:
 - 44.9.1 The Contractor takes action to limit and check the speed of all vehicles and machinery used to execute the Works.
 - 44.9.2 The maximum speed of all machinery and vehicles of the Contractor comply with the lowest of the following: the speed limit defined according to the Employer's country regulations or the following limits.
 - a) 10 km/h within the Project Area;
 - b) 30 km/h in villages or hamlets, in towns, from 100 m before the first house;
 - c) 80 km/h on unpaved roads outside of towns, villages, hamlets and camps.
 - 44.9.3 Pursuant to Sub-Clause 4.15 of the CC, and in coordination with the competent Employer's country authorities, the Contractor provides and installs signs for the fleet of vehicles along public roads, when public signs are inadequate.
 - 44.9.4 The Contractor provides each of its drivers with a map at the appropriate scale of the roads authorised for the execution of the Works, clearly indicating the maximum speeds authorised, and ensures

their understanding.

- 44.10 It is strictly prohibited to transport people, equipment or products other than those required for the Works and the management of Project Areas, on board any of the Contractor's vehicles. This provision also applies to the transport of live animals and meat obtained from hunting, fishing or poaching.
- 44.11 The trailers and skips used to carry materials which could be projected (sand, crushed material, aggregates, selected materials) are covered with a tarpaulin for the entire itinerary between two Project Areas.
- 44.12 The Contractor carries out regular inspections along the roads used by its fleet of vehicles to ensure compliance with the provisions of Clauses 44.8 to 44.11 of the ESHS Specifications. The Contractor records these inspections and the results and transmits a summary of checks carried out for the previous month to the Engineer on a monthly basis.

APPENDIX-1 TO ESHS SPECIFICATIONS

CONTENTS OF WORKSITE – ESMP

1.	Environmental policy	<ul style="list-style-type: none"> ➤ Declaration of ESHS policy signed by the managing director of the Contractor and clearly defining the commitment of the Contractor in terms of (i) ESHS management for its construction sites and (ii) compliance with the ESHS Specifications of the Contract.
2.	Worksite -ESMP	<ul style="list-style-type: none"> ➤ Target and content of the Worksite Environmental and Social Management Plan ➤ Preparation and updating schedule ➤ Quality assurance and validation
3.	ESHS resources	<ul style="list-style-type: none"> ➤ Human resources: <ul style="list-style-type: none"> – ESHS Manager – ESHS Supervisors – Person in charge of relations with stakeholders – Medical personnel ➤ Logistics& communications: <ul style="list-style-type: none"> – ESHS vehicles – IT stations – In situ noise, air and water measuring equipment – Analysis laboratory used ➤ Reporting: <ul style="list-style-type: none"> – Weekly inspections – Monthly – Accident / Incident
4.	ESHS regulations	<ul style="list-style-type: none"> ➤ Definition of standards for the applicable national ESHS regulations and the ESHS recommendations of institutions affiliated to the United Nations (WHO, ILO, IMO, IFC), applicable to the execution of works: <ul style="list-style-type: none"> – Discharge standards – Minimum wage – Day and/or night traffic restrictions – Other ➤ Definition of ESHS standards for the industry applied
5.	ESHS operational inspection resources	<ul style="list-style-type: none"> ➤ Site tracking procedure: <ul style="list-style-type: none"> – Frequency – Personnel – Assessment criteria ➤ Non-conformity handling and detection procedure: <ul style="list-style-type: none"> – Distribution information – Notification depending on the level of importance allocated to non-conformities – Tracking of the closing of the non-conformities ➤ Management of data on tracking and non-conformities: <ul style="list-style-type: none"> – Archiving – Use as a performance indicator
6.	Project Areas	<ul style="list-style-type: none"> ➤ Description of Project Areas (as per definition in Sub-Clause 1.3 of the ESHS Specifications): <ul style="list-style-type: none"> – Number – Location on a topographical map

		<ul style="list-style-type: none"> – Activities – Opening & closing schedule – Access ➤ Reference to the Appendix: an Environment Protection Plan (EPP) for each Project Area
7.	Health and Safety Plan	<ul style="list-style-type: none"> ➤ Identification and characterization of health and safety risks, including the exposure of personnel to chemicals, biological hazards and radiation ➤ Description of working methods to minimize hazards and control risks ➤ List of the types of work for which a work permit is required. ➤ Personal protection equipment. ➤ Presentation of the medical facilities at Project Areas: <ul style="list-style-type: none"> – Healthcare centre, medical equipment and allocation of medical staff – Medical acts that can be carried out on-site – Ambulance, communications – Referring hospital ➤ Evacuation procedure for medical emergencies. ➤ Description of the internal organization and action to be taken in the event of an accident or incident.
8.	Training plan	<ul style="list-style-type: none"> ➤ Basic training for non-qualified staff ➤ Health & safety training
9.	Labour Conditions	<ul style="list-style-type: none"> ➤ Description of Human Resource Policy for construction works of direct and indirect workers
10.	Local recruitment	<ul style="list-style-type: none"> ➤ Local labour requirements: <ul style="list-style-type: none"> – Job descriptions and the levels of qualifications required – Recruitment procedure and deployment schedule – Initial training to be provided by the Contractor for each job description ➤ Location and management of the local recruitment office(s)
11.	Traffic Management Plan	<ul style="list-style-type: none"> ➤ Description of the fleet of vehicles/machinery used for the execution of the Works ➤ Deployment (Project Area & schedule) and maintenance sites for each vehicle and machine ➤ Mapping of itineraries, travel times, and areas where speeds are limited ➤ Dust suppression: <ul style="list-style-type: none"> – Mapping or road sections where dust reduction initiatives apply – Water points identified or to be created for refuelling tanker trucks – Capacity of the tanker trucks used and calculation of the number of trucks required – Width of the track to determine if one watering run or equivalent is adequate (narrow track) or if two runs are required (wide track) – Number of watering or equivalent operations proposed per day depending on the climate
12.	Dangerous products	<ul style="list-style-type: none"> ➤ Inventory of dangerous products per Project Area and per period ➤ Transport and storage conditions and chemical incompatibility
13.	Effluents	<ul style="list-style-type: none"> ➤ Characterization of effluents discharged to the receiving environment ➤ Facilities for the treatment or pre-treatment of effluents ➤ Measures for reducing the sediment content of rainwater runoff ➤ Measures for monitoring the efficiency and performance of facilities for reducing sediment content of rainwater runoff ➤ Resources and methods for monitoring effluent and rainwater runoff quality

14.	Noise and vibrations	<ul style="list-style-type: none"> ➤ Estimation of the frequencies, duration, days of the week and noise levels per Project Area
15.	Waste	<ul style="list-style-type: none"> ➤ Inventory of waste per Project Area and per period ➤ Collection, intermediate storage, handling and treatment methods for ordinary or inert waste ➤ Storage and handling methods for dangerous waste
16.	Clearing and revegetation	<ul style="list-style-type: none"> ➤ Methods & schedule for clearing vegetation and earthwork activities ➤ Methods, species and schedule for the revegetation of Project Areas disturbed by the Works
17.	Biodiversity	<ul style="list-style-type: none"> ➤ Schedule for adequate fauna and flora management ➤ Measures for minimizing impact on fauna and flora species based on the Contracting Authority procedures ➤ Measures for monitoring the efficiency and performance of the plan in place ➤ Measures for limiting IAS ➤ Measures for monitoring the efficiency and performance of the plan in place
18.	Prevention of erosion	<ul style="list-style-type: none"> ➤ Location of zones suffering from erosion ➤ Methods and schedule for the implementation of anti-erosive actions, including topsoil storage
19.	Documentation on the Project Area condition	<ul style="list-style-type: none"> ➤ List and cover of viewpoints ➤ Imaging method ➤ Archiving photographs
20.	Rehabilitation	<ul style="list-style-type: none"> ➤ Method and schedule for Project Area rehabilitation
21.	Appendices	<ul style="list-style-type: none"> ➤ Environment Protection Plans (number and location specified in Section 6 "Project Areas" above): <ul style="list-style-type: none"> – Marking out of the Project Area perimeter on a map – Definition of zones for vegetation clearing, zones for the storage of usable timber, zones for burning of green waste – Definition of on-site activities: construction, storage areas, accommodation areas, offices, workshops, concrete making units – Layout of activity areas on the Project Area: construction works, production/operation areas, rehabilitation and closure – Zones for the storage of topsoil, spoil from earthworks, materials – Access routes and checkpoints – Project Area occupancy schedule – Organization of Project Area preparation – Liquid discharge outlet points – Proposed sampling points for monitoring water quality – Atmospheric emission outlet points – Location of the storage site for dangerous products – Location and mapping of waste treatment facilities when handled by an external service provider – Any other information relating to the environmental management of the Project Area ➤ Emergency plan: <ul style="list-style-type: none"> – Description of facilities – Characterization of hazards – Emergency situations – Organization structure - roles and responsibilities – Emergency procedures – Human and material resources

		<ul style="list-style-type: none">- Triggering of the plan- Reporting➤ Bailiff's sworn reports as specified in Sub-Clauses 10.5, 42.4 and 44.5 of the ESHS Specifications.
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PROPERTIES RENDERING A PRODUCT DANGEROUS¹

1.	Explosive	substances and preparations which could explode in the presence of a flame or which are more sensitive to impacts and friction than dinitrobenzene.
2.	Combustive	substances and preparations which, when in contact with other substances, particularly inflammable substances, undergo strongly exothermic reactions.
3.	Easily inflammable	substances and preparations (i) in liquid phase (including extremely inflammable liquids), with a flash point below 21°C, or which can heat up to the extent of spontaneous combustion in ambient air; or (ii) in solid phase, which can burst into flames easily in the brief presence of a source of inflammation and which will continue to burn after the removal of the source of inflammation or (iii) in gaseous phase, which are inflammable in air at normal pressure; or (iv) - which, when in contact with moist air or water, produce dangerous quantities of gases which are easily inflammable.
4.	Inflammable	liquid substances and preparations, with a flash point equal to or above 21°C and less than or equal to 55°C.
5.	Irritant	non-corrosive substances and preparations which, when in immediate, extended or repeated contact with the skin and mucosa, can cause inflammation.
6.	Harmful	substances and preparations which, in case of inhaling, swallowing or cutaneous penetration, can lead to risks of limited severity.
7.	Toxic	substances and preparations (including highly toxic substances and preparations), which, in case of inhaling, swallowing or cutaneous penetration, can lead to serious, acute or chronic risks, and even death.
8.	Carcinogenic	substances and preparations which, in case of inhaling, swallowing or cutaneous penetration, can lead to or increase the frequency of cancer.
9.	Corrosive	substances and preparations which, in case of contact with living tissues, can destroy the latter.
10.	Infectious	substances containing viable micro-organisms or their toxins, for which it is known or we have good reasons to believe that they cause disease in humans or other living organisms.
11.	Harmful to reproduction function	substances and preparations which, in case of inhaling, swallowing or cutaneous penetration, can induce or increase the frequency of undesirable non-hereditary effects in offspring or have a negative effect on reproductive functions and abilities.
12.	Mutagenic	substances and preparations which, in case of inhaling, swallowing or cutaneous penetration, can lead to hereditary genetic disorders or increase the frequency of these disorders.
13.	React with water	substances and preparations which, in case of contact with water, air or an acid, release a toxic or highly toxic gas.
14.	Sensitizing	substances and preparations which, in case of inhaling or cutaneous penetration, can lead to a hyper-sensitization, so that renewed exposure to the substance or preparation will cause characteristic harmful effects. This property can only be considered if test methods are available.
15.	Ecotoxic	substances and preparations with inherent or potential immediate or deferred risks for one or several environmental components.
16.	Dangerous for the environment	substances and preparations which are likely, after elimination, to lead to another substance, by any means, e.g. a lixiviation product, with one of the above characteristics.

¹ Source: French Environment Law (*Code de l'environnement*) / Articles R541-8

PART 3 - Conditions of Contract (CC) and Contracts Forms

Section VIII – General Conditions (GC)

Employer: Assam Project on Forest and Biodiversity Conservation (APFBC) Society

Contract for: Construction of Aranya Bhawan Annex Building at Panjabari, Guwahati

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1 General Provisions

- 1.1 Definitions In the Conditions of Contract ("these Conditions"), which include Particular Conditions, Parts A and B, and these General Conditions, the following words and expressions shall have the meanings stated. Words indicating persons or parties include corporations and other legal entities, except where the context requires otherwise.
- 1.1.1 The Contract
- 1.1.1.1 "**Contract**" means the Contract Agreement, the Letter of Acceptance, the Letter of Tender, these Conditions, the Specification, the Drawings, the Schedules, and the further documents (if any) which are listed in the Contract Agreement or in the Letter of Acceptance.
- 1.1.1.2 "**Contract Agreement**" means the contract agreement referred to in Sub-Clause 1.6 [*Contract Agreement*].
- 1.1.1.3 "**Letter of Acceptance**" means the letter of formal acceptance, signed by the Employer, of the Letter of Tender, including any annexed memoranda comprising agreements between and signed by both Parties. If there is no such letter of acceptance, the expression "Letter of Acceptance" means the Contract Agreement and the date of issuing or receiving the Letter of Acceptance means the date of signing the Contract Agreement.
- 1.1.1.4 "**Letter of Tender**" means the document entitled letter of tender or letter of bid, which was completed by the Contractor and includes the signed offer to the Employer for the Works.
- 1.1.1.5 "**Specification**" means the document entitled specification, as included in the Contract, and any additions and modifications to the specification in accordance with the Contract. Such document specifies the Works.
- 1.1.1.6 "**Drawings**" means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Employer in accordance with the Contract.
- 1.1.1.7 "**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.
- 1.1.1.8 "**Tender**" means the Letter of Tender and all other documents which the Contractor submitted with the Letter of Tender, as included in the Contract.
- 1.1.1.9 "**Bill of Quantities**", "**Daywork Schedule**" and "**Schedule of Payment Currencies**" mean the documents so named (if any) which are comprised in the Schedules.
- 1.1.1.10 "**Contract Data**" means the pages completed by the Employer entitled contract data which constitute Part A of the Particular Conditions.
- 1.1.2 Parties and Persons
- 1.1.2.1 "**Party**" means the Employer or the Contractor, as the context requires.
- 1.1.2.2 "**Employer**" means the person named as employer in the Contract Data and the legal successors in title to this person.
- 1.1.2.3 "**Contractor**" means the person(s) named as contractor in the Letter of Tender accepted by the Employer and the legal successors in title to this person(s).
- 1.1.2.4 "**Engineer**" means the person appointed by the Employer to act as the Engineer for the purposes of the Contract and named in the Contract Data, or other person appointed from time to time by the Employer and notified to the Contractor under Sub-Clause 3.4 [*Replacement of the Engineer*].
- 1.1.2.5 "**Contractor's Representative**" means the person named by the Contractor in the Contract or appointed from time to time by the Contractor under Sub-Clause 4.3 [*Contractor's Representative*], who acts on behalf of the Contractor.
- 1.1.2.6 "**Employer's Personnel**" means the Engineer, the assistants referred

to in Sub-Clause 3.2 [*Delegation by the Engineer*] and all other staff, labour and other employees of the Engineer and of the Employer; and any other personnel notified to the Contractor, by the Employer or the Engineer, as Employer's Personnel.

- 1.1.2.7 "**Contractor's Personnel**" means the Contractor's Representative and all personnel whom the Contractor utilises on Site, who may include the staff, labour and other employees of the Contractor and of each Subcontractor; and any other personnel assisting the Contractor in the execution of the Works.
- 1.1.2.8 "**Subcontractor**" means any person named in the Contract as a subcontractor, or any person appointed as a subcontractor, for a part of the Works; and the legal successors in title to each of these persons.
- 1.1.2.9 "**DB**" means the person or three persons appointed under Sub-Clause 20.2 [*Appointment of the Dispute Board*] or Sub-Clause 20.3 [*Failure to Agree on the Composition of the Dispute Board*].
- 1.1.2.10 "**FIDIC**" means the *Fédération Internationale des Ingénieurs-Conseils*, the international federation of consulting engineers.
- 1.1.2.11 "**Bank**" means the financing institution (if any) named in the Contract Data.
- 1.1.2.12 "**Borrower**" means the person (if any) named as the borrower in the Contract Data.
- 1.1.3 Dates, Tests, Periods and Completion
- 1.1.3.1 "**Base Date**" means the date 28 days prior to the latest date for submission of the Tender.
- 1.1.3.2 "**Commencement Date**" means the date notified under Sub-Clause 8.1 [*Commencement of Works*].
- 1.1.3.3 "**Time of Completion**" means the time for completing the Works or a Section (as the case may be) under Sub-Clause 8.2 [*Time for Completion*], as stated in the Contract Data (with any extension under Sub-Clause 8.4 [*Extension of Time for Completion*]), calculated from the Commencement Date.
- 1.1.3.4 "**Tests on Completion**" means the tests which are specified in the Contract or agreed by both Parties or instructed as a Variation, and which are carried out under Clause 9 [*Tests on Completion*] before the Works or a Section (as the case may be) are taken over by the Employer.
- 1.1.3.5 "**Taking-Over Certificate**" means a certificate issued under Clause 10 [*Employer's Taking Over*].
- 1.1.3.6 "**Test after Completion**" means the tests (if any) which are specified in the Contract and which are carried out in accordance with the Specification after the Works or a Section (as the case may be) are taken over by the Employer.
- 1.1.3.7 "**Defects Notification Period**" means the period for notifying defects in the Works or a Section (as the case may be) under Sub-Clause 11.1 [*Completion of Outstanding Work and Remedying Defects*], which extends over 365 days except if otherwise stated in the Contract Data (with any extension under Sub-Clause 11.3 [*Extension of Defects Notification Period*]), calculated from the date on which the Works or Section is completed as certified under Sub-Clause 10.1 [*Taking Over of the Works and Sections*].
- 1.1.3.8 "**Performance Certificate**" means the certificate issued under Sub-Clause 11.9 [*Performance Certificate*].
- 1.1.3.9 "**Day**" means a calendar day and "**year**" means 365 days.
- 1.1.4 Money and Payments
- 1.1.4.1 "**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.
- 1.1.4.2 "**Contract Price**" means the price defined in Sub-Clause 14.1 [*The Contract Price*], and includes adjustments in accordance with the

Contract.

- 1.1.4.3 "**Cost**" means all expenditure reasonably incurred (or to be incurred) by the Contractor, whether on or off the Site, including overhead and similar charges, but does not include profit.
- 1.1.4.4 "**Final Payment Certificate**" means the payment certificate issued under Sub-Clause 14.13 [*Issue of Final Payment Certificate*].
- 1.1.4.5 "**Final Statement**" means the statement defined in Sub-Clause 14.11 [*Application for Final Payment Certificate*].
- 1.1.4.6 "**Foreign Currency**" means a currency in which part (or all) of the Contract Price is payable, but not the Local Currency.
- 1.1.4.7 "**Interim Payment Certificate**" means a payment certificate issued under Clause 14 [*Contract Price and Payment*].
- 1.1.4.8 "**Local Currency**" means the currency of the Country.
- 1.1.4.9 "**Payment Certificate**" means a payment certificate issued under Clause 14 [*Contract Price and Payment*].
- 1.1.4.10 "**Provisional Sum**" means a sum (if any) which is specified in the Contract as a provisional sum, for the execution of any part of the Works or for the supply of Plant, Materials or services under Sub-Clause 13.5 [*Provisional Sums*].
- 1.1.4.11 "**Retention Money**" means the accumulated retention moneys which the Employer retains under Sub-Clause 14.3 [*Application for Interim Payment Certificates*] and pays under Sub-Clause 14.9 [*Payment of Retention Money*].
- 1.1.4.12 "**Statement**" means a statement submitted by the Contractor as part of an application, under Clause 14 [*Contract Price and Payment*], for a payment certificate.
- 1.1.5 Works and Goods
 - 1.1.5.1 "**Contractor's Equipment**" means all apparatus, machinery, vehicles and other things required for the execution and completion of the Works and the remedying of any defects. However, Contractor's Equipment excludes Temporary Works, Employer's Equipment (if any), Plant, Materials and any other things intended to form or forming part of the Permanent Works.
 - 1.1.5.2 "**Goods**" means Contractor's Equipment, Materials, Plant and Temporary Works, or any of them as appropriate.
 - 1.1.5.3 "**Materials**" means things of all kinds (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.
 - 1.1.5.4 "**Permanent Works**" means the permanent works to be executed by the Contractor under the Contract.
 - 1.1.5.5 "**Plant**" means the apparatus, machinery and other equipment intended to form or forming part of the Permanent Works, including vehicles purchased for the Employer and relating to the construction or operation of the Works.
 - 1.1.5.6 "**Section**" means a part of the Works specified in the Contract Data as a Section (if any).
 - 1.1.5.7 "**Temporary Works**" means all temporary works of every kind (other than Contractor's Equipment) required on Site for the execution and completion of the Permanent Works and the remedying of any defects.
 - 1.1.5.8 "**Works**" mean the Permanent Works and the Temporary Works, or either of them as appropriate.
- 1.1.6 Other Definitions
 - 1.1.6.1 "**Contractor's Documents**" means the calculations, computer programs and other software, drawings, manuals, models and other documents of a technical nature (if any) supplied by the Contractor under the Contract.
 - 1.1.6.2 "**Country**" means the country in which the Site (or most of it) is

located, where the Permanent Works are to be executed.

- 1.1.6.3 "**Employer's Equipment**" means the apparatus, machinery and vehicles (if any) made available by the Employer for the use of the Contractor in the execution of the Works, as stated in the Specification; but does not include Plant which has not been taken over by the Employer.
- 1.1.6.4 "**Force Majeure**" is defined in Clause 19 [*Force Majeure*].
- 1.1.6.5 "**Laws**" means all national (or state) legislation, statutes, ordinances and other laws, and regulations and by-laws of any legally constituted public authority.
- 1.1.6.6 "**Performance Security**" (means the security (or securities, if any) under Sub-Clause 4.2 [*Performance Security*]).
- 1.1.6.7 "**Site**" means the places where the Permanent Works are to be executed, including storage and working areas, and to which Plant and Materials are to be delivered, and any other places as may be specified in the Contract as forming part of the Site.
- 1.1.6.8 "**Unforeseeable**" means not reasonably foreseeable by an experienced contractor by the Base Date.
- 1.1.6.9 "**Variation**" means any change to the Works, which is instructed or approved as a variation under Clause 13 [*Variations and Adjustments*].
- 1.1.6.10 "**Notice of Dissatisfaction**" means the notice given by either Party to the other under Sub-Clause 20.4 [*Obtaining Dispute Board's Decision*] indicating its dissatisfaction and intention to commence arbitration.

1.2 Interpretation

In the Contract, except where the context requires otherwise:

- a) Words indicating one gender include all genders;
- b) Words indicating the singular also include the plural and words indicating the plural also include the singular;
- c) Provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing;
- d) "Written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record; and
- e) The word "tender" is synonymous with "bid" and "tenderer" with "Bidder" and the words "tender documents" with "bidding documents".

The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

In these Conditions, provisions including the expression "Cost plus profit" require this profit to be one-twentieth (5%) of this Cost unless otherwise indicated in the Contract Data.

1.3 Communications

Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests and discharges, these communications shall be:

- a) In writing and delivered by hand (against receipt), sent by mail or courier, or transmitted using any of the agreed systems of electronic transmission as stated in the Contract Data; and
- b) Delivered, sent or transmitted to the address for the recipient's communications as stated in the Contract Data. However:
 - (i) If the recipient gives notice of another address, communications shall thereafter be delivered accordingly; and
 - (ii) If the recipient has not stated otherwise when requesting an approval or consent, it may be sent to the address from which the request was issued.

Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed. When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other

- Party or the Engineer, a copy shall be sent to the Engineer or the other Party, as the case may be.
- 1.4 Law and Language The Contract shall be governed by the law of the country or other jurisdiction stated in the Contract Data.
The ruling language of the Contract shall be that stated in the Contract Data.
The language for communications shall be that stated in the Contract Data. If no language is stated there, the language for communications shall be the ruling language of the Contract.
- 1.5 Priority of Documents The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence:
- a) The Contract Agreement (if any);
 - b) The Letter of Acceptance;
 - c) The Letter of Tender;
 - d) The Particular Conditions – Part A;
 - e) The Particular Conditions – Part B;
 - f) These General Conditions;
 - g) The Specification;
 - h) The Drawings; and
 - i) The Schedules and any other documents forming part of the Contract.
- If an ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction.
- 1.6 Contract Agreement 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 form annexed to the Particular Conditions. 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.
- 1.7 Assignment 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 favour of a bank or financial institution, assign its right to any moneys due, or to become due, under the Contract.
- 1.8 Care and Supply of Documents 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.
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.
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.
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.
- 1.9 Delayed Drawings or Instructions The Contractor shall give notice to the Engineer whenever the Works are likely to be delayed or disrupted if any necessary drawing or instruction is not issued to the Contractor within a particular time, which shall be reasonable. The notice shall include details of the necessary drawing or instruction, details of why and by when it should be issued, and the nature and amount of the delay or disruption likely to be suffered if it is late.

If the Contractor suffers delay and/or incurs Cost as a result of a failure of the Engineer to issue the notified drawing or instruction within a time which is reasonable and is specified in the notice with supporting details, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*]; and
- b) Payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

However, if and to the extent that the Engineer's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, Cost or profit.

1.10 Employer's Use of Contractor's Documents

As between the Parties, the Contractor shall retain the copyright and other intellectual property rights in the Contractor's Documents and other design documents made by (or on behalf of) the Contractor.

The Contractor shall be deemed (by signing the Contract) to give to the Employer a non-terminable transferable non-exclusive royalty-free licence to copy, use and communicate the Contractor's Documents, including making and using modifications of them. This licence shall:

- a) Apply throughout the actual or intended working life (whichever is longer) of the relevant parts of the Works;
- b) Entitle any person in proper possession of the relevant part of the Works to copy, use and communicate the Contractor's Documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works; and
- c) In the case of Contractor's Documents which are in the form of computer programs and other software, permit their use on any computer on the Site and other places as envisaged by the Contract, including replacements of any computers supplied by the Contractor.

The Contractor's Documents and other design documents made by (or on behalf of) the Contractor shall not, without the Contractor's consent, be used, copied or communicated to a third party by (or on behalf of) the Employer for purposes other than those permitted under this Sub-Clause.

1.11 Contractor's Use of Employer's Documents

As between the Parties, the Employer shall retain the copyright and other intellectual property rights in the Specification, the Drawings and other documents made by (or on behalf of) the Employer. The Contractor may, at his cost, copy, use, and obtain communication of these documents for the purposes of the Contract.

They shall not, without the Employer's consent, be copied, used or communicated to a third party by the Contractor, except as necessary for the purposes of the Contract.

1.12 Confidential Details

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 compliance with the Contract and allow its proper implementation.

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.

1.13 Compliance with Laws

The Contractor shall, in performing the Contract, comply with applicable Laws. Unless otherwise stated in the Particular Conditions:

- a) The Employer shall have obtained (or shall obtain) the planning, zoning, building permit or similar permission for the Permanent

Works, and any other permissions described in the Specification as having been (or to be) obtained by the Employer; and the Employer shall indemnify and hold the Contractor harmless against and from the consequences of any failure to do so; and

- b) The Contractor shall give all notices, pay all taxes, duties and fees, and obtain all permits, licences and approvals, as required by the Laws in relation to the execution and completion of the Works and the remedying of any defects; and the Contractor shall indemnify and hold the Employer harmless against and from the consequences of any failure to do so, unless the Contractor is impeded to accomplish these actions and shows evidence of its diligence.

1.14 Joint and Several Liability

If the Contractor constitutes (under applicable Laws) a joint venture, consortium or other unincorporated grouping of two or more persons:

- a) These persons shall be deemed to be jointly and severally liable to the Employer for the performance of the Contract;
- b) These persons shall notify the Employer of their leader who shall have authority to bind the Contractor and each of these persons; and
- c) The Contractor shall not alter its composition or legal status without the prior consent of the Employer.

1.15 Inspections and Audit by the Bank

The Contractor shall permit the Bank and/or persons appointed by the Bank to inspect the Site and/or the Contractor's accounts and records relating to the performance of the Contract and to have such accounts and records audited by auditors appointed by the Bank if required by the Bank.

2 The Employer

2.1 Right of Access to the Site

The Employer shall give the Contractor right of access to, and possession of, all parts of the Site within the time (or times) stated in the Contract Data. The right and possession may not be exclusive to the Contractor. If, under the Contract, the Employer is required to give (to the Contractor) possession of any foundation, structure, plant or means of access, the Employer shall do so in the time and manner stated in the Specification. However, the Employer may withhold any such right or possession until the Performance Security has been received.

If no such time is stated in the Contract Data, the Employer shall give the Contractor right of access to, and possession of, the Site within such times as required to enable the Contractor to proceed without disruption in accordance with the programme submitted under Sub-Clause 8.3 [Programme].

If the Contractor suffers delay and/or incurs Cost as a result of a failure by the Employer to give any such right or possession within such time, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion]; and
- b) Payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

However, if and to the extent that the Employer's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, Cost or profit.

2.2 Permits, Licences or Approval

The Employer shall provide, at the request of the Contractor, such reasonable assistance as to allow the Contractor to obtain properly:

- a) Copies of the Laws of the Country which are relevant to the Contract but are not readily available, and
- b) Any permits, licences or approvals required by the Laws of the Country:
 - (i) Which the Contractor is required to obtain under Sub-Clause 1.13 [Compliance with Laws];

- (ii) For the delivery of Goods, including clearance through customs; and
- (iii) For the export of Contractor's Equipment when it is removed from the Site.

2.3 Employer's Personnel The Employer shall be responsible for ensuring that the Employer's Personnel and the Employer's other contractors on the Site:

- a) Co-operate with the Contractor's efforts under Sub-Clause 4.6 [*Co-operation*]; and
- b) Take actions similar to those which the Contractor is required to take under sub-paragraphs (a), (b) and (c) of Sub-Clause 4.8 [*Safety Procedures*] and under Sub-Clause 4.18 [*Protection of the Environment*].

2.4 Employer's Financial Arrangements The Employer shall submit, before the Commencement Date and thereafter within 28 days after receiving any request from the Contractor, reasonable evidence that financial arrangements have been made and are being maintained which will enable the Employer to pay the Contract Price punctually (as estimated at that time) in accordance with Clause 14 [*Contract Price and Payment*]. Before the Employer makes any material change to his financial arrangements, the Employer shall give notice to the Contractor with detailed particulars.

In addition, if the Bank has notified to the Borrower that the Bank has suspended disbursements under its loan, which finances in whole or in part the execution of the Works, the Employer shall give notice of such suspension to the Contractor with detailed particulars, including the date of such notification, with a copy to the Engineer, within 7 days of the Borrower having received the suspension notification from the Bank. If alternative funds will be available in appropriate currencies to the Employer to continue making payments to the Contractor beyond a date 60 days after the date of Bank notification of the suspension, the Employer shall provide reasonable evidence in his notice of the extent to which such funds will be available.

2.5 Employer's Claims If the Employer considers himself to be entitled to any payment under any Clause of these Conditions or otherwise in connection with the Contract, and/or to any extension of the Defects Notification Period, the Employer or the Engineer shall give notice and particulars to the Contractor. However, notice is not required for payments due under Sub-Clause 4.19 [*Electricity, Water and Gas*], under Sub-Clause 4.20 [*Employer's Equipment and Free-Issue Materials*], or for other services requested by the Contractor.

The notice shall be given as soon as practicable and no longer than 28 days after the Employer became aware, or should have become aware, of the event or circumstances giving rise to the claim. A notice relating to any extension of the Defects Notification Period shall be given before the expiry of such period.

The particulars shall specify the Clause or other basis of the claim, and shall include substantiation of the amount and/or extension to which the Employer considers himself to be entitled in connection with the Contract. The Engineer shall then proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine (i) the amount (if any) which the Employer is entitled to be paid by the Contractor, and/or (ii) the extension (if any) of the Defects Notification Period in accordance with Sub-Clause 11.3 [*Extension of Defects Notification Period*].

This amount may be included as a deduction in the Contract Price and Payment Certificates. The Employer shall only be entitled to set off against or make any deduction from an amount certified in a Payment Certificate, or to otherwise claim against the Contractor, in accordance with this Sub-Clause.

3 The Engineer

3.1 Engineer's Duties and Authority The Employer shall appoint the Engineer who shall carry out the duties assigned to him in the Contract. The Engineer's staff shall include suitably qualified engineers and other professionals who are competent to carry out these duties.

The Engineer shall have no authority to amend the Contract.

The Engineer may exercise the authority attributable to the Engineer as specified in or necessarily to be implied from the Contract. If the Engineer is

required to obtain the approval of the Employer before exercising a specified authority, the requirements shall be as stated in the Particular Conditions. The Employer shall promptly inform the Contractor of any change to the authority attributed to the Engineer.

However, whenever the Engineer exercises a specified authority for which the Employer's approval is required, then (for the purposes of the Contract) the Employer shall be deemed to have given approval.

Except as otherwise stated in these Conditions:

- a) Whenever carrying out duties or exercising authority, specified in or implied by the Contract, the Engineer shall be deemed to act for the Employer;
- b) The Engineer has no authority to relieve either Party of any duties, obligations or responsibilities under the Contract;
- c) Any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by the Engineer (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, including responsibility for errors, omissions, discrepancies and non-compliances; and
- d) Any act by the Engineer in response to a Contractor's request except as otherwise expressly specified shall be notified in writing to the Contractor within 28 days of receipt.

The following provisions shall apply:

The Engineer shall obtain the specific approval of the Employer before taking action under the following Sub-Clauses of these Conditions:

- a) Sub-Clause 4.12: agreeing or determining an extension of time and/or additional cost;
- b) Sub-Clause 13.1: instructing a Variation, except;
 - (i) In an emergency situation as determined by the Engineer, or
 - (ii) If such a Variation would increase the Accepted Contract Amount by less than the percentage specified in the Contract Data;
- c) Sub-Clause 13.3: Approving a proposal for Variation submitted by the Contractor in accordance with Sub Clause 13.1 or 13.2;
- d) Sub-Clause 13.4: Specifying the amount payable in each of the applicable currencies.

Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibility under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 13 and shall notify the Contractor accordingly, with a copy to the Employer.

3.2 Delegation by the Engineer

The Engineer may from time to time assign duties and delegate authority to assistants, and may also revoke such assignment or delegation. These assistants may include a resident engineer, and/or independent inspectors appointed to inspect and/or test items of Plant and/or Materials. The assignment, delegation or revocation shall be in writing and shall not take effect until copies have been received by both Parties. However, unless otherwise agreed by both Parties, the Engineer shall not delegate the authority to determine any matter in accordance with Sub-Clause 3.5 [*Determinations*].

Each assistant, to whom duties have been assigned or authority has been delegated, shall only be authorised to issue instructions to the Contractor to the extent defined by the delegation. Any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by an assistant, in accordance with the delegation, shall have the same

effect as though the act had been an act of the Engineer. However:

- a) Any failure to disapprove any work, Plant or Materials shall not constitute approval, and shall therefore not prejudice the right of the Engineer to reject the work, Plant or Materials;
- b) If the Contractor questions any determination or instruction of an assistant, the Contractor may refer the matter to the Engineer, who shall promptly confirm, reverse or vary the determination or instruction.

3.3 Instructions of the Engineer

The Engineer may issue to the Contractor (at any time) instructions and additional or modified Drawings which may be necessary for the execution of the Works and the remedying of any defects, all in accordance with the Contract. The Contractor shall only take instructions from the Engineer, or from an assistant to whom the appropriate authority has been delegated under this Clause. If an instruction constitutes a Variation, Clause 13 [*Variations and Adjustments*] shall apply.

The Contractor shall comply with the instructions given by the Engineer or delegated assistant, on any matter related to the Contract. Whenever practicable, their instructions shall be given in writing. If the Engineer or a delegated assistant:

- a) Gives an oral instruction;
- b) Receives a written confirmation of the instruction, from (or on behalf of) the Contractor, within two working days after giving the instruction; and
- c) Does not reply by issuing a written rejection and/or instruction within two working days after receiving the confirmation;

then the confirmation shall constitute the written instruction of the Engineer or delegated assistant (as the case may be).

3.4 Replacement of the Engineer

If the Employer intends to replace the Engineer, the Employer shall, not less than 21 days before the intended date of replacement, give notice to the Contractor of the name, address and relevant experience of the intended replacement Engineer. If the Contractor considers the intended replacement Engineer to be unsuitable, he has the right to raise objection against him by notice to the Employer, with supporting particulars, and the Employer shall give full and fair consideration to this objection.

3.5 Determinations

Whenever these Conditions provide that the Engineer shall proceed in accordance with this Sub-Clause 3.5 to agree or determine any matter, the Engineer shall consult with each Party in an endeavour to reach agreement. If agreement is not achieved, the Engineer shall make a fair determination in accordance with the Contract, taking due regard of all relevant circumstances.

The Engineer shall give notice to both Parties of each agreement or determination, with supporting particulars, within 28 days from the receipt of the corresponding claim or request except when otherwise specified. Each Party shall give effect to each agreement or determination unless and until revised under Clause 20 [*Claims, Disputes and Arbitration*].

4 The Contractor

4.1 Contractor's General Obligations

The Contractor shall design (to the extent specified in the Contract), execute and complete the Works in accordance with the Contract and with the Engineer's instructions, and shall remedy any defects in the Works.

The Contractor shall provide the Plant and Contractor's Documents specified in the Contract, and all Contractor's Personnel, Goods, consumables and other things and services, whether of a temporary or permanent nature, required in and for this design, execution, completion and remedying of defects.

All equipment, material, and services to be incorporated in or required for the Works shall have their origin in any eligible source country as defined by the Bank.

The Contractor shall be responsible for the adequacy, stability and safety of all Site operations and of all methods of construction. Except to the extent specified in the Contract, the Contractor (i) shall be responsible for all Contractor's Documents, Temporary Works, and such design of each item of

Plant and Materials as is required for the item to be in accordance with the Contract, and (ii) shall not otherwise be responsible for the design or specification of the Permanent Works.

The Contractor shall, whenever required by the Engineer, submit details of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works. No significant alteration to these arrangements and methods shall be made without this having previously been notified to the Engineer.

If the Contract specifies that the Contractor shall design any part of the Permanent Works, then unless otherwise stated in the Particular Conditions:

- a) The Contractor shall submit to the Engineer the Contractor's Documents for this part in accordance with the procedures specified in the Contract;
- b) These Contractor's Documents shall be in accordance with the Specification and Drawings, shall be written in the language for communications defined in Sub-Clause 1.4 [*Law and Language*], and shall include additional information required by the Engineer to add to the Drawings for co-ordination of each Party's designs;
- c) The Contractor shall be responsible for this part and it shall, when the Works are completed, be fit for such purposes for which the part is intended as are specified in the Contract; and
- d) Prior to the commencement of the Tests on Completion, the Contractor shall submit to the Engineer the "as-built" documents and, if applicable, operation and maintenance manuals in accordance with the Specification and in sufficient detail for the Employer to operate, maintain, dismantle, reassemble, adjust and repair this part of the Works. Such part shall not be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [*Taking Over of the Works and Sections*] until these documents and manuals have been submitted to the Engineer.

4.2 Performance Security

The Contractor shall obtain (at his cost) a Performance Security for proper performance, in the amount stated in the Contract Data and denominated in the currency(ies) of the Contract or in a freely convertible currency acceptable to the Employer. If an amount is not stated in the Contract Data, this Sub-Clause shall not apply.

The Contractor shall deliver the Performance Security to the Employer within 28 days after receiving the Letter of Acceptance, and shall send a copy to the Engineer. The Performance Security shall be issued by a reputable bank or financial institution selected by the Contractor, and shall be in the form annexed to the Particular Conditions, as stipulated by the Employer in the Contract Data, or in another form approved by the Employer.

The Contractor shall ensure that the Performance Security is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects. If the terms of the Performance Security specify its expiry date, and the Contractor has not become entitled to receive the Performance Certificate by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the Performance Security until the Works have been completed and any defects have been remedied.

The Employer shall not make a claim under the Performance Security, except for amounts to which the Employer is entitled under the Contract.

The Employer shall indemnify and hold the Contractor harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the Performance Security to the extent to which the Employer was not entitled to make the claim.

The Employer shall return the Performance Security to the Contractor within 21 days after receiving a copy of the Performance Certificate.

Without limitation to the provisions of the rest of this Sub-Clause, whenever the Engineer determines an addition or a reduction to the Contract Price as a result of a change in cost and/or legislation, or as a result of a Variation, amounting to more than 25 percent of the portion of the Contract Price

payable in a specific currency, the Contractor shall at the Engineer's request promptly increase, or may decrease, as the case may be, the value of the Performance Security in that currency by an equal percentage.

4.3 Contractor's Representative

The Contractor shall appoint the Contractor's Representative and shall give him all authority necessary to act on the Contractor's behalf under the Contract.

Unless the Contractor's Representative is named in the Contract, the Contractor shall, prior to the Commencement Date, submit to the Engineer for consent the name and particulars of the person the Contractor proposes to appoint as Contractor's Representative. If consent is withheld or subsequently revoked in terms of Sub-Clause 6.9 [*Contractor's Personnel*], or if the appointed person fails to act as Contractor's Representative, the Contractor shall similarly submit the name and particulars of another suitable person for such appointment.

The Contractor shall not, without the prior consent of the Engineer, revoke the appointment of the Contractor's Representative or appoint a replacement.

The whole time of the Contractor's Representative shall be given to directing the Contractor's performance of the Contract. If the Contractor's Representative is to be temporarily absent from the Site during the execution of the Works, a suitable replacement person shall be appointed, subject to the Engineer's prior consent, and the Engineer shall be notified accordingly.

The Contractor's Representative shall, on behalf of the Contractor, receive instructions under Sub-Clause 3.3 [*Instructions of the Engineer*].

The Contractor's Representative may delegate any powers, functions and authority to any competent person, and may at any time revoke the delegation. Any delegation or revocation shall not take effect until the Engineer has received prior notice signed by the Contractor's Representative, naming the person and specifying the powers, functions and authority being delegated or revoked.

The Contractor's Representative shall be fluent in the language for communications defined in Sub-Clause 1.4 [*Law and Language*]. If the Contractor's Representative's delegates are not fluent in the said language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer.

4.4 Subcontractors

The Contractor shall not subcontract the whole of the Works.

The Contractor shall be responsible for the acts or defaults of any Subcontractor, his agents or employees, as if they were the acts or defaults of the Contractor. Unless otherwise stated in the Particular Conditions:

- a) The Contractor shall not be required to obtain consent to suppliers solely of Materials, or to a subcontract for which the Subcontractor is named in the Contract;
- b) The prior consent of the Engineer shall be obtained to other proposed Subcontractors;
- c) The Contractor shall give the Engineer not less than 28 days' notice of the intended date of the commencement of each Subcontractor's work, and of the commencement of such work on the Site; and
- d) Each subcontract shall include provisions which would entitle the Employer to require the subcontract to be assigned to the Employer under Sub-Clause 4.5 [*Assignment of Benefit of Subcontract*] (if or when applicable) or in the event of termination under Sub-Clause 15.2 [*Termination by Employer*].

The Contractor shall ensure that the requirements imposed on the Contractor by Sub-Clause 1.12 [*Confidential Details*] apply equally to each Subcontractor.

Where practicable, the Contractor shall give fair and reasonable opportunity for contractors from the Country to be appointed as Subcontractors.

4.5 Assignment of Benefit of Subcontractor

If a Subcontractor's obligations extend beyond the expiry date of the relevant Defects Notification Period and the Engineer, prior to this date, instructs the Contractor to assign the benefit of such obligations to the Employer, then the Contractor shall do so. Unless otherwise stated in the assignment, the

Contractor shall have no liability to the Employer for the work carried out by the Subcontractor after the assignment takes effect.

4.6 Co-operation

The Contractor shall, as specified in the Contract or as instructed by the Engineer, allow appropriate opportunities for carrying out work to:

- a) The Employer's Personnel;
- b) Any other contractors employed by the Employer; and
- c) The personnel of any legally constituted public authorities;

who may be employed in the execution on or near the Site of any work not included in the Contract.

Any such instruction shall constitute a Variation if and to the extent that it causes the Contractor to suffer delays and/or to incur Unforeseeable Cost. Services for these personnel and other contractors may include the use of Contractor's Equipment, Temporary Works or access arrangements which are the responsibility of the Contractor.

If, under the Contract, the Employer is required to give to the Contractor possession of any foundation, structure, plant or means of access in accordance with Contractor's Documents, the Contractor shall submit such documents to the Engineer in the time and manner stated in the Specification.

4.7 Setting Out

The Contractor shall set out the Works in relation to original points, lines and levels of reference specified in the Contract or notified by the Engineer. The Contractor shall be responsible for the correct positioning of all parts of the Works, and shall rectify any error in the positions, levels, dimensions or alignment of the Works.

The Employer shall be responsible for any errors in these specified or notified items of reference, but the Contractor shall use reasonable efforts to verify their accuracy before they are used.

If the Contractor suffers delay and/or incurs Cost from executing work which was necessitated by an error in these items of reference, and an experienced contractor could not reasonably have discovered such error and avoided this delay and/or Cost, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*]; and
- b) Payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine (i) whether and (if so) to what extent the error could not reasonably have been discovered, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this extent.

4.8 Safety Procedures

The Contractor shall:

- a) Comply with all applicable safety regulations;
- b) Take care for the safety of all persons entitled to be on the Site;
- c) Use reasonable efforts to keep the Site and Works clear of unnecessary obstruction so as to avoid danger to these persons;
- d) Provide fencing, lighting, guarding and watching of the Works until completion and taking over under Clause 10 [*Employer's Taking Over*]; and
- e) Provide any Temporary Works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the Works, for the use and protection of the public and of owners and occupiers of adjacent land.

4.9 Quality Assurance

The Contractor shall institute a quality assurance system to demonstrate compliance with the requirements of the Contract. The system shall be in accordance with the details stated in the Contract. The Engineer shall be entitled to audit any aspect of the system.

Details of all procedures and compliance documents shall be submitted to the Engineer for information before each design and execution stage is

commenced. When any document of a technical nature is issued to the Engineer, evidence of the prior approval by the Contractor himself shall be apparent on the document itself.

Compliance with the quality assurance system shall not relieve the Contractor of any of his duties, obligations or responsibilities under the Contract.

4.10 Site Data

The Employer shall have made available to the Contractor for his information, prior to the Base Date, all relevant data in the Employer's possession on sub-surface and hydrological conditions at the Site, including environmental aspects. The Employer shall similarly make available to the Contractor all such data which come into the Employer's possession after the Base Date. The Contractor shall be responsible for interpreting all such data.

To the extent which was practicable (taking account of cost and time), the Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Tender or Works. To the same extent, the Contractor shall be deemed to have inspected and examined the Site, its surroundings, the above data and other available information, and to have been satisfied before submitting the Tender as to all relevant matters, including (without limitation):

- a) The form and nature of the Site, including sub-surface conditions;
- b) The hydrological and climatic conditions;
- c) The extent and nature of the work and Goods necessary for the execution and completion of the Works and the remedying of any defects;
- d) The Laws, procedures and labour practices of the Country; and
- e) The Contractor's requirements for access, accommodation, facilities, personnel, power, transport, water and other services.

4.11 Sufficiency of the Accepted Contract Amount

The Contractor shall be deemed to:

- a) Have satisfied himself as to the correctness and sufficiency of the Accepted Contract Amount; and
- b) Have based the Accepted Contract Amount on the data, interpretations, necessary information, inspections, examinations and satisfaction as to all relevant matters referred to in Sub-Clause 4.10 *[Site Data]*.

Unless otherwise stated in the Contract, the Accepted Contract Amount covers all the Contractor's obligations under the Contract (including those under Provisional Sums, if any) and all things necessary for the proper execution and completion of the Works and the remedying of any defects.

4.12 Unforeseeable Physical Conditions

In this Sub-Clause, "physical conditions" means natural physical conditions and man-made and other physical obstructions and pollutants, which the Contractor encounters at the Site when executing the Works, including sub-surface and hydrological conditions but excluding climatic conditions.

If the Contractor encounters adverse physical conditions which he considers to have been Unforeseeable, the Contractor shall give notice to the Engineer as soon as practicable.

This notice shall describe the physical conditions, so that they can be inspected by the Engineer, and shall set out the reasons why the Contractor considers them to be Unforeseeable. The Contractor shall continue executing the Works, using such proper and reasonable measures as are appropriate for the physical conditions, and shall comply with any instructions which the Engineer may give. If an instruction constitutes a Variation, Clause 13 *[Variations and Adjustments]* shall apply.

If and to the extent that the Contractor encounters physical conditions which are Unforeseeable, gives such a notice, and suffers delay and/or incurs Cost due to these conditions, the Contractor shall be entitled subject to notice under Sub-Clause 20.1 *[Contractor's Claims]* to:

- a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 *[Extension of Time for Completion]*; and
- b) Payment of any such Cost, which shall be included in the Contract Price.

Upon receiving such notice and inspecting and/or investigating these physical conditions, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) whether and (if so) to what extent these physical conditions were Unforeseeable, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this extent.

However, before additional Cost is finally agreed or determined under sub-paragraph (ii), the Engineer may also review whether other physical conditions in similar parts of the Works (if any) were more favourable than could reasonably have been foreseen when the Contractor submitted the Tender. If and to the extent that these more favourable conditions were encountered, the Engineer may proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the reductions in Cost which were due to these conditions, which may be included (as deductions) in the Contract Price and Payment Certificates. However, the net effect of all adjustments under sub-paragraph (b) and all these reductions, for all the physical conditions encountered in similar parts of the Works, shall not result in a net reduction in the Contract Price.

The Engineer shall take account of any evidence of the physical conditions foreseen by the Contractor when submitting the Tender, which shall be made available by the Contractor, but shall not be bound by the Contractor's interpretation of any such evidence.

4.13 Rights of Way and Facilities

Unless otherwise specified in the Contract the Employer shall provide effective access to and possession of the Site including special and/or temporary rights-of-way which are necessary for the Works. The Contractor shall obtain, at his risk and cost, any additional rights of way or facilities outside the Site which he may require for the purposes of the Works.

4.14 Avoidance of Interference

The Contractor shall not interfere unnecessarily or improperly with:

- a) The convenience of the public; or
- b) The access to and use and occupation of all roads and footpaths, irrespective of whether they are public or in the possession of the Employer or of others.

The Contractor shall indemnify and hold the Employer harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from any such unnecessary or improper interference.

4.15 Access Route

The Contractor shall be deemed to have been satisfied as to the suitability and availability of access routes to the Site at Base Date. The Contractor shall use reasonable efforts to prevent any road or bridge from being damaged by the Contractor's traffic or by the Contractor's Personnel. These efforts shall include the proper use of appropriate vehicles and routes.

Except as otherwise stated in these Conditions:

- a) The Contractor shall (as between the Parties) be responsible for any maintenance which may be required for his use of access routes;
- b) The Contractor shall provide all necessary signs or directions along access routes, and shall obtain any permission which may be required from the relevant authorities for his use of routes, signs and directions;
- c) The Employer shall not be responsible for any claims which may arise from the use or otherwise of any access route;
- d) The Employer does not guarantee the suitability or availability of particular access routes; and
- e) Costs due to non-suitability or non-availability, for the use required by the Contractor, of access routes shall be borne by the Contractor.

4.16 Transport of Goods

Unless otherwise stated in the Particular Conditions:

- a) The Contractor shall give the Engineer not less than 21 days' notice of the date on which any Plant or a major item of other Goods will be delivered to the Site;
- b) The Contractor shall be responsible for packing, loading, transporting, receiving, unloading, storing and protecting all Goods and other things required for the Works; and

- c) The Contractor shall indemnify and hold the Employer harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from the transport of Goods, and shall negotiate and pay all claims arising from their transport.
- 4.17 Contractor's Equipment The Contractor shall be responsible for all Contractor's Equipment. When brought on to the Site, Contractor's Equipment shall be deemed to be exclusively intended for the execution of the Works. The Contractor shall not remove from the Site any major items of Contractor's Equipment without the consent of the Engineer. However, consent shall not be required for vehicles transporting Goods or Contractor's Personnel off Site.
- 4.18 Protection of Environment The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations. The Contractor shall ensure that emissions, surface discharges and effluent from the Contractor's activities shall not exceed the values stated in the Specification or prescribed by applicable Laws.
- 4.19 Electricity, Water and Gas The Contractor shall, except as stated below, be responsible for the provision of all power, water and other services he may require for his construction activities and to the extent defined in the Specifications, for the tests. The Contractor shall be entitled to use for the purposes of the Works such supplies of electricity, water, gas and other services as may be available on the Site and of which details and prices are given in the Specification. The Contractor shall, at his risk and cost, provide any apparatus necessary for his use of these services and for measuring the quantities consumed. The quantities consumed and the amounts due (at these prices) for such services shall be agreed or determined by the Engineer in accordance with Sub-Clause 2.5 *[Employer's Claims]* and Sub-Clause 3.5 *[Determinations]*. The Contractor shall pay these amounts to the Employer.
- 4.20 Employer's Equipment and Free-issues Materials The Employer shall make the Employer's Equipment (if any) available for the use of the Contractor in the execution of the Works in accordance with the details, arrangements and prices stated in the Specification. Unless otherwise stated in the Specification:
- a) The Employer shall be responsible for the Employer's Equipment; except that
- b) The Contractor shall be responsible for each item of Employer's Equipment whilst any of the Contractor's Personnel is operating it, driving it, directing it or in possession or control of it.
- The appropriate quantities and the amounts due (at such stated prices) for the use of Employer's Equipment shall be agreed or determined by the Engineer in accordance with Sub-Clause 2.5 *[Employer's Claims]* and Sub-Clause 3.5 *[Determinations]*. The Contractor shall pay these amounts to the Employer.
- The Employer shall supply, free of charge, the "free-issue materials" (if any) in accordance with the details stated in the Specification. The Employer shall, at his risk and cost, provide these materials at the time and place specified in the Contract. The Contractor shall then visually inspect them, and shall promptly give notice to the Engineer of any shortage, defect or default in these materials. Unless otherwise agreed by both Parties, the Employer shall immediately rectify the notified shortage, defect or default.
- After this visual inspection, the free-issue materials shall come under the care, custody and control of the Contractor. The Contractor's obligations of inspection, care, custody and control shall not relieve the Employer of liability for any shortage, defect or default not apparent from a visual inspection.
- 4.21 Progress Reports Unless otherwise stated in the Particular Conditions, monthly progress reports shall be prepared by the Contractor and submitted to the Engineer in six copies. The first report shall cover the period up to the end of the first calendar month following the Commencement Date. Reports shall be submitted monthly thereafter, each within 7 days after the last day of the period to which it relates. Reporting shall continue until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over

Certificate for the Works.

Each report shall include:

- a) Charts and detailed descriptions of progress, including each stage of design (if any), Contractor's Documents, procurement, manufacture, delivery to Site, construction, erection and testing; and including these stages for work by each nominated Subcontractor (as defined in Clause 5 [*Nominated Subcontractors*]);
- b) Photographs showing the status of manufacture and of progress on the Site;
- c) For the manufacture of each main item of Plant and Materials, the name of the manufacturer, manufacture location, percentage progress, and the actual or expected dates of:
 - (i) Commencement of manufacture;
 - (ii) Contractor's inspections;
 - (iii) Tests; and
 - (iv) Shipment and arrival at the Site;
- d) The details described in Sub-Clause 6.10 [*Records of Contractor's Personnel and Equipment*];
- e) Copies of quality assurance documents, test results and certificates of Materials;
- f) List of notices given under Sub-Clause 2.5 [*Employer's Claims*] and notices given under Sub-Clause 20.1 [*Contractor's Claims*];
- g) Safety statistics, including details of any hazardous incidents and activities relating to environmental aspects and public relations; and
- h) Comparisons of actual and planned progress, with details of any events or circumstances which may jeopardise the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome delays.

4.22 Security of the Site

Unless otherwise stated in the Particular Conditions:

- a) The Contractor shall be responsible for keeping unauthorised persons off the Site, and
- b) Authorised persons shall be limited to the Contractor's Personnel and the Employer's Personnel; and to any other personnel notified to the Contractor, by the Employer or the Engineer, as authorised personnel of the Employer's other contractors on the Site.

4.23 Contractor's Operations on Site

The Contractor shall confine his operations to the Site, and to any additional areas which may be obtained by the Contractor and agreed by the Engineer as additional working areas. The Contractor shall take all necessary precautions to keep Contractor's Equipment and Contractor's Personnel within the Site and these additional areas, and to keep them off adjacent land.

During the execution of the Works, the Contractor shall keep the Site free from all unnecessary obstruction, and shall store or dispose of any Contractor's Equipment or surplus materials. The Contractor shall clear away and remove from the Site any wreckage, rubbish and Temporary Works which are no longer required.

Upon the issue of a Taking-Over Certificate, the Contractor shall clear away and remove, from that part of the Site and Works to which the Taking-Over Certificate refers, all Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works. The Contractor shall leave that part of the Site and the Works in a clean and safe condition. However, the Contractor may retain on Site, during the Defects Notification Period, such Goods as are required for the Contractor to fulfil obligations under the Contract.

4.24 Fossils

All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Employer. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings.

The Contractor shall, upon discovery of any such finding, promptly give notice to the Engineer, who shall issue instructions for dealing with it. If the Contractor suffers delay and/or incurs Cost from complying with the instructions, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*]; and
- b) Payment of any such Cost, which shall be included in the Contract Price.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

5 Nominated Subcontractors

5.1 Definition of "Nominated Subcontractor"

In the Contract, "nominated Subcontractor" means a Subcontractor:

- a) Who is stated in the Contract as being a nominated Subcontractor; or
- b) Whom the Engineer, under Clause 13 [*Variations and Adjustments*], instructs the Contractor to employ as a Subcontractor subject to Sub-Clause 5.2 [*Objection to Notification*].

5.2 Objection to Nomination

The Contractor shall not be under any obligation to employ a nominated Subcontractor against whom the Contractor raises reasonable objection by notice to the Engineer as soon as practicable, with supporting particulars. An objection shall be deemed reasonable if it arises from (among other things) any of the following matters, unless the Employer agrees in writing to indemnify the Contractor against and from the consequences of the matter:

- a) There are reasons to believe that the Subcontractor does not have sufficient competence, resources or financial strength;
- b) The nominated Subcontractor does not accept to indemnify the Contractor against and from any negligence or misuse of Goods by the nominated Subcontractor, his agents and employees; or
- c) The nominated Subcontractor does not accept to enter into a subcontract which specifies that, for the subcontracted work (including design, if any), the nominated Subcontractor shall:
 - (i) Undertake to the Contractor such obligations and liabilities as will enable the Contractor to discharge his obligations and liabilities under the Contract;
 - (ii) Indemnify the Contractor against and from all obligations and liabilities arising under or in connection with the Contract and from the consequences of any failure by the Subcontractor to perform these obligations or to fulfil these liabilities; and
 - (iii) Be paid only if and when the Contractor has received from the Employer payments for sums due under the Subcontract referred to under Sub-Clause 5.3 [*Payment to nominated Subcontractors*].

5.3 Payments to Nominated Subcontractors

The Contractor shall pay to the nominated Subcontractor the amounts shown on the nominated Subcontractor's invoices approved by the Contractor which the Engineer certifies to be due in accordance with the subcontract. These amounts plus other charges shall be included in the Contract Price in accordance with sub-paragraph (b) of Sub-Clause 13.5 [*Provisional Sums*], except as stated in Sub-Clause 5.4 [*Evidence of Payments*].

5.4 Evidence of Payments

Before issuing a Payment Certificate which includes an amount payable to a nominated Subcontractor, the Engineer may request the Contractor to supply reasonable evidence that the nominated Subcontractor has received all amounts due in accordance with previous Payment Certificates, less applicable deductions for retention or otherwise. Unless the Contractor:

- a) Submits this reasonable evidence to the Engineer, or
- b)
 - (i) Satisfies the Engineer in writing that the Contractor is reasonably entitled to withhold or refuse to pay these amounts; and
 - (ii) Submits to the Engineer reasonable evidence that the

nominated Subcontractor has been notified of the Contractor's entitlement,

then the Employer may (at his sole discretion) pay, direct to the nominated Subcontractor, part or all of such amounts previously certified (less applicable deductions) as are due to the nominated Subcontractor and for which the Contractor has failed to submit the evidence described in sub-paragraphs (a) or (b) above. The Contractor shall then repay, to the Employer, the amount which the nominated Subcontractor was directly paid by the Employer.

6 Staff and Labour

- 6.1 Engagement of Staff and Labour Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labour, local or otherwise, and for their payment, feeding, transport, and, when appropriate, housing. The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour with appropriate qualifications and experience from sources within the Country.
- 6.2 Rates of Wages and Conditions of Labour The Contractor shall pay rates of wages, and observe conditions of labour, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor. The Contractor shall inform the Contractor's Personnel about their liability to pay personal income taxes in the Country in respect of such of their salaries, wages, allowances and any benefits as are subject to tax under the Laws of the Country for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws.
- 6.3 Persons in the Service of Employer The Contractor shall not recruit, or attempt to recruit, staff and labour from amongst the Employer's Personnel.
- 6.4 Labour Laws The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's Personnel, including Laws relating to their employment, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights. The Contractor shall require his employees to obey all applicable Laws, including those concerning safety at work.
- 6.5 Working Hours No work shall be carried out on the Site on locally recognised days of rest, or outside the normal working hours stated in the Contract Data, unless:
a) Otherwise stated in the Contract;
b) The Engineer gives consent; or
c) The work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Engineer.
- 6.6 Facilities for Staff and Labour Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. The Contractor shall also provide facilities for the Employer's Personnel as stated in the Specification. The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.
- 6.7 Health and Safety The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics. The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to

issue instructions and take protective measures to prevent accidents. Throughout the execution of the Works, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.

The Contractor shall send, to the Engineer, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Engineer may reasonably require.

HIV-AIDS Prevention. The Contractor shall conduct an HIV-AIDS awareness programme via an approved service provider, and shall undertake such other measures as are specified in this Contract to reduce the risk of the transfer of the HIV virus between and among the Contractor's Personnel and the local community, to promote early diagnosis and to assist affected individuals.

The Contractor shall throughout the contract (including the Defects Notification Period): (i) conduct Information, Education and Communication (IEC) campaigns, at least every other month, addressed to all the Site staff and labour (including all the Contractor's employees, all Subcontractors and any other Contractor's or Employer's personnel employees, and all truck drivers and crew making deliveries to Site for construction activities) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behaviour with respect to, of Sexually Transmitted Diseases (STD) - or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular; (ii) provide male or female condoms for all Site staff and labour as appropriate; and (iii) provide for STI and HIV/AIDS screening, diagnosis, counselling and referral to a dedicated national STI and HIV/AIDS programme, (unless otherwise agreed) of all Site staff and labour.

The Contractor shall include in the programme to be submitted for the execution of the Works under Sub-Clause 8.3 an alleviation programme for Site staff and labour and their families in respect of Sexually Transmitted Infections (STI) and Sexually Transmitted Diseases (STD) including HIV/AIDS. The STI, STD and HIV/AIDS alleviation programme shall indicate when, how and at what cost the Contractor plans to satisfy the requirements of this Sub-Clause and the related specification. For each component, the programme shall detail the resources to be provided or utilised and any related sub-contracting proposed. The programme shall also include provision of a detailed cost estimate with supporting documentation. Payment to the Contractor for preparation and implementation this programme shall not exceed the Provisional Sum dedicated for this purpose.

6.8 Contractor's Superintendence

Throughout the execution of the Works, and as long thereafter as is necessary to fulfil the Contractor's obligations, the Contractor shall provide all necessary superintendence to plan, arrange, direct, manage, inspect and test the work.

Superintendence shall be given by a sufficient number of persons having adequate knowledge of the language for communications (defined in Sub-Clause 1.4 [*Law and Language*]) and of the operations to be carried out (including the methods and techniques required, the hazards likely to be encountered and methods of preventing accidents), for the satisfactory and safe execution of the Works.

6.9 Contractor's Personnel

The Contractor's Personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations. The Engineer may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor's Representative if applicable, who:

- a) Persists in any misconduct or lack of care;
- b) Carries out duties incompetently or negligently;
- c) Fails to conform with any provisions of the Contract; or
- d) Persists in any conduct which is prejudicial to safety, health, or the protection of the environment.

If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person.

6.10 Records of Contractor's Personnel and

The Contractor shall submit, to the Engineer, details showing the number of each class of Contractor's Personnel and of each type of Contractor's

Equipment	Equipment on the Site. Details shall be submitted each calendar month, in a form approved by the Engineer, until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.
6.11 Disorderly Conduct	The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst the Contractor's Personnel, and to preserve peace and protection of persons and property on and near the Site.
6.12 Foreign Personnel	<p>The Contractor may bring in to the Country any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor shall ensure that these personnel are provided with the required residence visas and work permits. The Employer will, if requested by the Contractor, use his best endeavours in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national or government permission required for bringing in the Contractor's personnel.</p> <p>The Contractor shall be responsible for the return of these personnel to the place where they were recruited or to their domicile. In the event of the death in the Country of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial.</p>
6.13 Supply of Foodstuffs	The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Specification at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.
6.14 Supply of Water	The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.
6.15 Measures against Insect an Pest Nuisance	The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce the danger to their health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.
6.16 Alcoholic Liquor or Drugs	The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift, barter or disposal thereof by Contractor's Personnel.
6.17 Arms and Ammunition	The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.
6.18 Festivals and Religious Customs	The Contractor shall respect the Country's recognized festivals, days of rest and religious or other customs.
6.19 Funeral Arrangements	The Contractor shall be responsible, to the extent required by local regulations, for making any funeral arrangements for any of his local employees who may die while engaged upon the Works.
6.20 Prohibition of Forced or Compulsory Labour	The Contractor shall not employ forced labour, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements.
6.21 Prohibition of Harmful Child Labour	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 the relevant labour laws of the Country 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.
6.22 Employment Records Workers	The Contractor shall keep complete and accurate records of the employment of labour at the Site. The records shall include the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis and submitted to the Engineer. These records shall be included in the details to be submitted by the Contractor under Sub-Clause 6.10

[Records of Contractor's Personnel and Equipment].

6.23 Workers' Organisations In countries where the relevant labour laws recognise workers' rights to form and to join workers' organisations of their choosing without interference and to bargain collectively, the Contractor shall comply with such laws. Where the relevant labour laws substantially restrict workers' organisations, 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 the relevant labour laws are silent, the Contractor shall not discourage the Contractor's Personnel from forming or joining workers' organisations 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 organisations and bargain collectively. The Contractor shall engage with such workers' representatives. Workers' organisations are expected to fairly represent the workers in the workforce.

6.24 Non-Discrimination and Equal Opportunity 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 the relevant labour laws provide for non-discrimination in employment, the Contractor shall comply with such laws. When the relevant labour laws are silent on non-discrimination in employment, the Contractor shall meet this Sub-Clause'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.

7 Plant, Materials and Workmanship

7.1 Manner of Execution The Contractor shall carry out the manufacture of Plant, the production and manufacture of Materials, and all other execution of the Works:

- a) In the manner (if any) specified in the Contract;
- b) In a proper workmanlike and careful manner, in accordance with recognised good practice; and
- c) With properly equipped facilities and non-hazardous Materials, except as otherwise specified in the Contract.

7.2 Samples The Contractor shall submit the following samples of Materials, and relevant information, to the Engineer for consent prior to using the Materials in or for the Works:

- a) Manufacturer's standard samples of Materials and samples specified in the Contract, all at the Contractor's cost; and
- b) Additional samples instructed by the Engineer as a Variation.

Each sample shall be labelled as to origin and intended use in the Works.

7.3 Inspection The Employer's Personnel shall at all reasonable times:

- a) Have full access to all parts of the Site and to all places from which natural Materials are being obtained; and
- b) During production, manufacture and construction (at the Site and elsewhere), be entitled to examine, inspect, measure and test the materials and workmanship, and to check the progress of manufacture of Plant and production and manufacture of Materials.

The Contractor shall give the Employer's Personnel full opportunity to carry out these activities, including providing access, facilities, permissions and safety equipment. No such activity shall relieve the Contractor from any obligation or responsibility.

The Contractor shall give notice to the Engineer whenever any work is ready and before it is covered up, put out of sight, or packaged for storage or transport. The Engineer shall then either carry out the examination, inspection, measurement or testing without unreasonable delay, or promptly give notice

to the Contractor that the Engineer does not require to do so. If the Contractor fails to give the notice, he shall, if and when required by the Engineer, uncover the work and thereafter reinstate and make good, all at the Contractor's cost.

7.4 Testing

This Sub-Clause shall apply to all tests specified in the Contract, other than the Tests after Completion (if any).

Except as otherwise specified in the Contract, the Contractor shall provide all apparatus, assistance, documents and other information, electricity, equipment, fuel, consumables, instruments, labour, materials, and suitably qualified and experienced staff, as are necessary to carry out the specified tests efficiently. The Contractor shall agree, with the Engineer, the time and place for the specified testing of any Plant, Materials and other parts of the Works.

The Engineer may, under Clause 13 [*Variations and Adjustments*], vary the location or details of specified tests, or instruct the Contractor to carry out additional tests. If these varied or additional tests show that the tested Plant, Materials or workmanship is not in accordance with the Contract, the cost of carrying out this Variation shall be borne by the Contractor, notwithstanding other provisions of the Contract.

The Engineer shall give the Contractor not less than 24 hours' notice of the Engineer's intention to attend the tests. If the Engineer does not attend at the time and place agreed, the Contractor may proceed with the tests, unless otherwise instructed by the Engineer, and the tests shall then be deemed to have been made in the Engineer's presence.

If the Contractor suffers delay and/or incurs Cost from complying with these instructions or as a result of a delay for which the Employer is responsible, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*]; and
- b) Payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

The Contractor shall promptly forward to the Engineer duly certified reports of the tests. When the specified tests have been passed, the Engineer shall endorse the Contractor's test certificate, or issue a certificate to him, to that effect. If the Engineer has not attended the tests, he shall be deemed to have accepted the readings as accurate.

7.5 Rejection

If, as a result of an examination, inspection, measurement or testing, any Plant, Materials or workmanship is found to be defective or otherwise not in accordance with the Contract, the Engineer may reject the Plant, Materials or workmanship by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the defect and ensure that the rejected item complies with the Contract.

If the Engineer requires this Plant, Materials or workmanship to be retested, the tests shall be repeated under the same terms and conditions. If the rejection and retesting cause the Employer to incur additional costs, the Contractor shall subject to Sub-Clause 2.5 [*Employer's Claims*] pay these costs to the Employer.

7.6 Remedial Work

Notwithstanding any previous test or certification, the Engineer may instruct the Contractor to:

- a) Remove from the Site and replace any Plant or Materials which is not in accordance with the Contract;
- b) Remove and re-execute any other work which is not in accordance with the Contract; and
- c) Execute any work which is urgently required for the safety of the Works, whether because of an accident, unforeseeable event or otherwise.

The Contractor shall comply with the instruction within a reasonable time, which shall be the time (if any) specified in the instruction, or immediately if

urgency is specified under sub-paragraph (c).

If the Contractor fails to comply with the instruction, the Employer shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Contractor would have been entitled to payment for the work, the Contractor shall subject to Sub-Clause 2.5 *[Employer's Claims]* pay to the Employer all costs arising from this failure.

7.7 Ownership of Plant and Materials Except as otherwise provided in the Contract, each item of Plant and Materials shall, to the extent consistent with the Laws of the Country, become the property of the Employer at whichever is the earlier of the following times, free from liens and other encumbrances:

- a) When it is incorporated in the Works;
- b) When the Contractor is paid the corresponding value of the Plant and Materials under Sub-Clause 8.10 *[Payment for Plant and Materials in Event of Suspension]*.

7.8 Royalties Unless otherwise stated in the Specification, the Contractor shall pay all royalties, rents and other payments for:

- a) Natural Materials obtained from outside the Site, and
- b) The disposal of material from demolitions and excavations and of other surplus material (whether natural or man-made), except to the extent that disposal areas within the Site are specified in the Contract.

8 Commencement, Delays Suspension

8.1 Commencement of Works Except as otherwise specified in the Particular Conditions of Contract, the Commencement Date shall be the date at which the following precedent conditions have all been fulfilled and the Engineer's notification recording the agreement of both Parties on such fulfilment and instructing to commence the Work is received by the Contractor:

- a) Signature of the Contract Agreement by both Parties, and if required, approval of the Contract by relevant authorities of the Country;
- b) Delivery to the Contractor of reasonable evidence of the Employer's financial arrangements (under Sub-Clause 2.4 *[Employer's Financial Arrangements]*);
- c) Except if otherwise specified in the Contract Data, effective access to and possession of the Site given to the Contractor together with such permission(s) under (a) of Sub-Clause 1.13 *[Compliance with Laws]* as required for the commencement of the Works;
- d) Receipt by the Contractor of the Advance Payment under Sub-Clause 14.2 *[Advance Payment]* provided that the corresponding bank guarantee has been delivered by the Contractor.

If the said Engineer's instruction is not received by the Contractor within 180 days from his receipt of the Letter of Acceptance, the Contractor shall be entitled to terminate the Contract under Sub-Clause 16.2 *[Termination by Contractor]*.

The Contractor shall commence the execution of the Works as soon as is reasonably practicable after the Commencement Date, and shall then proceed with the Works with due expedition and without delay.

8.2 Time for Completion The Contractor shall complete the whole of the Works, and each Section (if any), within the Time for Completion for the Works or Section (as the case may be), including:

- a) Achieving the passing of the Tests on Completion; and
- b) Completing all work which is stated in the Contract as being required for the Works or Section to be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 *[Taking Over of the Works and Sections]*.

8.3 Programme The Contractor shall submit a detailed time programme to the Engineer within 28 days after receiving the notice under Sub-Clause 8.1 *[Commencement of Works]*. The Contractor shall also submit a revised programme whenever the previous programme is inconsistent with actual progress or with the Contractor's obligations. Each programme shall include:

- a) The order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage of design (if any), Contractor's Documents, procurement, manufacture of Plant, delivery to Site, construction, erection and testing;
- b) Each of these stages for work by each nominated Subcontractor (as defined in Clause 5 [*Nominated Subcontractors*]);
- c) The sequence and timing of inspections and tests specified in the Contract; and
- d) A supporting report which includes:
 - (i) A general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works; and
 - (ii) Details showing the Contractor's reasonable estimate of the number of each class of Contractor's Personnel and of each type of Contractor's Equipment, required on the Site for each major stage.

Unless the Engineer, within 21 days after receiving a programme, gives notice to the Contractor stating the extent to which it does not comply with the Contract, the Contractor shall proceed in accordance with the programme, subject to his other obligations under the Contract. The Employer's Personnel shall be entitled to rely upon the programme when planning their activities.

The Contractor shall promptly give notice to the Engineer of specific probable future events or circumstances which may adversely affect the work, increase the Contract Price or delay the execution of the Works. The Engineer may require the Contractor to submit an estimate of the anticipated effect of the future event or circumstances, and/or a proposal under Sub-Clause 13.3 [*Variation Procedure*].

If, at any time, the Engineer gives notice to the Contractor that a programme fails (to the extent stated) to comply with the Contract or to be consistent with actual progress and the Contractor's stated intentions, the Contractor shall submit a revised programme to the Engineer in accordance with this Sub-Clause.

8.4 Extension of Time for Completion

The Contractor shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to an extension of the Time for Completion if and to the extent that completion for the purposes of Sub-Clause 10.1 [*Taking Over of the Works and Sections*] is or will be delayed by any of the following causes:

- a) A Variation (unless an adjustment to the Time for Completion has been agreed under Sub-Clause 13.3 [*Variation Procedure*]) or other substantial change in the quantity of an item of work included in the Contract;
- b) A cause of delay giving an entitlement to extension of time under a Sub-Clause of these Conditions;
- c) Exceptionally adverse climatic conditions;
- d) Unforeseeable shortages in the availability of personnel or Goods caused by epidemic or governmental actions; or
- e) Any delay, impediment or prevention caused by or attributable to the Employer, the Employer's Personnel, or the Employer's other contractors.

If the Contractor considers himself to be entitled to an extension of the Time for Completion, the Contractor shall give notice to the Engineer in accordance with Sub-Clause 20.1 [*Contractor's Claims*]. When determining each extension of time under Sub-Clause 20.1, the Engineer shall review previous determinations and may increase, but shall not decrease, the total extension of time.

8.5 Delays Caused by Authorities

If the following conditions apply, namely:

- a) The Contractor has diligently followed the procedures laid down by the relevant legally constituted public authorities in the Country;
- b) These authorities delay or disrupt the Contractor's work; and

- c) The delay or disruption was Unforeseeable, then this delay or disruption will be considered as a cause of delay under subparagraph (b) of Sub-Clause 8.4 [*Extension of Time for Completion*].
- 8.6 Rate of Progress
- If, at any time:
- a) Actual progress is too slow to complete within the Time for Completion; and/or
- b) Progress has fallen (or will fall) behind the current programme under Sub-Clause 8.3 [*Programme*],
- other than as a result of a cause listed in Sub-Clause 8.4 [*Extension of Time for Completion*], then the Engineer may instruct the Contractor to submit, under Sub-Clause 8.3 [*Programme*], a revised programme and supporting report describing the revised methods which the Contractor proposes to adopt in order to expedite progress and complete within the Time for Completion.
- Unless the Engineer notifies otherwise, the Contractor shall adopt these revised methods, which may require increases in the working hours and/or in the numbers of Contractor's Personnel and/or Goods, at the risk and cost of the Contractor. If these revised methods cause the Employer to incur additional costs, the Contractor shall subject to notice under Sub-Clause 2.5 [*Employer's Claims*] pay these costs to the Employer, in addition to delay damages (if any) under Sub-Clause 8.7 below.
- Additional costs of revised methods including acceleration measures, instructed by the Engineer to reduce delays resulting from causes listed under Sub-Clause 8.4 [*Extension of Time for Completion*] shall be paid by the Employer, without generating, however, any other additional payment benefit to the Contractor.
- 8.7 Delay Damages
- If the Contractor fails to comply with Sub-Clause 8.2 [*Time for Completion*], the Contractor shall subject to notice under Sub-Clause 2.5 [*Employer's Claims*] pay delay damages to the Employer for this default. These delay damages shall be the sum stated in the Contract Data, which shall be paid for every day which shall elapse between the relevant Time for Completion and the date stated in the Taking-Over Certificate. However, the total amount due under this Sub-Clause shall not exceed the maximum amount of delay damages (if any) stated in the Contract Data.
- These delay damages shall be the only damages due from the Contractor for such default, other than in the event of termination under Sub-Clause 15.2 [*Termination by Employer*] prior to completion of the Works. These damages shall not relieve the Contractor from his obligation to complete the Works, or from any other duties, obligations or responsibilities which he may have under the Contract.
- 8.8 Suspension of Work
- The Engineer may at any time instruct the Contractor to suspend progress of part or all of the Works. During such suspension, the Contractor shall protect, store and secure such part or the Works against any deterioration, loss or damage.
- The Engineer may also notify the cause for the suspension. If and to the extent that the cause is notified and is the responsibility of the Contractor, the following Sub-Clauses 8.9, 8.10 and 8.11 shall not apply.
- 8.9 Consequences of Suspension
- If the Contractor suffers delay and/or incurs Cost from complying with the Engineer's instructions under Sub-Clause 8.8 [*Suspension of Work*] and/or from resuming the work, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:
- a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*]; and
- b) Payment of any such Cost, which shall be included in the Contract Price.
- After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.
- The Contractor shall not be entitled to an extension of time for, or to payment of the Cost incurred in, making good the consequences of the Contractor's faulty design, workmanship or materials, or of the Contractor's failure to

- protect, store or secure in accordance with Sub-Clause 8.8 [*Suspension of Work*].
- 8.10 Payment for Plant and Materials in Event of Suspension
The Contractor shall be entitled to payment of the value (as at the date of suspension) of Plant and/or Materials which have not been delivered to Site, if:
- a) The work on Plant or delivery of Plant and/or Materials has been suspended for more than 28 days; and
 - b) The Contractor has marked the Plant and/or Materials as the Employer's property in accordance with the Engineer's instructions.
- 8.11 Prolonged Suspension
If the suspension under Sub-Clause 8.8 [*Suspension of Work*] has continued for more than 84 days, the Contractor may request the Engineer's permission to proceed. If the Engineer does not give permission within 28 days after being requested to do so, the Contractor may, by giving notice to the Engineer, treat the suspension as an omission under Clause 13 [*Variations and Adjustments*] of the affected part of the Works. If the suspension affects the whole of the Works, the Contractor may give notice of termination under Sub-Clause 16.2 [*Termination by Contractor*].
- 8.12 Resumption of Work
After the permission or instruction to proceed is given, the Contractor and the Engineer shall jointly examine the Works and the Plant and Materials affected by the suspension. The Contractor shall make good any deterioration or defect in or loss of the Works or Plant or Materials, which has occurred during the suspension after receiving from the Engineer an instruction to this effect under Clause 13 [*Variations and Adjustments*].

9 Tests on Completion

- 9.1 Contractor's Obligations
The Contractor shall carry out the Tests on Completion in accordance with this Clause and Sub-Clause 7.4 [*Testing*], after providing the documents in accordance with sub-paragraph (d) of Sub-Clause 4.1 [*Contractor's General Obligations*].
- The Contractor shall give to the Engineer not less than 21 days' notice of the date after which the Contractor will be ready to carry out each of the Tests on Completion. Unless otherwise agreed, Tests on Completion shall be carried out within 14 days after this date, on such day or days as the Engineer shall instruct.
- In considering the results of the Tests on Completion, the Engineer shall make allowances for the effect of any use of the Works by the Employer on the performance or other characteristics of the Works. As soon as the Works, or a Section, have passed any Tests on Completion, the Contractor shall submit a certified report of the results of these Tests to the Engineer.
- 9.2 Delayed Tests
If the Tests on Completion are being unduly delayed by the Employer, Sub-Clause 7.4 [*Testing*] (fifth paragraph) and/or Sub-Clause 10.3 [*Interference with Tests on Completion*] shall be applicable.
- If the Tests on Completion are being unduly delayed by the Contractor, the Engineer may by notice require the Contractor to carry out the Tests within 21 days after receiving the notice. The Contractor shall carry out the Tests on such day or days within that period as the Contractor may fix and of which he shall give notice to the Engineer.
- If the Contractor fails to carry out the Tests on Completion within the period of 21 days, the Employer's Personnel may proceed with the Tests at the risk and cost of the Contractor. The Tests on Completion shall then be deemed to have been carried out in the presence of the Contractor and the results of the Tests shall be accepted as accurate.
- 9.3 Retesting
If the Works, or a Section, fail to pass the Tests on Completion, Sub-Clause 7.5 [*Rejection*] shall apply, and the Engineer or the Contractor may require the failed Tests, and Tests on Completion on any related work, to be repeated under the same terms and conditions.
- 9.4 Failure to Pass Tests on Completion
If the Works, or a Section, fail to pass the Tests on Completion repeated under Sub-Clause 9.3 [*Retesting*], the Engineer shall be entitled to:
- a) Order further repetition of Tests on Completion under Sub-Clause 9.3 [*Retesting*];
 - b) If the failure deprives the Employer of substantially the whole benefit

of the Works or Section, reject the Works or Section (as the case may be), in which event the Employer shall have the same remedies as are provided in sub-paragraph (c) of Sub-Clause 11.4 [*Failure to Remedy Defects*]; or

c) Issue a Taking-Over Certificate, if the Employer so requests.

In the event of sub-paragraph (c), the Contractor shall proceed in accordance with all other obligations under the Contract, and the Contract Price shall be reduced by such amount as shall be appropriate to cover the reduced value to the Employer as a result of this failure. Unless the relevant reduction for this failure is stated (or its method of calculation is defined) in the Contract, the Employer may require the reduction to be (i) agreed by both Parties (in full satisfaction of this failure only) and paid before this Taking-Over Certificate is issued, or (ii) determined and paid under Sub-Clause 2.5 [*Employer's Claims*] and Sub-Clause 3.5 [*Determinations*].

10 Employer's Taking Over

10.1 Taking Over of the Works and Sections

Except as stated in Sub-Clause 9.4 [*Failure to Pass Tests on Completion*], the Works shall be taken over by the Employer when (i) the Works have been completed in accordance with the Contract, including the matters described in Sub-Clause 8.2 [*Time for Completion*] and except as allowed in sub-paragraph (a) below, and (ii) a Taking-Over Certificate for the Works has been issued, or is deemed to have been issued in accordance with this Sub-Clause.

The Contractor may apply by notice to the Engineer for a Taking-Over Certificate not earlier than 14 days before the Works will, in the Contractor's opinion, be complete and ready for taking over. If the Works are divided into Sections, the Contractor may similarly apply for a Taking-Over Certificate for each Section.

The Engineer shall, within 28 days after receiving the Contractor's application:

- a) Issue the Taking-Over Certificate to the Contractor, stating the date on which the Works or Section were completed in accordance with the Contract, except for any minor outstanding work and defects which will not substantially affect the use of the Works or Section for their intended purpose (either until or whilst this work is completed and these defects are remedied); or
- b) Reject the application, giving reasons and specifying the work required to be done by the Contractor to enable the Taking-Over Certificate to be issued. The Contractor shall then complete this work before issuing a further notice under this Sub-Clause.

If the Engineer fails either to issue the Taking-Over Certificate or to reject the Contractor's application within the period of 28 days, and if the Works or Section (as the case may be) are substantially in accordance with the Contract, the Taking-Over Certificate shall be deemed to have been issued on the last day of that period.

10.2 Taking Over of Parts of the Works

The Engineer may, at the sole discretion of the Employer, issue a Taking-Over Certificate for any part of the Permanent Works.

The Employer shall not use any part of the Works (other than as a temporary measure which is either specified in the Contract or agreed by both Parties) unless and until the Engineer has issued a Taking-Over Certificate for this part. However, if the Employer does use any part of the Works before the Taking-Over Certificate is issued:

- a) The part which is used shall be deemed to have been taken over as from the date on which it is used;
- b) The Contractor shall cease to be liable for the care of such part as from this date, when responsibility shall pass to the Employer, and
- c) If requested by the Contractor, the Engineer shall issue a Taking-Over Certificate for this part.

After the Engineer has issued a Taking-Over Certificate for a part of the Works, the Contractor shall be given the earliest opportunity to take such steps as may be necessary to carry out any outstanding Tests on Completion. The Contractor shall carry out these Tests on Completion as soon as practicable before the

expiry date of the relevant Defects Notification Period.

If the Contractor incurs Cost as a result of the Employer taking over and/or using a part of the Works, other than such use as is specified in the Contract or agreed by the Contractor, the Contractor shall (i) give notice to the Engineer and (ii) be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to payment of any such Cost plus profit, which shall be included in the Contract Price. After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine this Cost and profit.

If a Taking-Over Certificate has been issued for a part of the Works (other than a Section), the delay damages thereafter for completion of the remainder of the Works shall be reduced. Similarly, the delay damages for the remainder of the Section (if any) in which this part is included shall also be reduced. For any period of delay after the date stated in this Taking-Over Certificate, the proportional reduction in these delay damages shall be calculated as the proportion which the value of the part so certified bears to the value of the Works or Section (as the case may be) as a whole. The Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these proportions. The provisions of this paragraph shall only apply to the daily rate of delay damages under Sub-Clause 8.7 [*Delay Damages*], and shall not affect the maximum amount of these damages.

10.3 Interference with Tests on Completion

If the Contractor is prevented, for more than 14 days, from carrying out the Tests on Completion by a cause for which the Employer is responsible, the Employer shall be deemed to have taken over the Works or Section (as the case may be) on the date when the Tests on Completion would otherwise have been completed.

The Engineer shall then issue a Taking-Over Certificate accordingly, and the Contractor shall carry out the Tests on Completion as soon as practicable, before the expiry date of the Defects Notification Period. The Engineer shall require the Tests on Completion to be carried out by giving 14 days' notice and in accordance with the relevant provisions of the Contract.

If the Contractor suffers delay and/or incurs Cost as a result of this delay in carrying out the Tests on Completion, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*]; and
- b) Payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

10.4 Surfaces Requiring Reinstatement

Except as otherwise stated in a Taking-Over Certificate, a certificate for a Section or part of the Works shall not be deemed to certify completion of any ground or other surfaces requiring reinstatement.

11 Defects Liability

11.1 Completion of Outstanding Work and Remedying Defects

In order that the Works and Contractor's Documents, and each Section, shall be in the condition required by the Contract (fair wear and tear excepted) by the expiry date of the relevant Defects Notification Period or as soon as practicable thereafter, the Contractor shall:

- a) Complete any work which is outstanding on the date stated in a Taking-Over Certificate, within such reasonable time as is instructed by the Engineer; and
- b) Execute all work required to remedy defects or damage, as may be notified by (or on behalf of) the Employer on or before the expiry date of the Defects Notification Period for the Works or Section (as the case may be).

If a defect appears or damage occurs, the Contractor shall be notified accordingly, by (or on behalf of) the Employer.

11.2 Cost of Remedying Defects

All work referred to in sub-paragraph (b) of Sub-Clause 11.1 [*Completion of Outstanding Work and Remedying Defects*] shall be executed at the risk and cost

of the Contractor, if and to the extent that the work is attributable to:

- a) Any design for which the Contractor is responsible;
- b) Plant, Materials or workmanship not being in accordance with the Contract; or
- c) Failure by the Contractor to comply with any other obligation.

If and to the extent that such work is attributable to any other cause, the Contractor shall be notified promptly by (or on behalf of) the Employer, and Sub-Clause 13.3 [*Variation Procedure*] shall apply.

11.3 Extension of Defects Notification Period

The Employer shall be entitled subject to Sub-Clause 2.5 [*Employer's Claims*] to an extension of the Defects Notification Period for the Works or a Section if and to the extent that the Works, Section or a major item of Plant (as the case may be, and after taking over) cannot be used for the purposes for which they are intended by reason of a defect or by reason of damage attributable to the Contractor. However, a Defects Notification Period shall not be extended by more than two years.

If delivery and/or erection of Plant and/or Materials was suspended under Sub-Clause 8.8 [*Suspension of Work*] or Sub-Clause 16.1 [*Contractor's Entitlement to Suspend Work*], the Contractor's obligations under this Clause shall not apply to any defects or damage occurring more than two years after the Defects Notification Period for the Plant and/or Materials would otherwise have expired.

11.4 Failure to Remedy Defects

If the Contractor fails to remedy any defect or damage within a reasonable time, a date may be fixed by (or on behalf of) the Employer, on or by which the defect or damage is to be remedied. The Contractor shall be given reasonable notice of this date.

If the Contractor fails to remedy the defect or damage by this notified date and this remedial work was to be executed at the cost of the Contractor under Sub-Clause 11.2 [*Cost of Remedying Defects*], the Employer may (at his option):

- a) Carry out the work himself or by others, in a reasonable manner and at the Contractor's cost, but the Contractor shall have no responsibility for this work; and the Contractor shall subject to Sub-Clause 2.5 [*Employer's Claims*] pay to the Employer the costs reasonably incurred by the Employer in remedying the defect or damage;
- b) Require the Engineer to agree or determine a reasonable reduction in the Contract Price in accordance with Sub-Clause 3.5 [*Determinations*]; or
- c) If the defect or damage deprives the Employer of substantially the whole benefit of the Works or any major part of the Works, terminate the Contract as a whole, or in respect of such major part which cannot be put to the intended use. Without prejudice to any other rights, under the Contract or otherwise, the Employer shall then be entitled to recover all sums paid for the Works or for such part (as the case may be), plus financing costs and the cost of dismantling the same, clearing the Site and returning Plant and Materials to the Contractor.

11.5 Removal of Defective Work

If the defect or damage cannot be remedied expeditiously on the Site and the Employer gives consent, the Contractor may remove from the Site for the purposes of repair such items of Plant as are defective or damaged. This consent may require the Contractor to increase the amount of the Performance Security by the full replacement cost of these items, or to provide other appropriate security.

11.6 Further Tests

If the work of remedying of any defect or damage may affect the performance of the Works, the Engineer may require the repetition of any of the tests described in the Contract. The requirement shall be made by notice within 28 days after the defect or damage is remedied.

These tests shall be carried out in accordance with the terms applicable to the previous tests, except that they shall be carried out at the risk and cost of the Party liable, under Sub-Clause 11.2 [*Cost of Remedying Defects*], for the cost of the remedial work.

11.7 Right of Access

Until the Performance Certificate has been issued, the Contractor shall have

such right of access to the Works as is reasonably required in order to comply with this Clause, except as may be inconsistent with the Employer's reasonable security restrictions.

- 11.8 Contractor to Search The Contractor shall, if required by the Engineer, search for the cause of any defect, under the direction of the Engineer. Unless the defect is to be remedied at the cost of the Contractor under Sub-Clause 11.2 [*Cost of Remedying Defects*], the Cost of the search plus profit shall be agreed or determined by the Engineer in accordance with Sub-Clause 3.5 [*Determinations*] and shall be included in the Contract Price.
- 11.9 Performance Certificate Performance of the Contractor's obligations shall not be considered to have been completed until the Engineer has issued the Performance Certificate to the Contractor, stating the date on which the Contractor completed his obligations under the Contract.
- The Engineer shall issue the Performance Certificate within 28 days after the latest of the expiry dates of the Defects Notification Periods, or as soon thereafter as the Contractor has supplied all the Contractor's Documents and completed and tested all the Works, including remedying any defects. A copy of the Performance Certificate shall be issued to the Employer.
- Only the Performance Certificate shall be deemed to constitute acceptance of the Works.
- 11.10 Unfulfilled Obligations After the Performance Certificate has been issued, each Party shall remain liable for the fulfilment of any obligation which remains unperformed at that time. For the purposes of determining the nature and extent of unperformed obligations, the Contract shall be deemed to remain in force.
- 11.11 Clearance of Site Upon receiving the Performance Certificate, the Contractor shall remove any remaining Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works from the Site.
- If all these items have not been removed within 28 days after receipt by the Contractor of the Performance Certificate, the Employer may sell or otherwise dispose of any remaining items. The Employer shall be entitled to be paid the costs incurred in connection with, or attributable to, such sale or disposal and restoring the Site.
- Any balance of the moneys from the sale shall be paid to the Contractor. If these moneys are less than the Employer's costs, the Contractor shall pay the outstanding balance to the Employer.

12 Measurement and Evaluation

- 12.1 Works to be Measured The Works shall be measured, and valued for payment, in accordance with this Clause. The Contractor shall show in each application under Sub-Clauses 14.3 [*Application for Interim Payment Certificates*], 14.10 [*Statement on Completion*] and 14.11 [*Application for Final Payment Certificate*] the quantities and other particulars detailing the amounts which he considers to be entitled under the Contract.
- Whenever the Engineer requires any part of the Works to be measured, reasonable notice shall be given to the Contractor's Representative, who shall:
- a) Promptly either attend or send another qualified representative to assist the Engineer in making the measurement; and
 - b) Supply any particulars requested by the Engineer.
- If the Contractor fails to attend or send a representative, the measurement made by (or on behalf of) the Engineer shall be accepted as accurate.
- Except as otherwise stated in the Contract, wherever any Permanent Works are to be measured from records, these shall be prepared by the Engineer. The Contractor shall, as and when requested, attend to examine and agree the records with the Engineer, and shall sign the same when agreed. If the Contractor does not attend, the records shall be accepted as accurate.
- If the Contractor examines and disagrees the records, and/or does not sign them as agreed, then the Contractor shall give notice to the Engineer of the respects in which the records are asserted to be inaccurate. After receiving this notice, the Engineer shall review the records and either confirm or vary them and certify the payment of the undisputed part. If the Contractor does not so

give notice to the Engineer within 14 days after being requested to examine the records, they shall be accepted as accurate.

12.2 Method of Measurement

Except as otherwise stated in the Contract and notwithstanding local practice:

- a) Measurement shall be made of the net actual quantity of each item of the Permanent Works; and
- b) The method of measurement shall be in accordance with the Bill of Quantities or other applicable Schedules.

12.3 Evaluation

Except as otherwise stated in the Contract, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine the Contract Price by evaluating each item of work, applying the measurement agreed or determined in accordance with the above Sub-Clauses 12.1 and 12.2 and the appropriate rate or price for the item.

For each item of work, the appropriate rate or price for the item shall be the rate or price specified for such item in the Contract or, if there is no such item, specified for similar work.

Any item of work included in the Bill of Quantities for which no rate or price was specified shall be considered as included in other rates and prices in the Bill of Quantities and will not be paid for separately.

However, a new rate or price shall be appropriate for an item of work if:

- a)
 - (i) The measured quantity of the item is changed by more than 25% from the quantity of this item in the Bill of Quantities or other Schedule;
 - (ii) This change in quantity multiplied by such specified rate for this item exceeds 0.25% of the Accepted Contract Amount;
 - (iii) This change in quantity directly changes the Cost per unit quantity of this item by more than 1%; and
 - (iv) This item is not specified in the Contract as a "fixed rate item";

Or

- b)
 - (i) The work is instructed under Clause 13 [*Variations and Adjustments*];
 - (ii) No rate or price is specified in the Contract for this item; and
 - (iii) No specified rate or price is appropriate because the item of work is not of similar character, or is not executed under similar conditions, as any item in the Contract.

Each new rate or price shall be derived from any relevant rates or prices in the Contract, with reasonable adjustments to take account of the matters described in sub-paragraph (a) and/or (b), as applicable. If no rates or prices are relevant for the derivation of a new rate or price, it shall be derived from the reasonable Cost of executing the work, together with profit, taking account of any other relevant matters.

Until such time as an appropriate rate or price is agreed or determined, the Engineer shall determine a provisional rate or price for the purposes of Interim Payment Certificates as soon as the concerned work commences.

12.4 Omissions

Whenever the omission of any work forms part (or all) of a Variation, the value of which has not been agreed, if:

- a) The Contractor will incur (or has incurred) cost which, if the work had not been omitted, would have been deemed to be covered by a sum forming part of the Accepted Contract Amount;
- b) The omission of the work will result (or has resulted) in this sum not forming part of the Contract Price; and
- c) This cost is not deemed to be included in the evaluation of any substituted work;

then the Contractor shall give notice to the Engineer accordingly, with supporting particulars. Upon receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine this cost, which shall be included in the Contract Price.

13 Variations and Adjustments

13.1 Right to Vary

Variations may be initiated by the Engineer at any time prior to issuing the Taking-Over Certificate for the Works, either by an instruction or by a request for the Contractor to submit a proposal.

The Contractor shall execute and be bound by each Variation, unless the Contractor promptly gives notice to the Engineer stating (with supporting particulars) that (i) the Contractor cannot readily obtain the Goods required for the Variation, or (ii) such Variation triggers a substantial change in the sequence or progress of the Works. Upon receiving this notice, the Engineer shall cancel, confirm or vary the instruction.

Each Variation may include:

- a) Changes to the quantities of any item of work included in the Contract (however, such changes do not necessarily constitute a Variation);
- b) Changes to the quality and other characteristics of any item of work;
- c) Changes to the levels, positions and/or dimensions of any part of the Works;
- d) Omission of any work unless it is to be carried out by others;
- e) Any additional work, Plant, Materials or services necessary for the Permanent Works, including any associated Tests on Completion, boreholes and other testing and exploratory work; or
- f) Changes to the sequence or timing of the execution of the Works.

The Contractor shall not make any alteration and/or modification of the Permanent Works, unless and until the Engineer instructs or approves a Variation.

13.2 Value Engineering

The Contractor may, at any time, submit to the Engineer a written proposal which (in the Contractor's opinion) will, if adopted, (i) accelerate completion, (ii) reduce the cost to the Employer of executing, maintaining or operating the Works, (iii) improve the efficiency or value to the Employer of the completed Works, or (iv) otherwise be of benefit to the Employer.

The proposal shall be prepared at the cost of the Contractor and shall include the items listed in Sub-Clause 13.3 [*Variation Procedure*].

If a proposal, which is approved by the Engineer, includes a change in the design of part of the Permanent Works, then unless otherwise agreed by both Parties:

- a) The Contractor shall design this part;
- b) Sub-paragraphs (a) to (d) of Sub-Clause 4.1 [*Contractor's General Obligations*] shall apply; and
- c) If this change results in a reduction in the contract value of this part, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine a fee, which shall be included in the Contract Price. This fee shall be half (50%) of the difference between the following amounts:
 - (i) Such reduction in contract value, resulting from the change, excluding adjustments under Sub-Clause 13.7 [*Adjustments for Changes in Legislation*] and Sub-Clause 13.8 [*Adjustments for Changes in Cost*]; and
 - (ii) The reduction (if any) in the value to the Employer of the varied works, taking account of any reductions in quality, anticipated life or operational efficiencies.

However, if amount (i) is less than amount (ii), there shall not be a fee.

13.3 Variation Procedure

If the Engineer requests a proposal, prior to instructing a Variation, the Contractor shall respond in writing as soon as practicable, either by giving reasons why he cannot comply (if this is the case) or by submitting:

- a) A description of the proposed work to be performed and a programme for its execution;
- b) The Contractor's proposal for any necessary modifications to the programme according to Sub-Clause 8.3 [*Programme*] and to the Time

for Completion; and

c) The Contractor's proposal for evaluation of the Variation.

The Engineer shall, as soon as practicable after receiving such proposal (under Sub-Clause 13.2 [*Value Engineering*] or otherwise), respond with approval, disapproval or comments. The Contractor shall not delay any work whilst awaiting a response.

Each instruction to execute a Variation, with any requirements for the recording of Costs, shall be issued by the Engineer to the Contractor, who shall acknowledge receipt.

Each Variation shall be evaluated in accordance with Clause 12 [*Measurement and Evaluation*], unless the Engineer instructs or approves otherwise in accordance with this Clause.

13.4 Payment in Applicable Currencies

If the Contract provides for payment of the Contract Price in more than one currency, then whenever an adjustment is agreed, approved or determined as stated above, the amount payable in each of the applicable currencies shall be specified. For this purpose, reference shall be made to the actual or expected currency proportions of the Cost of the varied work, and to the proportions of various currencies specified for payment of the Contract Price.

13.5 Provisional Sums

Each Provisional Sum shall only be used, in whole or in part, in accordance with the Engineer's instructions, and the Contract Price shall be adjusted accordingly. The total sum paid to the Contractor shall include only such amounts, for the work, supplies or services to which the Provisional Sum relates, as the Engineer shall have instructed. For each Provisional Sum, the Engineer may instruct:

- a) Work to be executed (including Plant, Materials or services to be supplied) by the Contractor and valued under Sub-Clause 13.3 [*Variation Procedure*]; and/or
- b) Plant, Materials or services to be purchased by the Contractor, from a nominated Subcontractor (as defined in Clause 5 [*Nominated Subcontractors*]) or otherwise; and for which there shall be included in the Contract Price:
 - (i) The actual amounts paid (or due to be paid) by the Contractor; and
 - (ii) A sum for overhead charges and profit, calculated as a percentage of these actual amounts by applying the relevant percentage rate (if any) stated in the appropriate Schedule. If there is no such rate, the percentage rate stated in the Contract Data shall be applied.

The Contractor shall, when required by the Engineer, produce quotations, invoices, vouchers and accounts or receipts in substantiation.

13.6 Daywork

For work of a minor or incidental nature, the Engineer may instruct that a Variation shall be executed on a daywork basis. The work shall then be valued in accordance with the Daywork Schedule included in the Contract, and the following procedure shall apply. If a Daywork Schedule is not included in the Contract, this Sub-Clause shall not apply.

Before ordering Goods for the work, the Contractor shall submit quotations to the Engineer. When applying for payment, the Contractor shall submit invoices, vouchers and accounts or receipts for any Goods.

Except for any items for which the Daywork Schedule specifies that payment is not due, the Contractor shall deliver each day to the Engineer accurate statements in duplicate which shall include the following details of the resources used in executing the previous day's work:

- a) The names, occupations and time of Contractor's Personnel;
- b) The identification, type and time of Contractor's Equipment and Temporary Works; and
- c) The quantities and types of Plant and Materials used.

One copy of each statement will, if correct, or when agreed, be signed by the Engineer and returned to the Contractor. The Contractor shall then submit

priced statements of these resources to the Engineer, prior to their inclusion in the next Statement under Sub-Clause 14.3 [Application for Interim Payment Certificates].

13.7 Adjustments for
Changes in Legislation

The Contract Price shall be adjusted to take account of any increase or decrease in Cost resulting from a change in the Laws of the Country (including the introduction of new Laws and the repeal or modification of existing Laws) or in the judicial or official governmental interpretation of such Laws, made after the Base Date, which affect the Contractor in the performance of obligations under the Contract.

If the Contractor suffers (or will suffer) delay and/or incurs (or will incur) additional Cost as a result of these changes in the Laws or in such interpretations, made after the Base Date, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion]; and
- b) Payment of any such Cost, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

Notwithstanding the foregoing, the Contractor shall not be entitled to an extension of time if the relevant delay has already been taken into account in the determination of a previous extension of time and such Cost shall not be separately paid if the same shall already have been taken into account in the indexing of any inputs to the table of adjustment data in accordance with the provisions of Sub-Clause 13.8 [Adjustments for Changes in Cost].

13.8 Adjustments for
Changes in costs

In this Sub-Clause, "table of adjustment data" means the completed table of adjustment data for local and foreign currencies included in the Schedules. If there is no such table of adjustment data, this Sub-Clause shall not apply.

If this Sub-Clause applies, the amounts payable to the Contractor shall be adjusted for rises or falls in the cost of labour, Goods and other inputs to the Works, by the addition or deduction of the amounts determined by the formulae prescribed in this Sub-Clause. To the extent that full compensation for any rise or fall in Costs is not covered by the provisions of this or other Clauses, the Accepted Contract Amount shall be deemed to have included amounts to cover the contingency of other rises and falls in costs.

The adjustment to be applied to the amount otherwise payable to the Contractor, as valued in accordance with the appropriate Schedule and certified in Payment Certificates, shall be determined from formulae for each of the currencies in which the Contract Price is payable. No adjustment is to be applied to work valued on the basis of Cost or current prices. The formulae shall be of the following general type:

$$P_n = a + b \frac{L_n}{L_o} + c \frac{E_n}{E_o} + d \frac{M_n}{M_o} + \dots$$

Where:

"**P_n**" is the adjustment multiplier to be applied to the estimated contract value in the relevant currency of the work carried out in period "n", this period being a month unless otherwise stated in the Contract Data;

"**a**" is a fixed coefficient, stated in the relevant table of adjustment data, representing the non-adjustable portion in contractual payments;

"**b**", "**c**", "**d**", etc. are coefficients representing the estimated proportion of each cost element related to the execution of the Works, as stated in the relevant table of adjustment data; such tabulated cost elements may be indicative of resources such as labour, equipment and materials;

"**L_n**", "**E_n**", "**M_n**", etc. are the current cost indices or reference prices for period "n", expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the date 49 days prior to the last day of the period (to which the particular Payment Certificate relates); and

"**L_o**", "**E_o**", "**M_o**", etc. are the base cost indices or reference prices, expressed in

the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the Base Date.

The cost indices or reference prices stated in the table of adjustment data shall be used. If their source is in doubt, it shall be determined by the Engineer. For this purpose, reference shall be made to the values of the indices at stated dates for the purposes of clarification of the source; although these dates (and thus these values) may not correspond to the base cost indices.

In cases where the "currency of index" is not the relevant currency of payment, each index shall be converted into the relevant currency of payment at the selling rate, established by the central bank of the Country, of this relevant currency on the above date for which the index is required to be applicable.

Until such time as each current cost index is available, the Engineer shall determine a provisional index for the issue of Interim Payment Certificates. When a current cost index is available, the adjustment shall be recalculated accordingly.

If the Contractor fails to complete the Works within the Time for Completion, adjustment of prices thereafter shall be made using either (i) each index or price applicable on the date 49 days prior to the expiry of the Time for Completion of the Works, or (ii) the current index or price, whichever is more favourable to the Employer.

The weightings (coefficients) for each of the factors of cost stated in the table(s) of adjustment data shall only be adjusted if they have been rendered unreasonable, unbalanced or inapplicable, as a result of Variations.

14 Contract Price and Payment

14.1 The Contract Price

Unless otherwise stated in the Particular Conditions:

- a) The Contract Price shall be agreed or determined under Sub-Clause 12.3 [*Evaluation*] and be subject to adjustments in accordance with the Contract;
- b) The Contractor shall pay all taxes, duties and fees required to be paid by him under the Contract, and the Contract Price shall not be adjusted for any of these costs except as stated in Sub-Clause 13.7 [*Adjustments for Changes in Legislation*];
- c) Any quantities which may be set out in the Bill of Quantities or other Schedule are estimated quantities and are not to be taken as the actual and correct quantities:
 - (i) of the Works which the Contractor is required to execute, or
 - (ii) for the purposes of Clause 12 [*Measurement and Evaluation*];and
- d) The Contractor shall submit to the Engineer, within 28 days after the Commencement Date, a proposed breakdown of each lump sum price in the Schedules. The Engineer may take account of the breakdown when preparing Payment Certificates, but shall not be bound by it.

Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts therefor, imported by the Contractor for the sole purpose of executing the Contract shall be exempt from the payment of import duties and taxes upon importation.

14.2 Advance Payment

The Employer shall make an advance payment, as an interest-free loan for mobilisation and cash flow support, when the Contractor submits a guarantee in accordance with this Sub-Clause. The total advance payment, the number and timing of instalments (if more than one), and the applicable currencies and proportions, shall be as stated in the Contract Data.

Unless and until the Employer receives this guarantee, or if the total advance payment is not stated in the Contract Data, this Sub-Clause shall not apply.

The Engineer shall deliver to the Employer and to the Contractor an Interim Payment Certificate for the advance payment or its first instalment after receiving a Statement (under Sub-Clause 14.3 [*Application for Interim Payment Certificates*]) and after the Employer receives (i) the Performance Security in accordance with Sub-Clause 4.2 [*Performance Security*] and (ii) a guarantee in amounts and currencies equal to the advance payment. This guarantee shall be

issued by a reputable bank or financial institution selected by the Contractor and shall be in the form annexed to the Particular Conditions or in another form approved by the Employer.

The Contractor shall ensure that the guarantee is valid and enforceable until the advance payment has been repaid, but its amount shall be progressively reduced by the amount repaid by the Contractor as indicated in the Payment Certificates. If the terms of the guarantee specify its expiry date, and the advance payment has not been repaid by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the guarantee until the advance payment has been repaid.

Unless stated otherwise in the Contract Data, the advance payment shall be repaid through percentage deductions from the interim payments determined by the Engineer in accordance with Sub-Clause 14.6 [*Issue of Interim Payment Certificates*], as follows:

- a) Deductions shall commence in the next interim Payment Certificate following that in which the total of all certified interim payments (excluding the advance payment and deductions and repayments of retention) exceeds 30 percent (30%) of the Accepted Contract Amount less Provisional Sums; and
- b) Deductions shall be made at the amortisation rate stated in the Contract Data of the amount of each Interim Payment Certificate (excluding the advance payment and deductions for its repayments as well as deductions for retention money) in the currencies and proportions of the advance payment until such time as the advance payment has been repaid; provided that the advance payment shall be completely repaid prior to the time when 90 percent (90%) of the Accepted Contract Amount less Provisional Sums has been certified for payment.

If the advance payment has not been repaid prior to the issue of the Taking-Over Certificate for the Works or prior to termination under Clause 15 [*Termination by Employer*], Clause 16 [*Suspension and Termination by Contractor*] or Clause 19 [*Force Majeure*] (as the case may be), the whole of the balance then outstanding shall immediately become due and in case of termination under Clause 15 [*Termination by Employer*], except for Sub-Clause 15.5 [*Employer's Entitlement to Termination for Convenience*], payable by the Contractor to the Employer.

14.3 Application for Interim Payment Certificates

The Contractor shall submit a Statement in six copies to the Engineer after the end of each month, in a form approved by the Engineer, showing in detail the amounts to which the Contractor considers himself to be entitled, together with supporting documents which shall include the report on the progress during this month in accordance with Sub-Clause 4.21 [*Progress Reports*].

The Statement shall include the following items, as applicable, which shall be expressed in the various currencies in which the Contract Price is payable, in the sequence listed:

- a) The estimated contract value of the Works executed and the Contractor's Documents produced up to the end of the month (including Variations but excluding items described in sub-paragraphs (b) to (g) below);
- b) Any amounts to be added and deducted for changes in legislation and changes in cost, in accordance with Sub-Clause 13.7 [*Adjustments for Changes in Legislation*] and Sub-Clause 13.8 [*Adjustments for Changes in Cost*];
- c) Any amount to be deducted for retention, calculated by applying the percentage of retention stated in the Contract Data to the total of the above amounts, until the amount so retained by the Employer reaches the limit of Retention Money (if any) stated in the Contract Data;
- d) Any amounts to be added for the advance payment and (if more than one instalment) and to be deducted for its repayments in accordance with Sub-Clause 14.2 [*Advance Payment*];
- e) Any amounts to be added and deducted for Plant and Materials in

accordance with Sub-Clause 14.5 [*Plant and Materials intended for the Works*];

- f) Any other additions or deductions which may have become due under the Contract or otherwise, including those under Clause 20 [*Claims, Disputes and Arbitration*]; and
- g) The deduction of amounts certified in all previous Payment Certificates.

14.4 Schedule of Payments

If the Contract includes a schedule of payments specifying the instalments in which the Contract Price will be paid, then unless otherwise stated in this schedule:

- a) The instalments quoted in this schedule of payments shall be the estimated contract values for the purposes of sub-paragraph (a) of Sub-Clause 14.3 [*Application for Interim Payment Certificates*];
- b) Sub-Clause 14.5 [*Plant and Materials intended for the Works*] shall not apply; and
- c) If these instalments are not defined by reference to the actual progress achieved in executing the Works, and if actual progress is found to be less or more than that on which this schedule of payments was based, then the Engineer may proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine revised instalments, which shall take account of the extent to which progress is less or more than that on which the instalments were previously based.

If the Contract does not include a schedule of payments, the Contractor shall submit non-binding estimates of the payments which he expects to become due during each quarterly period. The first estimate shall be submitted within 42 days after the Commencement Date. Revised estimates shall be submitted at quarterly intervals, until the Taking-Over Certificate has been issued for the Works.

14.5 Plant and Materials Intended for the Works

If this Sub-Clause applies, Interim Payment Certificates shall include, under sub-paragraph (e) of Sub-Clause 14.3, (i) an amount for Plant and Materials which have been sent to the Site for incorporation in the Permanent Works, and (ii) a reduction when the contract value of such Plant and Materials is included as part of the Permanent Works under sub-paragraph (a) of Sub-Clause 14.3 [*Application for Interim Payment Certificates*].

If the lists referred to in sub-paragraphs (b)(i) or (c)(i) below are not included in the Schedules, this Sub-Clause shall not apply.

The Engineer shall determine and certify each addition if the following conditions are satisfied:

- a) The Contractor has:
 - (i) Kept satisfactory records (including the orders, receipts, Costs and use of Plant and Materials) which are available for inspection; and
 - (ii) Submitted a statement of the Cost of acquiring and delivering the Plant and Materials to the Site, supported by satisfactory evidence;

and either:

- b) The relevant Plant and Materials:
 - (i) Are those listed in the Schedules for payment when shipped;
 - (ii) Have been shipped to the Country, en route to the Site, in accordance with the Contract; and
 - (iii) Are described in a clean shipped bill of lading or other evidence of shipment, which has been submitted to the Engineer together with evidence of payment of freight and insurance, any other documents reasonably required, and a bank guarantee in a form and issued by an entity approved by the Employer in amounts and currencies equal to the amount due under this Sub-Clause: this guarantee may be in a similar form to the form referred to in Sub-Clause 14.2 [*Advance Payment*] and shall be valid until

the Plant and Materials are properly stored on Site and protected against loss, damage or deterioration;

or:

- c) The relevant Plant and Materials:
 - (i) Are those listed in the Schedules for payment when delivered to the Site; and
 - (ii) Have been delivered to and are properly stored on the Site, are protected against loss, damage or deterioration, and appear to be in accordance with the Contract.

The additional amount to be certified shall be the equivalent of eighty percent (80%) of the Engineer's determination of the cost of the Plant and Materials (including delivery to Site), taking account of the documents mentioned in this Sub-Clause and of the contract value of the Plant and Materials.

The currencies for this additional amount shall be the same as those in which payment will become due when the contract value is included under subparagraph (a) of Sub-Clause 14.3 [*Application for Interim Payment Certificates*]. At that time, the Payment Certificate shall include the applicable reduction which shall be equivalent to, and in the same currencies and proportions as, this additional amount for the relevant Plant and Materials.

14.6 Issue of Interim Payment Certificates

No amount will be certified or paid until the Employer has received and approved the Performance Security. Thereafter, the Engineer shall, within 28 days after receiving a Statement and supporting documents, deliver to the Employer and to the Contractor an Interim Payment Certificate which shall state the amount which the Engineer fairly determines to be due, with all supporting particulars for any reduction or withholding made by the Engineer on the Statement if any.

However, prior to issuing the Taking-Over Certificate for the Works, the Engineer shall not be bound to issue an Interim Payment Certificate in an amount which would (after retention and other deductions) be less than the minimum amount of Interim Payment Certificates (if any) stated in the Contract Data. In this event, the Engineer shall give notice to the Contractor accordingly.

An Interim Payment Certificate shall not be withheld for any other reason, although:

- a) If any thing supplied or work done by the Contractor is not in accordance with the Contract, the cost of rectification or replacement may be withheld until rectification or replacement has been completed; and/or
- b) If the Contractor was or is failing to perform any work or obligation in accordance with the Contract, and had been so notified by the Engineer, the value of this work or obligation may be withheld until the work or obligation has been performed.

The Engineer may in any Payment Certificate make any correction or modification that should properly be made to any previous Payment Certificate. A Payment Certificate shall not be deemed to indicate the Engineer's acceptance, approval, consent or satisfaction.

14.7 Payment

The Employer shall pay to the Contractor:

- a) The first instalment of the advance payment within 42 days after issuing the Letter of Acceptance or within 21 days after receiving the documents in accordance with Sub-Clause 4.2 [*Performance Security*] and Sub-Clause 14.2 [*Advance Payment*], whichever is later;
- b) The amount certified in each Interim Payment Certificate within 56 days after the Engineer receives the Statement and supporting documents; or, at a time when the Bank's loan or credit (from which part of the payments to the Contractor is being made) is suspended, the amount shown on any statement submitted by the Contractor within 14 days after such statement is submitted, any discrepancy being rectified in the next payment to the Contractor; and
- c) The amount certified in the Final Payment Certificate within 56 days

after the Employer receives this Payment Certificate; or, at a time when the Bank's loan or credit (from which part of the payments to the Contractor is being made) is suspended, the undisputed amount shown in the Final Statement within 56 days after the date of notification of the suspension in accordance with Sub-Clause 16.2 [*Termination by Contractor*].

Payment of the amount due in each currency shall be made into the bank account, nominated by the Contractor, in the payment country (for this currency) specified in the Contract.

14.8 Delayed Payment

If the Contractor does not receive payment in accordance with Sub-Clause 14.7 [*Payment*], the Contractor shall be entitled to receive financing charges compounded monthly on the amount unpaid during the period of delay. This period shall be deemed to commence on the date for payment specified in Sub-Clause 14.7 [*Payment*], irrespective (in the case of its sub-paragraph (b)) of the date on which any Interim Payment Certificate is issued.

Unless otherwise stated in the Particular Conditions, these financing charges shall be calculated at the annual rate of three percentage points above the discount rate of the central bank in the country of the currency of payment, or if not available, the interbank offered rate, and shall be paid in such currency.

The Contractor shall be entitled to this payment without formal notice or certification, and without prejudice to any other right or remedy.

14.9 Payment or Retention Money

When the Taking-Over Certificate has been issued for the Works, the first half of the Retention Money shall be certified by the Engineer for payment to the Contractor. If a Taking-Over Certificate is issued for a Section or part of the Works, a proportion of the Retention Money shall be certified and paid. This proportion shall be half (50%) of the proportion calculated by dividing the estimated contract value of the Section or part, by the estimated final Contract Price.

Promptly after the latest of the expiry dates of the Defects Notification Periods, the outstanding balance of the Retention Money shall be certified by the Engineer for payment to the Contractor. If a Taking-Over Certificate was issued for a Section, a proportion of the second half of the Retention Money shall be certified and paid promptly after the expiry date of the Defects Notification Period for the Section. This proportion shall be half (50%) of the proportion calculated by dividing the estimated contract value of the Section by the estimated final Contract Price.

However, if any work remains to be executed under Clause 11 [*Defects Liability*], the Engineer shall be entitled to withhold certification of the estimated cost of this work until it has been executed.

When calculating these proportions, no account shall be taken of any adjustments under Sub-Clause 13.7 [*Adjustments for Changes in Legislation*] and Sub-Clause 13.8 [*Adjustments for Changes in Cost*].

Unless otherwise stated in the Particular Conditions, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment by the Engineer, the Contractor shall be entitled to substitute a guarantee, in the form annexed to the Particular Conditions or in another form approved by the Employer and issued by a reputable bank or financial institution selected by the Contractor, for the second half of the Retention Money. The Contractor shall ensure that the guarantee is in the amounts and currencies of the second half of the Retention Money and is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects, as specified for the Performance Security in Sub-Clause 4.2. On receipt by the Employer of the required guarantee, the Engineer shall certify and the Employer shall pay the second half of the Retention Money. The release of the second half of the Retention Money against a guarantee shall then be in lieu of the release under the second paragraph of this Sub-Clause. The Employer shall return the guarantee to the Contractor within 21 days after receiving a copy of the Performance Certificate.

If the Performance Security required under Sub-Clause 4.2 is in the form of a demand guarantee, and the amount guaranteed under it when the Taking-Over

Certificate is issued is more than half of the Retention Money, then the Retention Money guarantee will not be required. If the amount guaranteed under the Performance Security when the Taking-Over Certificate is issued is less than half of the Retention Money, the Retention Money guarantee will only be required for the difference between half of the Retention Money and the amount guaranteed under the Performance Security.

14.10 Statement at Completion

Within 84 days after receiving the Taking-Over Certificate for the Works, the Contractor shall submit to the Engineer six copies of a Statement at completion with supporting documents, in accordance with Sub-Clause 14.3 [*Application for Interim Payment Certificates*], showing:

- a) The value of all work done in accordance with the Contract up to the date stated in the Taking-Over Certificate for the Works;
- b) Any further sums which the Contractor considers to be due; and
- c) An estimate of any other amounts which the Contractor considers will become due to him under the Contract. Estimated amounts shall be shown separately in this Statement at completion.

The Engineer shall then certify in accordance with Sub-Clause 14.6 [*Issue of Interim Payment Certificates*].

14.11 Application for Final Payment Certificate

Within 56 days after receiving the Performance Certificate, the Contractor shall submit, to the Engineer, six copies of a draft final statement with supporting documents showing in detail in a form approved by the Engineer:

- a) The value of all work done in accordance with the Contract; and
- b) Any further sums which the Contractor considers to be due to him under the Contract or otherwise.

If the Engineer disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Engineer may reasonably require within 28 days from receipt of said draft and shall make such changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Engineer the final statement as agreed. This agreed statement is referred to in these Conditions as the "Final Statement".

However, if following discussions between the Engineer and the Contractor and any changes to the draft final statement which are agreed, it becomes evident that a dispute exists, the Engineer shall deliver to the Employer (with a copy to the Contractor) an Interim Payment Certificate for the agreed parts of the draft final statement. Thereafter, if the dispute is finally resolved under Sub-Clause 20.4 [*Obtaining Dispute Board's Decision*] or Sub-Clause 20.5 [*Amicable Settlement*], the Contractor shall then prepare and submit to the Employer (with a copy to the Engineer) a Final Statement.

14.12 Discharge

When submitting the Final Statement, the Contractor shall submit a discharge which confirms that the total of the Final Statement represents full and final settlement of all moneys due to the Contractor under or in connection with the Contract. This discharge may state that it becomes effective when the Contractor has received the Performance Security and the outstanding balance of this total, in which event the discharge shall be effective on such date.

14.13 Issue of Final Payment Certificate

Within 28 days after receiving the Final Statement and discharge in accordance with Sub-Clause 14.11 [*Application for Final Payment Certificate*] and Sub-Clause 14.12 [*Discharge*], the Engineer shall deliver, to the Employer and to the Contractor, the Final Payment Certificate which shall state:

- a) The amount which he fairly determines is finally due; and
- b) After giving credit to the Employer for all amounts previously paid by the Employer and for all sums to which the Employer is entitled, the balance (if any) due from the Employer to the Contractor or from the Contractor to the Employer, as the case may be.

If the Contractor has not applied for a Final Payment Certificate in accordance with Sub-Clause 14.11 [*Application for Final Payment Certificate*] and Sub-Clause 14.12 [*Discharge*], the Engineer shall request the Contractor to do so. If the Contractor fails to submit an application within a period of 28 days, the Engineer shall issue the Final Payment Certificate for such amount as he fairly

determines to be due.

14.14 Cessation of Employer's Liability

The Employer shall not be liable to the Contractor for any matter or thing under or in connection with the Contract or execution of the Works, except to the extent that the Contractor shall have included an amount expressly for it:

- a) In the Final Statement; and also
- b) (Except for matters or things arising after the issue of the Taking-Over Certificate for the Works) in the Statement at completion described in Sub-Clause 14.10 [*Statement at Completion*].

However, this Sub-Clause shall not limit the Employer's liability under his indemnification obligations, or the Employer's liability in any case of fraud, deliberate default or reckless misconduct by the Employer.

14.15 Currencies of Payment

The Contract Price shall be paid in the currency or currencies named in the Schedule of Payment Currencies. If more than one currency is so named, payments shall be made as follows:

- a) If the Accepted Contract Amount was expressed in Local Currency only:
 - (i) The proportions or amounts of the Local and Foreign Currencies, and the fixed rates of exchange to be used for calculating the payments, shall be as stated in the Schedule of Payment Currencies, except as otherwise agreed by both Parties;
 - (ii) Payments and deductions under Sub-Clause 13.5 [*Provisional Sums*] and Sub-Clause 13.7 [*Adjustments for Changes in Legislation*] shall be made in the applicable currencies and proportions; and
 - (iii) Other payments and deductions under sub-paragraphs (a) to (d) of Sub-Clause 14.3 [*Application for Interim Payment Certificates*] shall be made in the currencies and proportions specified in sub-paragraph (a)(i) above;
- b) Payment of the damages specified in the Contract Data, shall be made in the currencies and proportions specified in the Schedule of Payment Currencies;
- c) Other payments to the Employer by the Contractor shall be made in the currency in which the sum was expended by the Employer, or in such currency as may be agreed by both Parties;
- d) If any amount payable by the Contractor to the Employer in a particular currency exceeds the sum payable by the Employer to the Contractor in that currency, the Employer may recover the balance of this amount from the sums otherwise payable to the Contractor in other currencies; and
- e) If no rates of exchange are stated in the Schedule of Payment Currencies, they shall be those prevailing on the Base Date and determined by the central bank of the Country.

15 Termination by Employer

15.1 Notice to Correct

If the Contractor fails to carry out any obligation under the Contract, the Engineer may by notice require the Contractor to make good the failure and to remedy it within a specified reasonable time.

15.2 Termination by Employer

The Employer shall be entitled to terminate the Contract if the Contractor:

- a) Fails to comply with Sub-Clause 4.2 [*Performance Security*] or with a notice under Sub-Clause 15.1 [*Notice to Correct*];
- b) Abandons the Works or otherwise plainly demonstrates the intention not to continue performance of his obligations under the Contract;
- c) Without reasonable excuse fails:
 - (i) To proceed with the Works in accordance with Clause 8 [*Commencement, Delays and Suspension*]; or
 - (ii) To comply with a notice issued under Sub-Clause 7.5 [*Rejection*] or Sub-Clause 7.6 [*Remedial Work*], within 28 days after

receiving it;

- d) Subcontracts the whole of the Works or assigns the Contract without the required agreement;
- e) Becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events; or
- f) Gives or offers to give (directly or indirectly) to any person any bribe, gift, gratuity, commission or other thing of value, as an inducement or reward:
 - (i) For doing or forbearing to do any action in relation to the Contract; or
 - (ii) For showing or forbearing to show favour or disfavour to any person in relation to the Contract,

or if any of the Contractor's Personnel, agents or Subcontractors gives or offers to give (directly or indirectly) to any person any such inducement or reward as is described in this sub-paragraph (f). However, lawful inducements and rewards to Contractor's Personnel shall not entitle termination.

In any of these events or circumstances, the Employer may, upon giving 14 days' notice to the Contractor, terminate the Contract and expel the Contractor from the Site. However, in the case of sub-paragraph (e) or (f), the Employer may by notice terminate the Contract immediately.

The Employer's election to terminate the Contract shall not prejudice any other rights of the Employer, under the Contract or otherwise.

The Contractor shall then leave the Site and deliver any required Goods, all Contractor's Documents, and other design documents made by or for him, to the Engineer. However, the Contractor shall use his best efforts to comply immediately with any reasonable instructions included in the notice (i) for the assignment of any subcontract, and (ii) for the protection of life or property or for the safety of the Works.

After termination, the Employer may complete the Works and/or arrange for any other entities to do so. The Employer and these entities may then use any Goods, Contractor's Documents and other design documents made by or on behalf of the Contractor.

The Employer shall then give notice that the Contractor's Equipment and Temporary Works will be released to the Contractor at or near the Site. The Contractor shall promptly arrange their removal, at the risk and cost of the Contractor. However, if by this time the Contractor has failed to make a payment due to the Employer, these items may be sold by the Employer in order to recover this payment. Any balance of the proceeds shall then be paid to the Contractor.

15.3 Valuation at Date of Termination

As soon as practicable after a notice of termination under Sub-Clause 15.2 [*Termination by Employer*] has taken effect, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine the value of the Works, Goods and Contractor's Documents, and any other sums due to the Contractor for work executed in accordance with the Contract.

15.4 Payment after Termination

After a notice of termination under Sub-Clause 15.2 [*Termination by Employer*] has taken effect, the Employer may:

- a) Proceed in accordance with Sub-Clause 2.5 [*Employer's Claims*];
- b) Withhold further payments to the Contractor until the costs of execution, completion and remedying of any defects, damages for delay in completion (if any), and all other costs incurred by the Employer, have been established; and/or
- c) Recover from the Contractor any losses and damages incurred by the Employer and any extra costs of completing the Works, after allowing for any sum due to the Contractor under Sub-Clause 15.3 [*Valuation at Date of Termination*]. After recovering any such losses, damages and

extra costs, the Employer shall pay any balance to the Contractor.

- 15.5 Employer's Entitlement to Termination for Convenience
- The Employer shall be entitled to terminate the Contract, at any time for the Employer's convenience, by giving notice of such termination to the Contractor. The termination shall take effect 28 days after the later of the dates on which the Contractor receives this notice or the Employer returns the Performance Security. The Employer shall not terminate the Contract under this Sub-Clause in order to execute the Works himself or to arrange for the Works to be executed by another contractor or to avoid a termination of the Contract by the Contractor under Clause 16.2 *[Termination by Contractor]*.
- After this termination, the Contractor shall proceed in accordance with Sub-Clause 16.3 *[Cessation of Work and Removal of Contractor's Equipment]* and shall be paid in accordance with Sub-Clause 16.4 *[Payment on Termination]*.
- 15.6 Corrupt or fraudulent Practices
- If the Employer determines, based on reasonable evidence, that the Contractor has engaged in corrupt, fraudulent, collusive or coercive practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days' notice to the Contractor, terminate the Contract and expel him from the Site, and the provisions of Clause 15 shall apply as if such termination had been made under Sub-Clause 15.2 *[Termination by Employer]*.
- Should any employee of the Contractor be determined, based on reasonable evidence, to have engaged in corrupt, fraudulent or coercive practice during the execution of the work then that employee shall be removed in accordance with Sub-Clause 6.9 *[Contractor's Personnel]*.
- For the purposes of this Sub-Clause:
- a) "**Corrupt practice**" is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
 - b) "**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;
 - c) "**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;
 - d) "**Coercive practice**" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
 - e) "**Obstructive practice**" is:
 - (i) Deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or
 - (ii) Acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under Sub-Clause 1.15 *[Inspections and Audits by the Bank]*.

16 Suspension and Termination by Contractor

- 16.1 Contractor's Entitlement to Suspend Work
- If the Engineer fails to certify in accordance with Sub-Clause 14.6 *[Issue of Interim Payment Certificates]* or the Employer fails to comply with Sub-Clause 2.4 *[Employer's Financial Arrangements]* or Sub-Clause 14.7 *[Payment]*, the Contractor may, after giving not less than 21 days' notice to the Employer, suspend work (or reduce the rate of work) unless and until the Contractor has received the Payment Certificate, reasonable evidence or payment, as the case may be and as described in the notice.
- Notwithstanding the above, if the Bank has suspended disbursements under the loan or credit from which payments to the Contractor are being made, in whole or in part, for the execution of the Works, and no alternative funds are

available as provided for in Sub-Clause 2.4 [*Employer's Financial Arrangements*], the Contractor may by notice suspend work or reduce the rate of work at any time, but not less than 7 days after the Borrower having received the suspension notification from the Bank.

The Contractor's action shall not prejudice his entitlements to financing charges under Sub-Clause 14.8 [*Delayed Payment*] and to termination under Sub-Clause 16.2 [*Termination by Contractor*].

If the Contractor subsequently receives such Payment Certificate, evidence or payment (as described in the relevant Sub-Clause and in the above notice) before giving a notice of termination, the Contractor shall resume normal working as soon as is reasonably practicable.

If the Contractor suffers delay and/or incurs Cost as a result of suspending work (or reducing the rate of work) in accordance with this Sub-Clause, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*]; and
- b) Payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

16.2 Termination by Contractor

The Contractor shall be entitled to terminate the Contract if:

- a) The Contractor does not receive the reasonable evidence within 42 days after giving notice under Sub-Clause 16.1 [*Contractor's Entitlement to Suspend Work*] in respect of a failure to comply with Sub-Clause 2.4 [*Employer's Financial Arrangements*];
- b) The Engineer fails, within 56 days after receiving a Statement and supporting documents, to issue the relevant Payment Certificate;
- c) The Contractor does not receive the amount due under an Interim Payment Certificate within 42 days after the expiry of the time stated in Sub-Clause 14.7 [*Payment*] within which payment is to be made (except for deductions in accordance with Sub-Clause 2.5 [*Employer's Claims*]);
- d) The Employer substantially fails to perform his obligations under the Contract in such manner as to materially and adversely affect the economic balance of the Contract and/or the ability of the Contractor to perform the Contract;
- e) The Employer fails to comply with Sub-Clause 1.6 [*Contract Agreement*] or Sub-Clause 1.7 [*Assignment*];
- f) A prolonged suspension affects the whole of the Works as described in Sub-Clause 8.11 [*Prolonged Suspension*]; or
- g) The Employer becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events;
- h) The Contractor does not receive the Engineer's instruction recording the agreement of both Parties on the fulfilment of the conditions for the Commencement of Works under Sub-Clause 8.1 [*Commencement of Works*].

In any of these events or circumstances, the Contractor may, upon giving 14 days' notice to the Employer, terminate the Contract. However, in the case of sub-paragraph (f) or (g), the Contractor may by notice terminate the Contract immediately.

In the event the Bank suspends the loan or credit from which part or whole of the payments to the Contractor are being made, if the Contractor has not received the sums due to him upon expiration of the 14 days referred to in Sub-Clause 14.7 [*Payment*] for payments under Interim Payment Certificates, the Contractor may, without prejudice to the Contractor's entitlement to financing charges under Sub-Clause 14.8 [*Delayed Payment*], take one of the

following actions, namely (i) suspend work or reduce the rate of work under Sub-Clause 16.1 above, or (ii) terminate the Contract by giving notice to the Employer, with a copy to the Engineer, such termination to take effect 14 days after the giving of the notice.

The Contractor's election to terminate the Contract shall not prejudice any other rights of the Contractor, under the Contract or otherwise.

16.3 Cessation of Work and Removal of Contractor's Equipment

After a notice of termination under Sub-Clause 15.5 [*Employer's Entitlement to Termination for Convenience*], Sub-Clause 16.2 [*Termination by Contractor*] or Sub-Clause 19.6 [*Optional Termination, Payment and Release*] has taken effect, the Contractor shall promptly:

- a) Cease all further work, except for such work as may have been instructed by the Engineer for the protection of life or property or for the safety of the Works;
- b) Hand over Contractor's Documents, Plant, Materials and other work, for which the Contractor has received payment; and
- c) Remove all other Goods from the Site, except as necessary for safety, and leave the Site.

16.4 Payment on Termination

After a notice of termination under Sub-Clause 16.2 [*Termination by Contractor*] has taken effect, the Employer shall promptly:

- a) Return the Performance Security to the Contractor;
- b) Pay the Contractor in accordance with Sub-Clause 19.6 [*Optional Termination, Payment and Release*]; and
- c) Pay to the Contractor the amount of any loss or damage sustained by the Contractor as a result of this termination.

17 Risk and Responsibility

17.1 Indemnities

The Contractor shall indemnify and hold harmless the Employer, the Employer's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of:

- a) Bodily injury, sickness, disease or death, of any person whatsoever arising out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, unless attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, or any of their respective agents; and
- b) Damage to or loss of any property, real or personal (other than the Works), to the extent that such damage or loss arises out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, unless and to the extent that any such damage or loss is attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, their respective agents, or anyone directly or indirectly employed by any of them.

The Employer shall indemnify and hold harmless the Contractor, the Contractor's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of (1) bodily injury, sickness, disease or death, which is attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, or any of their respective agents, and (2) the matters for which liability may be excluded from insurance cover, as described in subparagraphs (d)(i), (ii) and (iii) of Sub-Clause 18.3 [*Insurance Against Injury to Persons and Damage to Property*].

17.2 Contractor's Care of the Works

The Contractor shall take full responsibility for the care of the Works and Goods from the Commencement Date until the Taking-Over Certificate is issued (or is deemed to be issued under Sub-Clause 10.1 [*Taking Over of the Works and Sections*]) for the Works, when responsibility for the care of the Works shall pass to the Employer. If a Taking-Over Certificate is issued (or is so deemed to be issued) for any Section or part of the Works, responsibility for the care of the Section or part shall then pass to the Employer.

After responsibility has accordingly passed to the Employer, the Contractor

shall take responsibility for the care of any work which is outstanding on the date stated in a Taking-Over Certificate, until this outstanding work has been completed.

If any loss or damage happens to the Works, Goods or Contractor's Documents during the period when the Contractor is responsible for their care, from any cause not listed in Sub-Clause 17.3 [*Employer's Risks*], the Contractor shall rectify the loss or damage at the Contractor's risk and cost, so that the Works, Goods and Contractor's Documents conform with the Contract.

The Contractor shall be liable for any loss or damage caused by any actions performed by the Contractor after a Taking-Over Certificate has been issued. The Contractor shall also be liable for any loss or damage which occurs after a Taking-Over Certificate has been issued and which arose from a previous event for which the Contractor was liable.

17.3 Employer's Risks

The risks referred to in Sub-Clause 17.4 [*Consequences of Employer's Risks*] below, insofar as they directly affect the execution of the Works in the Country, are:

- 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, within the Country;
- c) Riot, commotion or disorder within the Country by persons other than the Contractor's Personnel;
- d) Munitions of war, explosive materials, ionising radiation or contamination by radio-activity, within the Country, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity;
- e) Pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds;
- f) Use or occupation by the Employer of any part of the Permanent Works, except as may be specified in the Contract;
- g) Design of any part of the Works by the Employer's Personnel or by others for whom the Employer is responsible; and
- h) Any operation of the forces of nature which is Unforeseeable or against which an experienced contractor could not reasonably have been expected to have taken adequate preventive precautions.

17.4 Consequences of Employer's Risks

If and to the extent that any of the risks listed in Sub-Clause 17.3 above results in loss or damage to the Works, Goods or Contractor's Documents, the Contractor shall promptly give notice to the Engineer and shall rectify this loss or damage to the extent required by the Engineer.

If the Contractor suffers delay and/or incurs Cost from rectifying this loss or damage, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*]; and
- b) Payment of any such Cost, which shall be included in the Contract Price. In the case of sub-paragraphs (f) and (g) of Sub-Clause 17.3 [*Employer's Risks*], Cost plus profit shall be payable.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

17.5 Intellectual and Industrial Property Right

In this Sub-Clause, "infringement" means an infringement (or alleged infringement) of any patent, registered design, copyright, trade mark, trade name, trade secret or other intellectual or industrial property right relating to the Works; and "claim" means a claim (or proceedings pursuing a claim) alleging an infringement.

Whenever a Party does not give notice to the other Party of any claim within 28 days of receiving the claim, the first Party shall be deemed to have waived any right to indemnity under this Sub-Clause.

The Employer shall indemnify and hold the Contractor harmless against and from any claim alleging an infringement which is or was:

- a) An unavoidable result of the Contractor's compliance with the Contract; or
- b) A result of any Works being used by the Employer:
 - (i) For a purpose other than that indicated by, or reasonably to be inferred from, the Contract; or
 - (ii) In conjunction with anything not supplied by the Contractor, unless such use was disclosed to the Contractor prior to the Base Date or is stated in the Contract.

The Contractor shall indemnify and hold the Employer harmless against and from any other claim which arises out of or in relation to (i) the manufacture, use, sale or import of any Goods, or (ii) any design for which the Contractor is responsible.

If a Party is entitled to be indemnified under this Sub-Clause, the indemnifying Party may (at its cost) conduct negotiations for the settlement of the claim, and any litigation or arbitration which may arise from it. The other Party shall, at the request and cost of the indemnifying Party, assist in contesting the claim. This other Party (and its Personnel) shall not make any admission which might be prejudicial to the indemnifying Party, unless the indemnifying Party failed to take over the conduct of any negotiations, litigation or arbitration upon being requested to do so by such other Party.

17.6 Limitation of Liability

Neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract, other than as specifically provided in Sub-Clause 8.7 [*Delay Damages*]; Sub-Clause 11.2 [*Cost of Remedying Defects*]; Sub-Clause 15.4 [*Payment after Termination*]; Sub-Clause 16.4 [*Payment on Termination*]; Sub-Clause 17.1 [*Indemnities*]; Sub-Clause 17.4(b) [*Consequences of Employer's Risks*] and Sub-Clause 17.5 [*Intellectual and Industrial Property Rights*].

The total liability of the Contractor to the Employer, under or in connection with the Contract other than under Sub-Clause 4.19 [*Electricity, Water and Gas*], Sub-Clause 4.20 [*Employer's Equipment and Free-Issue Materials*], Sub-Clause 17.1 [*Indemnities*] and Sub-Clause 17.5 [*Intellectual and Industrial Property Rights*], shall not exceed the sum resulting from the application of a multiplier (less or greater than one) to the Accepted Contract Amount, as stated in the Contract Data, or (if such multiplier or other sum is not so stated) the Accepted Contract Amount.

This Sub-Clause shall not limit liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party.

17.7 Use of Employer's Accommodation / Facilities

The Contractor shall take full responsibility for the care of the Employer provided accommodation and facilities, if any, as detailed in the Specification, from the respective dates of hand-over to the Contractor until cessation of occupation (where hand-over or cessation of occupation may take place after the date stated in the Taking-Over Certificate for the Works).

If any loss or damage happens to any of the above items while the Contractor is responsible for their care arising from any cause whatsoever other than those for which the Employer is liable, the Contractor shall, at his own cost, rectify the loss or damage to the satisfaction of the Engineer.

18 Insurances

18.1 General Requirements for Insurances

In this Clause, "insuring Party" means, for each type of insurance, the Party responsible for effecting and maintaining the insurance specified in the relevant Sub-Clause.

Wherever the Contractor is the insuring Party, each insurance shall be effected with insurers and in terms approved by the Employer. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.

Wherever the Employer is the insuring Party, each insurance shall be effected with insurers and in terms acceptable to the Contractor. These terms shall be

consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.

If a policy is required to indemnify joint insured, the cover shall apply separately to each insured as though a separate policy had been issued for each of the joint insured. If a policy indemnifies additional joint insured, namely in addition to the insured specified in this Clause, (i) the Contractor shall act under the policy on behalf of these additional joint insured except that the Employer shall act for Employer's Personnel, (ii) additional joint insured shall not be entitled to receive payments directly from the insurer or to have any other direct dealings with the insurer, and (iii) the insuring Party shall require all additional joint insured to comply with the conditions stipulated in the policy.

Each policy insuring against loss or damage shall provide for payments to be made in the currencies required to rectify the loss or damage. Payments received from insurers shall be used for the rectification of the loss or damage.

The relevant insuring Party shall, within the respective periods stated in the Contract Data (calculated from the Commencement Date), submit to the other Party:

- a) Evidence that the insurances described in this Clause have been effected; and
- b) Copies of the policies for the insurances described in Sub-Clause 18.2 [*Insurance for Works and Contractor's Equipment*] and Sub-Clause 18.3 [*Insurance against Injury to Persons and Damage to Property*].

When each premium is paid, the insuring Party shall submit evidence of payment to the other Party. Whenever evidence or policies are submitted, the insuring Party shall also give notice to the Engineer.

Each Party shall comply with the conditions stipulated in each of the insurance policies. The insuring Party shall keep the insurers informed of any relevant changes to the execution of the Works and ensure that insurance is maintained in accordance with this Clause.

Neither Party shall make any material alteration to the terms of any insurance without the prior approval of the other Party. If an insurer makes (or attempts to make) any alteration, the Party first notified by the insurer shall promptly give notice to the other Party.

If the insuring Party fails to effect and keep in force any of the insurances it is required to effect and maintain under the Contract, or fails to provide satisfactory evidence and copies of policies in accordance with this Sub-Clause, the other Party may (at its option and without prejudice to any other right or remedy) effect insurance for the relevant coverage and pay the premiums due. The insuring Party shall pay the amount of these premiums to the other Party, and the Contract Price shall be adjusted accordingly.

Nothing in this Clause limits the obligations, liabilities or responsibilities of the Contractor or the Employer, under the other terms of the Contract or otherwise. Any amounts not insured or not recovered from the insurers shall be borne by the Contractor and/or the Employer in accordance with these obligations, liabilities or responsibilities. However, if the insuring Party fails to effect and keep in force an insurance which is available and which it is required to effect and maintain under the Contract, and the other Party neither approves the omission nor effects insurance for the coverage relevant to this default, any moneys which should have been recoverable under this insurance shall be paid by the insuring Party.

Payments by one Party to the other Party shall be subject to Sub-Clause 2.5 [*Employer's Claims*] or Sub-Clause 20.1 [*Contractor's Claims*], as applicable.

The Contractor shall be entitled to place all insurance relating to the Contract (including, but not limited to the insurance referred to Clause 18) with insurers from any eligible source country.

18.2 Insurance for Works and Contractor's Equipment

The insuring Party shall insure the Works, Plant, Materials and Contractor's Documents for not less than the full reinstatement cost including the costs of demolition, removal of debris and professional fees and profit. This insurance

shall be effective from the date by which the evidence is to be submitted under sub-paragraph (a) of Sub-Clause 18.1 [*General Requirements for Insurances*], until the date of issue of the Taking-Over Certificate for the Works.

The insuring Party shall maintain this insurance to provide cover until the date of issue of the Performance Certificate, for loss or damage for which the Contractor is liable arising from a cause occurring prior to the issue of the Taking-Over Certificate, and for loss or damage caused by the Contractor in the course of any other operations (including those under Clause 11 [*Defects Liability*]).

The insuring Party shall insure the Contractor's Equipment for not less than the full replacement value, including delivery to Site. For each item of Contractor's Equipment, the insurance shall be effective while it is being transported to the Site and until it is no longer required as Contractor's Equipment.

Unless otherwise stated in the Particular Conditions, insurances under this Sub-Clause:

- a) Shall be effected and maintained by the Contractor as insuring Party;
- b) Shall be in the joint names of the Parties, who shall be jointly entitled to receive payments from the insurers, payments being held or allocated to the Party actually bearing the costs of rectifying the loss or damage,
- c) Shall cover all loss and damage from any cause not listed in Sub-Clause 17.3 [*Employer's Risks*];
- d) Shall also cover, to the extent specifically required in the bidding documents of the Contract, loss or damage to a part of the Works which is attributable to the use or occupation by the Employer of another part of the Works, and loss or damage from the risks listed in sub-paragraphs (c), (g) and (h) of Sub-Clause 17.3 [*Employer's Risks*], excluding (in each case) risks which are not insurable at commercially reasonable terms, with deductibles per occurrence of not more than the amount stated in the Contract Data (if an amount is not so stated, this sub-paragraph (d) shall not apply); and
- e) May however exclude loss of, damage to, and reinstatement of:
 - (i) A part of the Works which is in a defective condition due to a defect in its design, materials or workmanship (but cover shall include any other parts which are lost or damaged as a direct result of this defective condition and not as described in sub-paragraph (ii) below);
 - (ii) A part of the Works which is lost or damaged in order to reinstate any other part of the Works if this other part is in a defective condition due to a defect in its design, materials or workmanship;
 - (iii) A part of the Works which has been taken over by the Employer, except to the extent that the Contractor is liable for the loss or damage; and
 - (iv) Goods while they are not in the Country, subject to Sub-Clause 14.5 [*Plant and Materials intended for the Works*].

If, more than one year after the Base Date, the cover described in sub-paragraph (d) above ceases to be available at commercially reasonable terms, the Contractor shall (as insuring Party) give notice to the Employer, with supporting particulars. The Employer shall then (i) be entitled subject to Sub-Clause 2.5 [*Employer's Claims*] to payment of an amount equivalent to such commercially reasonable terms as the Contractor should have expected to have paid for such cover, and (ii) be deemed, unless he obtains the cover at commercially reasonable terms, to have approved the omission under Sub-Clause 18.1 [*General Requirements for Insurances*].

18.3 Insurance against
Injury to Persons and
Damages to Property

The insuring Party shall insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Sub-Clause 18.2 [*Insurance for Works and Contractor's Equipment*]) or to any person (except persons insured under Sub-Clause 18.4 [*Insurance for Contractor's Personnel*]), which may arise out of the Contractor's performance of the Contract and occurring before the issue of the

Performance Certificate.

This insurance shall be for a limit per occurrence of not less than the amount stated in the Contract Data, with no limit on the number of occurrences. If an amount is not stated in the Contract Data, this Sub-Clause shall not apply.

Unless otherwise stated in the Particular Conditions, the insurances specified in this Sub-Clause:

- a) Shall be effected and maintained by the Contractor as insuring Party;
- b) Shall be in the joint names of the Parties;
- c) Shall be extended to cover liability for all loss and damage to the Employer's property (except things insured under Sub-Clause 18.2) arising out of the Contractor's performance of the Contract; and
- d) May however exclude liability to the extent that it arises from:
 - (i) The Employer's right to have the Permanent Works executed on, over, under, in or through any land, and to occupy this land for the Permanent Works;
 - (ii) Damage which is an unavoidable result of the Contractor's obligations to execute the Works and remedy any defects; and
 - (iii) A cause listed in Sub-Clause 17.3 [*Employer's Risks*], except to the extent that cover is available at commercially reasonable terms.

18.4 Insurance for Contractor's Personnel

The Contractor shall effect and maintain insurance against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel.

The insurance shall cover the Employer and the Engineer against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Employer or of the Employer's Personnel.

The insurance shall be maintained in full force and effect during the whole time that these personnel are assisting in the execution of the Works. For a Subcontractor's employees, the insurance may be effected by the Subcontractor, but the Contractor shall be responsible for compliance with this Clause.

19 Force Majeure

19.1 Definition of Force Majeure

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.

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:

- (i) War, hostilities (whether war be declared or not), invasion, act of foreign enemies;
- (ii) Rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war;
- (iii) Riot, commotion, disorder, strike or lockout by persons other than the Contractor's Personnel;
- (iv) Munitions of war, explosive materials, ionising 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

- (v) Natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.

- 19.2 Notice of Force Majeure 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.
- The Party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them.
- 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.
- 19.3 Duty to Minimise Delay Each Party shall at all times use all reasonable endeavours to minimise any delay in the performance of the Contract as a result of Force Majeure.
- A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.
- 19.4 Consequences of Force Majeure If the Contractor is prevented from performing his substantial obligations under the Contract by Force Majeure of which notice has been given under Sub-Clause 19.2 [*Notice of Force Majeure*], and suffers delay and/or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:
- a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*]; and
 - b) If the event or circumstance is of the kind described in sub-paragraphs (i) to (iv) of Sub-Clause 19.1 [*Definition of Force Majeure*] and, in sub-paragraphs (ii) to (iv), occurs in the Country, payment of any such Cost, including the costs of rectifying or replacing the Works and/or Goods damaged or destroyed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in Sub-Clause 18.2 [*Insurance for Works and Contractor's Equipment*].
- After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.
- 19.5 Force Majeure Affecting Subcontractor 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 non-performance or entitle him to relief under this Clause.
- 19.6 Optional Termination, Payment and Release 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 Sub-Clause 19.2 [*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 Sub-Clause 16.3 [*Cessation of Work and Removal of Contractor's Equipment*].
- Upon such termination, the Engineer 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 Cost 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 labour employed wholly in connection with the Works at the date of termination.

19.7 Release from Performance

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 fulfil 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 Sub-Clause 19.6 [*Optional Termination, Payment and Release*] if the Contract had been terminated under Sub-Clause 19.6.

20 Claims, Disputes and Arbitration

20.1 Contractor's Claims

If the Contractor considers himself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Engineer, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.

If the Contractor fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub-Clause shall apply.

The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another location acceptable to the Engineer. Without admitting the Employer's liability, the Engineer may, after receiving any notice under this Sub-Clause, monitor the record-keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Engineer to inspect all these records, and shall (if instructed) submit copies to the Engineer.

Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Engineer, the Contractor shall send to the Engineer a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:

- a) This fully detailed claim shall be considered as interim;
- b) The Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/or amount claimed, and such further particulars as the Engineer may reasonably require; and
- c) The Contractor shall send a final claim within 28 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the Engineer.

Within 42 days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Engineer and approved by the Contractor, the Engineer shall respond with

approval, or with disapproval and detailed comments. He may also request any necessary further particulars, but shall nevertheless give his response on the principles of the claim within the above defined time period.

Within the above defined period of 42 days, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with Sub-Clause 8.4 [*Extension of Time for Completion*], and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.

Each Payment Certificate shall include such additional payment for any claim as has been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.

If the Engineer does not respond within the timeframe defined in this Clause, either Party may consider that the claim is rejected by the Engineer and any of the Parties may refer to the Dispute Board in accordance with Sub-Clause 20.4 [*Obtaining Dispute Board's Decision*].

The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Sub-Clause in relation to any claim, any extension of time and/or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause.

20.2 Appointment of the Dispute Board

Disputes shall be referred to a DB for decision in accordance with Sub-Clause 20.4 [*Obtaining Dispute Board's Decision*]. The Parties shall appoint a DB by the date stated in the Contract Data.

The DB shall comprise, as stated in the Contract Data, either one or three suitably qualified persons ("the members"), each of whom shall be fluent in the language for communication defined in the Contract and shall be a professional experienced in the type of construction involved in the Works and with the interpretation of contractual documents. If the number is not so stated and the Parties do not agree otherwise, the DB shall comprise three persons.

If the Parties have not jointly appointed the DB 21 days before the date stated in the Contract Data and the DB is to comprise three persons, each Party shall nominate one member for the approval of the other Party. The first two members shall recommend and the Parties shall agree upon the third member, who shall act as chairman.

However, if a list of potential members has been agreed by the Parties and is included in the Contract, the members shall be selected from those on the list, other than anyone who is unable or unwilling to accept appointment to the DB.

The agreement between the Parties and either the sole member or each of the three members shall incorporate by reference the General Conditions of Dispute Board Agreement contained in the Appendix to these General Conditions, with such amendments as are agreed between them.

The terms of the remuneration of either the sole member or each of the three members, including the remuneration of any expert whom the DB consults, shall be mutually agreed upon by the Parties when agreeing the terms of appointment. Each Party shall be responsible for paying one-half of this remuneration

If at any time the Parties so agree, they may jointly refer a matter to the DB for it to give its opinion. Neither Party shall consult the DB on any matter without the agreement of the other Party.

If a member declines to act or is unable to act as a result of death, disability, resignation or termination of appointment, a replacement shall be appointed in the same manner as the replaced person was required to have been nominated or agreed upon, as described in this Sub-Clause.

The appointment of any member may be terminated by mutual agreement of both Parties, but not by the Employer or the Contractor acting alone. Unless otherwise agreed by both Parties, the appointment of the DB (including each

member) shall expire when the discharge referred to in Sub-Clause 14.12 *[Discharge]* shall have become effective.

20.3 Failure to Agree on the Composition of the Dispute Board

If any of the following conditions apply, namely:

- a) The Parties fail to agree upon the appointment of the sole member of the DB by the date stated in the first paragraph of Sub-Clause 20.2 *[Appointment of the Dispute Board]*;
- b) Either Party fails to nominate a member (for approval by the other Party), or fails to approve a member nominated by the other Party, of a DB of three persons by such date;
- c) The Parties fail to agree upon the appointment of the third member (to act as chairman) of the DB by such date; or
- d) The Parties fail to agree upon the appointment of a replacement person within 42 days after the date on which the sole member or one of the three members declines to act or is unable to act as a result of death, disability, resignation or termination of appointment;

then the appointing entity or official named in the Contract Data shall, upon the request of either or both of the Parties and after due consultation with both Parties, appoint this member of the DB. This appointment shall be final and conclusive. Each Party shall be responsible for paying one-half of the remuneration of the appointing entity or official.

20.4 Obtaining Dispute Board's Decision

If a dispute (of any kind whatsoever) arises between the Parties in connection with, or arising out of, the Contract or the execution of the Works, including any dispute as to any certificate, determination, instruction, opinion or valuation of the Engineer, either Party may refer the dispute in writing to the DB for its decision, with copies to the other Party and the Engineer. Such reference shall state that it is given under this Sub-Clause.

For a DB of three persons, the DB shall be deemed to have received such reference on the date when it is received by the chairman of the DB.

Both Parties shall promptly make available to the DB all such additional information, further access to the Site, and appropriate facilities, as the DB may require for the purposes of making a decision on such dispute. The DB shall be deemed to be not acting as arbitrator(s).

Within 84 days after receiving such reference, or within such other period as may be proposed by the DB and approved by both Parties, the DB shall give its decision, which shall be reasoned and shall state that it is given under this Sub-Clause. The decision shall be binding on both Parties, who shall promptly give effect to it unless and until it shall be revised in an amicable settlement or an arbitral award as described below. Unless the Contract has already been abandoned, repudiated or terminated, the Contractor shall continue to proceed with the Works in accordance with the Contract.

If either Party is dissatisfied with the DB's decision, then either Party may, within 28 days after receiving the decision, give a Notice of Dissatisfaction to the other Party indicating its dissatisfaction and intention to commence arbitration. If the DB fails to give its decision within the period of 84 days (or as otherwise approved) after receiving such reference, then either Party may, within 28 days after this period has expired, give a Notice of Dissatisfaction to the other Party.

In either event, this Notice of Dissatisfaction shall state that it is given under this Sub-Clause, and shall set out the matter in dispute and the reason(s) for dissatisfaction. Except as stated in Sub-Clause 20.7 *[Failure to Comply with Dispute Board's Decision]* and Sub-Clause 20.8 *[Expiry of Dispute Board's Appointment]*, neither Party shall be entitled to commence arbitration of a dispute unless a Notice of Dissatisfaction has been given in accordance with this Sub-Clause.

If the DB has given its decision as to a matter in dispute to both Parties, and no Notice of Dissatisfaction has been given by either Party within 28 days after it received the DB's decision, then the decision shall become final and binding upon both Parties.

20.5 Amicable Settlement

Where a Notice of Dissatisfaction has been given under Sub-Clause 20.4 above, both Parties shall attempt to settle the dispute amicably before the

commencement of arbitration. However, unless both Parties agree otherwise, the Party giving a Notice of Dissatisfaction in accordance with Sub-Clause 20.4 above should move to commence arbitration after the fifty-sixth day from the day on which a Notice of Dissatisfaction was given, even if no attempt at an amicable settlement has been made.

20.6 Arbitration

Any dispute between the Parties arising out of or in connection with the Contract not settled amicably in accordance with Sub-Clause 20.5 above and in respect of which the DB's decision (if any) has not become final and binding shall be finally settled by arbitration. Arbitration shall be conducted as follows:

- a) If the contract is with foreign contractors, International arbitration (1) with proceedings administered by the arbitration institution designated in the Contract Data, and conducted under the rules of arbitration of such institution; or, if so specified in the Contract Data, (2) international arbitration in accordance with the arbitration rules of the United Nations Commission on International Trade Law (UNCITRAL); or (3) if neither an arbitration institution nor UNCITRAL arbitration rules are specified in the Contract Data, with proceedings administered by the International Chamber of Commerce (ICC) and conducted under the ICC Rules of Arbitration; by one or more arbitrators appointed in accordance with said arbitration rules;
- b) If the Contract is with domestic contractors, arbitration with proceedings conducted in accordance with the laws of the Employer's country.

The place of arbitration shall be the neutral location specified in the Contract Data; and the arbitration shall be conducted in the language for communications defined in Sub-Clause 1.4 [*Law and Language*].

The arbitrators shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer, and any decision of the DB, relevant to the dispute. Nothing shall disqualify representatives of the Parties and the Engineer from being called as a witness and giving evidence before the arbitrators on any matter whatsoever relevant to the dispute.

Neither Party shall be limited in the proceedings before the arbitrators to the evidence or arguments previously put before the DB to obtain its decision, or to the reasons for dissatisfaction given in its Notice of Dissatisfaction. Any decision of the DB shall be admissible in evidence in the arbitration.

Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, the Engineer and the DB shall not be altered by reason of any arbitration being conducted during the progress of the Works.

20.7 Failure to Comply with Dispute Board's Decision

In the event that a Party fails to comply with a final and binding DB decision, then the other Party may, without prejudice to any other rights it may have, refer the failure itself to arbitration under Sub-Clause 20.6 [*Arbitration*]. Sub-Clause 20.4 [*Obtaining Dispute Board's Decision*] and Sub-Clause 20.5 [*Amicable Settlement*] shall not apply to this reference.

20.8 Expiry of Dispute Board's Appointment

If a dispute arises between the Parties in connection with, or arising out of, the Contract or the execution of the Works and there is no DB in place, whether by reason of the expiry of the DB's appointment or otherwise:

- a) Sub-Clause 20.4 [*Obtaining Dispute Board's Decision*] and Sub-Clause 20.5 [*Amicable Settlement*] shall not apply; and
- b) The dispute may be referred directly to arbitration under Sub-Clause 20.6 [*Arbitration*].

APPENDIX- A
General Conditions of Dispute Board Agreement

1. Definitions:

Each "Dispute Board Agreement" is a tripartite agreement by and between:

- a) The "Employer";
- b) The "Contractor"; and
- c) The "Member", who is defined in the Dispute Board Agreement as being:
 - (i) The sole member of the "DB" and, where this is the case, all references to the "Other Members" do not apply, or
 - (ii) One of the three persons who are jointly called the "DB" (or "Dispute Board") and, where this is the case, the other two persons are called the "Other Members".

The Employer and the Contractor have entered (or intend to enter) into a contract, which is called the "Contract" and is defined in the Dispute Board Agreement, which incorporates this Appendix. In the Dispute Board Agreement, words and expressions which are not otherwise defined shall have the meanings assigned to them in the Contract.

2. General Provisions:

Unless otherwise stated in the Dispute Board Agreement, it shall take effect on the latest of the following dates:

- a) The Commencement Date defined in the Contract;
- b) When the Employer, the Contractor and the Member have each signed the Dispute Board Agreement; or
- c) When the Employer, the Contractor and each of the Other Members (if any) have respectively each signed a dispute board agreement.

This employment of the Member is a personal appointment. At any time, the Member may give not less than 70 days' notice of resignation to the Employer and to the Contractor, and the Dispute Board Agreement shall terminate upon the expiry of this period.

3. Warranties:

The Member warrants and agrees that he/she is and shall be impartial and independent of the Employer, the Contractor and the Engineer. The Member shall promptly disclose, to each of them and to the Other Members (if any), any fact or circumstance which might appear inconsistent with his/her warranty and agreement of impartiality and independence.

When appointing the Member, the Employer and the Contractor relied upon the Member's representations that he/she is:

- a) Experienced in the work which the Contractor is to carry out under the Contract;
- b) Experienced in the interpretation of contract documentation; and
- c) Fluent in the language for communications defined in the Contract.

4. General Obligations of the Member:

The Member shall:

- a) Have no interest financial or otherwise in the Employer, the Contractor or Engineer, nor any financial interest in the Contract except for payment under the Dispute Board Agreement;
- b) Not previously have been employed as a consultant or otherwise by the Employer, the Contractor or the Engineer, except in such circumstances as were disclosed in writing to the Employer and the Contractor before they signed the Dispute Board Agreement;
- c) Have disclosed in writing to the Employer, the Contractor and the Other Members (if any), before entering into the Dispute Board Agreement and to his/her best knowledge and recollection, any professional or personal relationships with any director, officer or employee of the Employer, the Contractor or the Engineer, and any previous involvement in the overall project of which the Contract forms part;

- d) Not, for the duration of the Dispute Board Agreement, be employed as a consultant or otherwise by the Employer, the Contractor or the Engineer, except as may be agreed in writing by the Employer, the Contractor and the Other Members (if any);
- e) Comply with the annexed procedural rules and with Sub-Clause 20.4 of the Conditions of Contract;
- f) Not give advice to the Employer, the Contractor, the Employer's Personnel or the Contractor's Personnel concerning the conduct of the Contract, other than in accordance with the annexed procedural rules;
- g) Not while a Member enter into discussions or make any agreement with the Employer, the Contractor or the Engineer regarding employment by any of them, whether as a consultant or otherwise, after ceasing to act under the Dispute Board Agreement;
- h) Ensure his/her availability for all Site visits and hearings as are necessary;
- i) Become conversant with the Contract and with the progress of the Works (and of any other parts of the project of which the Contract forms part) by studying all documents received which shall be maintained in a current working file;
- j) Treat the details of the Contract and all the DB's activities and hearings as private and confidential, and not publish or disclose them without the prior written consent of the Employer, the Contractor and the Other Members (if any); and
- k) Be available to give advice and opinions, on any matter relevant to the Contract when requested by both the Employer and the Contractor, subject to the agreement of the Other Members (if any).

5. General Obligations of the Employer and the Contractor:

The Member regarding the Contract, otherwise than in the normal course of the DB's activities under the Contract and the Dispute Board Agreement. The Employer and the Contractor shall be responsible for compliance with this provision, by the Employer's Personnel and the Contractor's Personnel respectively.

The Employer and the Contractor undertake to each other and to the Member that the Member shall not, except as otherwise agreed in writing by the Employer, the Contractor, the Member and the Other Members (if any):

- a) Be appointed as an arbitrator in any arbitration under the Contract;
- b) Be called as a witness to give evidence concerning any dispute before arbitrator(s) appointed for any arbitration under the Contract; or
- c) Be liable for any claims for anything done or omitted in the discharge or purported discharge of the Member's functions, unless the act or omission is shown to have been in bad faith.

The Employer and the Contractor hereby jointly and severally indemnify and hold the Member harmless against and from claims from which he is relieved from liability under the preceding paragraph.

Whenever the Employer or the Contractor refers a dispute to the DB under Sub-Clause 20.4 of the Conditions of Contract, which will require the Member to make a Site visit and attend a hearing, the Employer or the Contractor shall provide appropriate security for a sum equivalent to the reasonable expenses to be incurred by the Member. No account shall be taken of any other payments due or paid to the Member.

6. Payment:

The Member shall be paid as follows, in the currency named in the Dispute Board Agreement:

- a) A retainer fee per calendar month, which shall be considered as payment in full for:
 - (i) Being available on 28 days' notice for all Site visits and hearings;
 - (ii) Becoming and remaining conversant with all project developments and maintaining relevant files;
 - (iii) All office and overhead expenses including secretarial services, photocopying and office supplies incurred in connection with his duties; and
 - (iv) All services performed hereunder except those referred to in sub-paragraphs (b) and (c) of this Clause.

The retainer fee shall be paid with effect from the last day of the calendar month in which the Dispute Board Agreement becomes effective; until the last day of the calendar month in which the Taking-Over Certificate is issued for the whole of the Works.

With effect from the first day of the calendar month following the month in which the Taking-Over Certificate is issued for the whole of the Works, the retainer fee shall be reduced by one third. This reduced fee shall be paid until the first day of the calendar month in which the Member resigns or the Dispute Board Agreement is otherwise terminated.

- b) A daily fee which shall be considered as payment in full for:
 - (i) Each day or part of a day up to a maximum of two days' travel time in each direction for the journey between the Member's home and the Site, or another location of a meeting with the Other Members (if any);
 - (ii) Each working day on Site visits, hearings or preparing decisions; and
 - (iii) Each day spent reading submissions in preparation for a hearing;
- c) All reasonable expenses including necessary travel expenses (air fare in less than first class, hotel and subsistence and other direct travel expenses) incurred in connection with the Member's duties, as well as the cost of telephone calls, courier charges, and faxes: a receipt shall be required for each item in excess of five percent of the daily fee referred to in sub-paragraph (b) of this Clause;
- d) Any taxes properly levied in the Country on payments made to the Member (unless a national or permanent resident of the Country) under this Clause 6.

The retainer and daily fees shall be as specified in the Dispute Board Agreement. Unless it specifies otherwise, these fees shall remain fixed for the first 24 calendar months, and shall thereafter be adjusted by agreement between the Employer, the Contractor and the Member, at each anniversary of the date on which the Dispute Board Agreement became effective.

If the parties fail to agree on the retainer fee or the daily fee, the appointing entity or official named in the Contract Data shall determine the amount of the fees to be used.

The Member shall submit invoices for payment of the monthly retainer and air fares quarterly in advance. Invoices for other expenses and for daily fees shall be submitted following the conclusion of a Site visit or hearing. All invoices shall be accompanied by a brief description of activities performed during the relevant period and shall be addressed to the Contractor.

The Contractor shall pay each of the Member's invoices in full within 56 calendar days after receiving each invoice and shall apply to the Employer (in the Statements under the Contract) for reimbursement of one-half of the amounts of these invoices. The Employer shall then pay the Contractor in accordance with the Contract.

If the Contractor fails to pay to the Member the amount to which he/she is entitled under the Dispute Board Agreement, the Employer shall pay the amount due to the Member and any other amount which may be required to maintain the operation of the DB; and without prejudice to the Employer's rights or remedies. In addition to all other rights arising from this default, the Employer shall be entitled to reimbursement of all sums paid in excess of one-half of these payments, plus all costs of recovering these sums and financing charges calculated at the rate specified in Sub-Clause 14.8 of the Conditions of Contract.

If the Member does not receive payment of the amount due within 70 days after submitting a valid invoice, the Member may (i) suspend his/her services (without notice) until the payment is received, and/or (ii) resign his/her appointment by giving notice under Clause 7.

7. Termination:

At any time: (i) the Employer and the Contractor may jointly terminate the Dispute Board Agreement by giving 42 days' notice to the Member; or (ii) the Member may resign as provided for in Clause 2.

If the Member fails to comply with the Dispute Board Agreement, the Employer and the Contractor may, without prejudice to their other rights, terminate it by notice to the Member. The notice shall take effect when received by the Member.

If the Employer or the Contractor fails to comply with the Dispute Board Agreement, the Member may, without prejudice to his other rights, terminate it by notice to the Employer and the Contractor. The notice shall take effect when received by them both.

Any such notice, resignation and termination shall be final and binding on the Employer, the Contractor and the Member. However, a notice by the Employer or the Contractor, but not by both, shall be of no effect.

8. Default of the Member:

If the Member fails to comply with any of his obligations under Clause 4 (a) - (d) above, he shall not be entitled to any fees or expenses hereunder and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses received by the Member and the Other Members (if any), for proceedings or decisions (if any) of the DB which are rendered void or ineffective by the said failure to comply.

If the Member fails to comply with any of his obligations under Clause 4 (e) - (k) above, he shall not be entitled to any fees or expenses hereunder from the date and to the extent of the non-compliance and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses already received by the Member, for proceedings or decisions (if any) of the DB which are rendered void or ineffective by the said failure to comply.

9. Disputes:

Any dispute or claim arising out of or in connection with this Dispute Board Agreement, or the breach, termination or invalidity thereof shall be finally settled by institutional arbitration. If no other arbitration institute is agreed, the arbitration shall be conducted under the Rules of Arbitration of the International Chamber of Commerce by one arbitrator appointed in accordance with these Rules of Arbitration.

PROCEDURAL RULES

1. Unless otherwise agreed by the Employer and the Contractor, the DB shall visit the Site at intervals of not more than 140 days, including times of critical construction events, at the request of either the Employer or the Contractor. Unless otherwise agreed by the Employer, the Contractor and the DB, the period between consecutive visits shall not be less than 70 days, except as required to convene a hearing as described below.
2. The timing of and agenda for each Site visit shall be as agreed jointly by the DB, the Employer and the Contractor, or in the absence of agreement, shall be decided by the DB. The purpose of Site visits is to enable the DB to become and remain acquainted with the progress of the Works and of any actual or potential problems or claims, and, as far as reasonable, to endeavour to prevent potential problems or claims from becoming disputes.
3. Site visits shall be attended by the Employer, the Contractor and the Engineer and shall be coordinated by the Employer in co-operation with the Contractor. The Employer shall ensure the provision of appropriate conference facilities and secretarial and copying services. At the conclusion of each Site visit and before leaving the site, the DB shall prepare a report on its activities during the visit and shall send copies to the Employer and the Contractor.
4. The Employer and the Contractor shall furnish to the DB one copy of all documents which the DB may request, including Contract documents, progress reports, variation instructions, certificates and other documents pertinent to the performance of the Contract. All communications between the DB and the Employer or the Contractor shall be copied to the other Party. If the DB comprises three persons, the Employer and the Contractor shall send copies of these requested documents and these communications to each of these persons.
5. If any dispute is referred to the DB in accordance with Sub-Clause 20.4 of the Conditions of Contract, the DB shall proceed in accordance with Sub-Clause 20.4 and these Rules. Subject to the time allowed to give notice of a decision and other relevant factors, the DB shall:
 - a) Act fairly and impartially as between the Employer and the Contractor, giving each of them a reasonable opportunity of putting his case and responding to the other's case; and
 - b) Adopt procedures suitable to the dispute, avoiding unnecessary delay or expense.
6. The DB may conduct a hearing on the dispute, in which event it will decide on the date and place for the hearing and may request that written documentation and arguments from the Employer and the Contractor be presented to it prior to or at the hearing.
7. Except as otherwise agreed in writing by the Employer and the Contractor, the DB shall have power to adopt an inquisitorial procedure, to refuse admission to hearings or audience at hearings to any persons other than representatives of the Employer, the Contractor and the Engineer, and to proceed in the absence of any party who the DB is satisfied received notice of the hearing; but shall have discretion to decide whether and to what extent this power may be exercised.
8. The Employer and the Contractor empower the DB, among other things, to:
 - a) Establish the procedure to be applied in deciding a dispute;
 - b) Decide upon the DB's own jurisdiction, and as to the scope of any dispute referred to it;
 - c) Conduct any hearing as it thinks fit, not being bound by any rules or procedures other than those contained in the Contract and these Rules;
 - d) Take the initiative in ascertaining the facts and matters required for a decision;
 - e) Make use of its own specialist knowledge, if any;
 - f) Decide upon the payment of financing charges in accordance with the Contract;
 - g) Decide upon any provisional relief such as interim or conservatory measures; and
 - h) Open up, review and revise any certificate, decision, determination, instruction, opinion or valuation of the Engineer, relevant to the dispute.
9. The DB shall not express any opinions during any hearing concerning the merits of any arguments advanced by the Parties. Thereafter, the DB shall make and give its decision in accordance with Sub-Clause 20.4, or as otherwise agreed by the Employer and the Contractor in writing. If the DB comprises three persons:
 - a) It shall convene in private after a hearing, in order to have discussions and prepare its decision;

- b) It shall endeavour to reach a unanimous decision: if this proves impossible the applicable decision shall be made by a majority of the Members, who may require the minority Member to prepare a written report for submission to the Employer and the Contractor; and
- c) If a Member fails to attend a meeting or hearing, or to fulfil any required function, the other two Members may nevertheless proceed to make a decision; unless:
 - (i) Either the Employer or the Contractor does not agree that they do so; or
 - (ii) The absent Member is the chairman and he/she instructs the other Members not to make a decision.

APPENDIX- B

Corrupt and Fraudulent Practices – Environmental and Social Responsibility

1. Corrupt and Fraudulent Practices

The Contracting Authority and the suppliers, contractors, subcontractors, consultants or subconsultants must observe the highest standard of ethics during the procurement process and performance of the contract. The Contracting Authority means the Purchaser, the Employer, the Client, as the case may be, for the procurement of goods, works, plants, consulting services or non-consulting services.

By signing the Statement of Integrity the suppliers, contractors, subcontractors, consultants or subconsultants declare that (i) “it did not engage in any practice likely to influence the contract award process to the Contracting Authority’s detriment, and that it did not and will not get involved in any anti-competitive practice”, and that (ii) “the procurement process and the performance of the contract did not and shall not give rise to any act of corruption or fraud”.

Moreover, AFD requires including in the Procurement Documents and AFD-financed contracts a provision requiring that suppliers, contractors, subcontractors, consultants or subconsultants will permit AFD to inspect their accounts and records relating to the procurement process and performance of the AFD-financed contract, and to have them audited by auditors appointed by AFD.

AFD reserves the right to take any action it deems appropriate to check that these ethics rules are observed and reserves, in particular, the rights to:

- a) Reject a proposal for a contract award if it is established that during the selection process the bidder or consultant that is recommended for the award has been convicted of corruption, directly or by means of an agent, or has engaged in fraud or anti-competitive practices in view of being awarded the Contract;
- b) Declare misprocurement when it is established that, at any time, the Contracting Authority, the suppliers, contractors, subcontractors, consultants or subconsultants their representatives have engaged in acts of corruption, fraud or anti-competitive practices during the procurement process or performance of the contract without the Contracting Authority having taken appropriate action in due time satisfactory to AFD to remedy the situation, including by failing to inform AFD at the time they knew of such practices.

AFD defines, for the purposes of this provision, the terms set forth below as follows:

- a) Corruption of a Public Officer means:
 - The act of promising, offering or giving to a Public Officer, directly or indirectly, an undue advantage of any kind for himself or for another Person¹ or entity, for such Public Officer to act or refrain from acting in his official capacity; or
 - The act by which a Public Officer solicits or accepts, directly or indirectly, an undue advantage of any kind for himself or for another Person or entity, for such Public Officer to act or refrain from acting in his official capacity.
- b) A Public Officer shall be construed as meaning:
 - Any person who holds a legislative, executive, administrative or judicial mandate (within the country of the Contracting Authority) regardless of whether that natural Person was nominated or elected, regardless of the permanent or temporary, paid or unpaid nature of the position and regardless of the hierarchical level the natural Person occupies;
 - Any other natural Person who performs a public function, including for a State institution or a State-owned company, or who provides a public service;
 - Any other natural Person defined as a Public Officer by the national laws of the country of the Contracting Authority.
- c) Corruption of a Private Person² means:
 - The act of promising, offering or giving to any Private Person, directly or indirectly, an undue advantage of any kind for himself or for another Person or entity, for such Private Person to perform or refrain from performing any act in breach of its legal, contractual or professional obligations; or;

¹ Means any Person whether natural or legal, firm, company, corporation, government, state or state agency or any association, or group of two or more of the foregoing (whether or not having separate legal status).

² Means any natural Person other than a Public Officer.

- The act by which any Private Person solicits or accepts, directly or indirectly, an undue advantage of any kind for himself or for another Person or entity, for such Private Person to perform or refrain from performing any act in breach of its legal, contractual or professional obligations.
- d) Fraud means any dishonest conduct (act or omission), whether or not it constitutes a criminal offence, deliberately intended to deceive others, to intentionally conceal items, to violate or vitiate consent, to circumvent legal or regulatory requirements and/or to violate internal rules in order to obtain illegitimate profit.
- e) Anti-competitive practices mean:
 - Any concerted or implied practices which have as their object or effect the prevention, restriction or distortion of competition within a marketplace, especially where they (i) limit access to the marketplace or free exercise of competition by other undertakings, (ii) prevent free, competition-driven price determination by artificially causing price increases or decreases, (iii) restrict or control production, markets, investments or technical progress; or (iv) divide up market shares or sources of supply;
 - Any abuse by one undertaking or a group of undertakings which hold a dominant position on an internal market or on a substantial part of it;
 - Any practice whereby prices are quoted or set unreasonably low, the object of which is to eliminate an undertaking or any of its products from a market or to prevent it from entering the market.

2. Environmental and Social Responsibility

In order to promote sustainable development, AFD seeks to ensure that internationally recognized environmental and social standards are complied with. Suppliers, contractors, subcontractors, consultants or subconsultants for AFD-financed contracts shall consequently undertake in the Statement of Integrity to:

- a) Comply with and ensure that all their subcontractors or subconsultants comply with international environmental and labour standards, consistent with applicable law and regulations in the country of implementation of the contract, including the fundamental conventions of the International Labour Organization (ILO) and international environmental treaties;
- b) Implement environmental and social risks mitigation measures when specified in the environmental and social management plan (ESMP) provided by the Contracting Authority.

APPENDIX- C
Eligibility Criteria

Eligibility in AFD-Financed Procurement

1. Financing allocated by AFD to a Contracting Authority has been entirely untied since 1st January 2002. To the exception of any equipment or any sector which is subject to an embargo by the United Nations, the European Union or France, all goods, works, plants, consulting services and non-consulting services are eligible for AFD financing regardless of the country of origin of the supplier, contractor, subcontractor, consultant or subconsultant inputs or resources used in the implementation processes. The Contracting Authority means the Purchaser, the Employer, the Client, as the case may be, for the procurement of goods, works, plants, consulting services or non-consulting services.
2. Natural or legal Persons¹ (including all members of a joint venture or any of their suppliers, contractors, subcontractors, consultants or subconsultants) shall not be awarded an AFD-financed contract if, on the date of submission of an application, a bid or a proposal, or on the date of award of a contract, they:
 - 2.1 Are bankrupt or being wound up or ceasing their activities, are having their activities administered by the courts, have entered into receivership, or are in any analogous situation arising from a similar procedure;
 - 2.2 Have been:
 - a) convicted, within the past five years by a court decision, which has the force of res judicata in the country where the contract is implemented, of fraud, corruption or of any other offense committed during a procurement process or performance of a contract, unless they provide supporting information together with their Statement of Integrity (Form available as Appendix to the Application, Bid or Proposal Submission Form) which shows that this conviction is not relevant in the context of the Contract;
 - b) subject to an administrative sanction within the past five years by the European Union or by the competent authorities of the country where they are constituted, for fraud, corruption or for any other offense committed during a procurement process or performance of a contract, unless they provide supporting information together with their Statement of Integrity (Form available as Appendix to the Application, Bid or Proposal Submission Form) which shows that this sanction is not relevant in the context of the Contract;
 - c) convicted, within the past five years by a court decision, which has the force of res judicata, of fraud, corruption or of any other offense committed during the procurement process or performance of an AFD-financed contract;
 - 2.3 Are listed for financial sanctions by the United Nations, the European Union and/or France for the purposes of fight-against-terrorist financing or threat to international peace and security;
 - 2.4 Have been subject within the past five years to a contract termination fully settled against them for significant or persistent failure to comply with their contractual obligations during contract performance, unless this termination was challenged and dispute resolution is still pending or has not confirmed a full settlement against them;
 - 2.5 Have not fulfilled their fiscal obligations regarding payments of taxes in accordance with the legal provisions of either the country where they are constituted or the Contracting Authority's country;
 - 2.6 Are subject to an exclusion decision of the World Bank and are listed on the website <http://www.worldbank.org/debarr>, unless they provide supporting information together with their Statement of Integrity (Form available as Appendix to the Application, Bid or Proposal Submission Form) which shows that this exclusion is not relevant in the context of the Contract;
 - 2.7 Have created false documents or committed misrepresentation in documentation requested by the Contracting Authority as part of the procurement process of the Contract.
3. State-owned entities may compete only if they can establish that they (i) are legally and financially autonomous, and (ii) operate under commercial law. To be eligible, a state-owned entity shall establish to AFD's satisfaction, through all relevant documents, including its Charter and other information AFD may request, that it: (i) is a legal entity separate from their state (ii) does not currently receive substantial subsidies or budget support; (iii) operates like any commercial enterprise, and, inter alia, is not obliged to pass on its surplus to their state, can acquire rights and liabilities, borrow funds and be liable for repayment of its debts, and can be declared bankrupt.

¹ Means any Person whether natural or legal, firm, company, corporation, government, state or state agency or any association, or group of two or more of the foregoing (whether or not having separate legal status).

Section IX - Particular Conditions (PC)

The following Particular Conditions shall supplement the GC. Whenever there is a conflict, the provisions herein shall prevail over those in the GC.

Part A - Contract Data

Conditions	Sub-Clause	Data
Employer's name and address	1.1.2.2 & 1.3	Project Director, PMU, Assam Project on Forest and Biodiversity Conservation Society (APFBCS), Aranya Bhawan, Panjabari, Guwahati - 781037 (Assam)
Engineer's name and address	1.1.2.4 & 1.3	<i>Project Engineer, PMU, APFBCS</i>
Bank's Name	1.1.2.11	<i>Agence Française de Développement ("AFD"), being specified that, according to French laws and regulations, AFD is not a bank but a Specialized Financial Institution ("Institution Financière Spécialisée").</i>
Borrower's Name	1.1.2.12	The "Borrower" is the Employer
Time for Completion of the Works	1.1.3.3	730 days
Defects Notification Period	1.1.3.7	365 days
Sections	1.1.5.6	Not applicable
ESHS Specifications	1.1.6.11	ESHS Specifications are applicable: Yes <input checked="" type="checkbox"/> / No <input type="checkbox"/>
Exceptionally Adverse Climatic Conditions	1.1.6.15	<i>Additional Sub-Clause</i> "Exceptionally Adverse Climatic Conditions" means: <ul style="list-style-type: none"> - Rainfall: Greater than 150 mm/day (any day); - Wind speed: Greater than 20 knots (any day) - Temperature: Greater than 35°C or, less than 10°C (day's temperature); - Flooding of the work site (number of days inundated).
Governing Law	1.4	The Laws of India
Ruling Language	1.4	English
Language for Communications	1.4	English
Time for Access to the Site	2.1	14 (fourteen) days after Commencement Date.
Engineer's Duties and Authority	3.1	The Engineer shall obtain specific approval of the Employer before taking the following actions: <input checked="" type="checkbox"/> Issuing any instruction resulting in substantial changes to the Works, or an increase of the Accepted Contract Amount and/or an extension of the Time for Completion; <input checked="" type="checkbox"/> Proceeding to Determination under Sub-Clause 3.5 <input checked="" type="checkbox"/> Issuing Interim Payment Certificate under Sub-Clause 14.6; <input checked="" type="checkbox"/> Issuance of a Taking over Certificate under Sub-Clauses 10.1 and 10.2;
Contractor's General Obligations	4.1	The Contractor shall provide the following documents as part of the Contract and as specified in the Specification: <input checked="" type="checkbox"/> Shop drawings to be approved by the Engineer prior to starting the Works; <input checked="" type="checkbox"/> "As-built" drawings to be approved by the Engineer prior to taking over of the Works; and <input type="checkbox"/> Operation and maintenance manuals.
Performance Security	4.2	The performance security will be in the form of a demand guarantee in the amount(s) of 10 (Ten) percent of the

Conditions	Sub-Clause	Data
		Accepted Contract Amount and in the same currency(ies) of the Accepted Contract Amount.
Subcontractors	4.4	Direct payment of Subcontractors is allowed: No
Progress Reports	4.21	Frequency of progress reports: Monthly
Engagement of Staff and Labour	6.1	Local Staff and Labour should be deployed. Out of which 30% should be female.
Normal Working Hours	6.5	8 (Eight) Hours from 9:00 AM to 5:00 PM from Monday to Saturday
Commencement of Works	8.1	The Commencement Date shall be the later of the following: a) 15 th day from the date of signature of the Contract Agreement (subject to the Contractor furnishing a Performance Security) or b) date of intimation, to the Contractor, of the financial arrangements by the Employer
Delay Damages for the Works	8.7 & 14.15(b)	0.5% (zero point five percent) per week or part thereof
Maximum Amount of Delay Damages	8.7	10% (ten percent) of the final Contract Price (excluding the Plantation Maintenance components)
Percentage for Adjustment of Provisional Sums	13.5(b)(ii)	Not Applicable
Adjustments for Changes in Cost	13.8	Not Applicable
Contract Price	14.1	The Contract Price is an Admeasurement Contract Price (unit price contract) The Admeasurement Component consists of: Items of works included in the Bill of Quantities (BoQ) of the Price Schedule
	14.1(b)	The following taxes, duties and fees exemptions apply to the Contract: None
	14.1(e)	Item (e) of Sub-Clause 14.1 - Part B of the PC regarding the exemption of import duties and taxes is applicable: No
Total Advance Payment	14.2	Upto 10% (ten percent) of the Accepted Contract Amount payable in the currencies and proportions in which the Accepted Contract Amount is payable.
Repayment Amortization Rate of Advance Payment	14.2(b)	The repayment amortization rate (%) shall be twice the percentage specified as Advance Payment in GC 14.2.
Percentage of Retention	14.3	5% (Five percent) from every Running Account Bill.
Limit of Retention Money	14.3	5% (Five percent) of the Accepted Contract Amount
Plant and Materials	14.5(b)(i)	Not Applicable Plant and Materials for payment when shipped en route to the Site (Free on Board): Not Applicable
	14.5(c)(i)	Plant and Materials for payment when delivered to the Site: Not Applicable
Minimum Amount of Interim Payment Certificates	14.6	INR 7.00 Million on monthly progress of at least 5% of Contract value.
Payment	14.7	The Employer shall pay to the Contractor the amount certified in each Interim Payment Certificate within 56 days. Payment to the Contractor of the amounts due in each currency shall be made into the following bank accounts: <i>[Insert bank account details at the time of contract signing]</i>

Conditions	Sub- Clause	Data
Publishing source of commercial interest rates for financial charges in case of delayed payment	14.8	The interest rate for payments in local currency is as per GC 14.8.
Limitation of Liability	17.6	The total liability of the Contractor to the Employer shall not exceed the Accepted Contract Amount multiplied by ONE.
Periods for submission of insurance: a) Evidence of insurance b) Relevant policies	18.1	21 (twenty one) days 28 (twenty eight) days
Minimum amount of third-party insurance per occurrence	18.3	1% (one percent) of the Accepted Contract Amount with no limit on the number of occurrences
Date by which the DB shall be appointed	20.2	28 days after the Commencement Date.
The DB shall be comprised of:	20.2	Adjudicator
List of potential DB sole members	20.2	To be framed before signing of Contract
Appointment (if not agreed) to be made by:	20.3	Institution of Engineers (India), Assam State Centre.
Arbitration rules	20.6	Indian Arbitration and Conciliation Act - 1996 with latest amendments as on the date of signing the Contract
Place of arbitration	20.6	Guwahati

Table: Summary of Sections

Section Name/Description (Sub-Clause 1.1.5.6)	Time for Completion (Sub-Clause 1.1.3.3)	Damages for Delay (Sub-Clause 8.7)
NOT APPLICABLE TO THIS BID		

Part B – Specific Provisions

Conditions	Sub-Clause	Specific provisions
Schedules	1.1.1.7	<i>If the option full Lump Sum has been selected in Sub-Clause 14.1 of these Particular Conditions, then: Delete "the Bill of Quantities" in the third line.</i>
Bill of Quantities and "Daywork Schedule"	1.1.1.9	<i>If the option a mix of Lump Sum Price Component and Admeasurement Component has been selected in Sub-Clause 14.1 of these Particular Conditions, this Sub-Clause is deleted in its entirety and replaced by: "Bill of Quantities" means the document so named related to the Admeasurement Component of the Works which is comprised in the Schedules. "Daywork Schedule" means the document so named (if any) which is comprised in the Schedules. <i>If the option full Lump Sum has been selected in Sub-Clause 14.1 of these Particular Conditions, this Sub-Clause is deleted in its entirety and replaced by: <u>1.1.1.9 Daywork Schedule</u> "Daywork Schedule" means the document so named (if any) which is comprised in the Schedules.</i></i>
Defects Notification Period	1.1.3.7	<i>Add, at the end of the Sub-Clause "or taken over under Sub-Clause 10.2 [Taking Over of Parts of the Works]"</i>
Lump Sum Price Component	1.1.4.13	<i>If the option a mix of Lump Sum Price Component and Admeasurement Component has been selected in Sub-Clause 14.1 of these Particular Conditions, then: "Lump Sum Price Component" means the parts of the Works in respect of which the Contract Price shall not be subject to re-measurement in accordance with Clause 12 [Measurement and Evaluation].</i>
Admeasurement Component	1.1.4.14	<i>If the option a mix of Lump Sum Price Component and Admeasurement Component has been selected in Sub-Clause 14.1 of these Particular Conditions, then: "Admeasurement Component" means the parts of the Works in respect of which the Contract Price shall be subject to re-measurement in accordance with Clause 12 [Measurement and Evaluation].</i>
Site	1.1.6.7	<i>This Sub-Clause is deleted in its entirety and replaced by: "Site" means the places where the Permanent Works are to be executed and to which Plant and Materials are to be delivered, and any other places as may be specified in the Contract as forming part of the Site.</i>
Variation	1.1.6.9	<i>This Sub-Clause is deleted in its entirety and replaced by: "Variation" means any change to Specification or the Drawings or the Works, which is instructed or approved as a variation under Clause 13 [Variations and Adjustments].</i>
ESHS Specifications	1.1.6.11	<i>Additional Sub-Clause: "ESHS Specifications" means the document entitled environmental, social, health and safety specifications, as included in the Specification, and any additions and modifications to it in accordance with the Contract. Such document specifies the environmental, social, health and safety obligations of the Contractor.</i>
Project Area	1.1.6.12	<i>Additional Sub-Clause: "Project Area" has the meaning defined in the ESHS Specifications.</i>

Conditions	Sub-Clause	Specific provisions
Worksite - ESMP	1.1.6.13	<p><i>Additional Sub-Clause:</i></p> <p>"Worksite - ESMP" stands for Worksite Environmental and Social Management Plan, and has the meaning defined in the ESHS Specifications.</p>
EPP	1.1.6.14	<p><i>Additional Sub-Clause:</i></p> <p>"EPP" stands for Environmental Protection Plan, and has the meaning defined in the ESHS Specifications.</p>
Communications	1.3	<p><i>Add the following at the end of item (a), after "Contract Data" and before ";":</i></p> <p>"In case of electronic transmission, these communications shall be in the form of an un-editable record attached to an electronic mail, such as a PDF document for instance, and any other communication transmitted in a different manner, such as the email body text, shall not be construed as communication under the Contract."</p> <p><i>Before the last paragraph, add the following sentence:</i></p> <p>"Delivery of communications, by any authorized method of transmission, shall be made against receipt."</p>
Priority of Documents	1.5	<p><i>Add the following at the end of the Sub-Clause:</i></p> <p>"The Contractor shall be obliged to comply with the clarification or instruction of the Engineer without any adjustment to the Contract Price and/or to the Time for Completion."</p>
Contract Agreement	1.6	<p><i>This Sub-Clause is deleted in its entirety and replaced by:</i></p> <p>"The Parties shall enter into a Contract Agreement within 28 days after the Contractor receives the Letter of Acceptance, or within 28 days after the Employer receives the Performance Security, whichever is later. The Contract Agreement shall be based upon the form annexed to the Particular Conditions. The Contract Agreement shall include any annexed memoranda comprising agreements between and signed by both Parties. 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 Contractor.</p> <p>This Contract constitutes the entire agreement between the Parties in connection with its subject matter and supersedes all prior representations, communications, negotiations and undertakings concerning the subject matter of this Contract.</p> <p>The Parties acknowledge and agree that by entering into this Contract they do not rely on any statement, representation, assurance or warranty of any person (whether a party to the Contract or not or whether made in writing or not) other than as expressly set out in the Contract."</p>
Assignment	1.7	<p><i>This Sub-Clause is deleted in its entirety and replaced by:</i></p> <p>"The Contractor shall not assign the whole or any part of the Contract or any benefit or interest in or under the Contract without the prior written consent of the Employer. The Employer shall be entitled to assign this Contract or any part of it to any person, for which purpose it shall not require the consent of the Contractor."</p>
Care and Supply of Document	1.8	<p><i>Delete the 2nd sentence of the 2nd paragraph in its entirety, and replace it by:</i></p> <p>"The Contractor shall supply to the Engineer each of the Contractor's Documents in one (1) soft (paper) copy and two (2) hard (digital) copies "</p>

Conditions	Sub- Clause	Specific provisions
Inspections and Audit by AFD	1.15	<p><i>This Sub-Clause is deleted in its entirety and replaced by:</i></p> <p>"The Contractor shall permit, and shall cause its agents (whether declared or not), subcontractors, subconsultants, service providers, or suppliers and any personnel thereof, to permit, AFD and/or persons appointed by AFD to inspect the Site and all accounts and records relating to the performance of the Contract and the submission of the Bid, and to have such accounts and records audited by auditors appointed by AFD if requested by AFD.</p> <p>The Contractor's attention is drawn to Sub-Clause 15.6 <i>[Corrupt or Fraudulent Practices]</i> which provides, inter alia, that acts intended to materially impede the exercise of AFD's inspection and audit rights provided for under Sub-Clause 1.15 constitute a prohibited practice subject to contract termination."</p>
Non Waiver	1.16	<p><i>Additional Sub-Clause:</i></p> <p>"Except as otherwise specifically provided for in the Contract, no failure or delay by either Party in exercising any right or remedy provided by the Laws or pursuant to the Contract will impair such right or remedy or operate or be construed as a waiver or variation of it or preclude its exercise at any subsequent time and no single or partial exercise of any such right or remedy will preclude any other or further exercise of it or the exercise of any other right or remedy."</p>
Survival of Obligations	1.17	<p><i>Additional Sub-Clause:</i></p> <p>"Obligations under the Contract, which by their nature would continue beyond the termination or expiration hereof, including, by way of illustration only and not limitation, those in Clause 1 <i>[General Provisions]</i>, Clause 11 <i>[Defects Liability]</i>, Clause 17 <i>[Indemnities]</i>, Clause 18 <i>[Insurance]</i>, and Clause 20 <i>[Claims and Disputes]</i> shall survive the termination or expiration of the Contract."</p>
Severability	1.18	<p><i>Additional Sub-Clause:</i></p> <p>"The Parties expressly declare that each section, clause or paragraph of this Contract will be considered separate in terms of its validity and enforceability. Therefore, if, for any reason, any provision of this Contract is declared null and void, or if a ruling states that any part of it runs contrary to governing law, said declaration will in no way affect the validity and enforceability of the other stipulations, which may be construed, understood and executed independently of the portion declared null and void. Thus, every part of this Contract not declared null and void in any way will be valid, enforceable and binding on the Parties.</p> <p>Likewise, if any provision of this Contract or its application to any individual or company or in a given circumstance is declared null and void, or if its enforceability is in any way limited, the other provisions herein, as well as also the application of the doubtful provision to other people or in other circumstances, will not be affected thereby, and they will be applied to the extent permitted by governing law.</p> <p>Notwithstanding the above, the Parties undertake to negotiate in good faith the terms of a mutually satisfactory provision to replace any clause that may be declared null and void or whose enforceability is in any way restricted."</p>
No Partnership or Agency	1.19	<p><i>Additional Sub-Clause:</i></p> <p>"Nothing contained in this Contract shall be construed to either constitute a partnership or constitute either Party an agent or</p>

Conditions	Sub- Clause	Specific provisions
		employee of the other Party."
Amendment	1.20	<p><i>Additional Sub-Clause:</i></p> <p>"This Contract may not be altered, varied, changed, supplemented or amended except by a written instrument duly signed and executed by the Parties and expressly stated to be an amendment to this Contract. For the sake of clarity, any Variation under Clause 13 [<i>Variations and Adjustments</i>] which is leading to a substantial change to the Works, an increase of the Contract Price and/or to an extension of the Time for Completion shall be reflected in an amendment to this Contract."</p>
Right of Access to the Site	2.1	<p><i>Insert the following in the 1st paragraph, after the 1st sentence and before the 2nd sentence:</i></p> <p>"This Employer is however under no obligation to give the Contractor right of access to, and possession of, any other area located outside the boundaries of the Site, even if such other area is located within the Project Area. Access to, and possession of, such any other area is fully at the Contractor's risk."</p> <p><i>Add at the end of the 1st paragraph, after "received", the following:</i></p> <p>"and until such time, whichever is the later, the Contractor has provided written evidence in the form of a broker's or an insurer's certificate that all insurances to be taken-out by the Contractor pursuant to the Contract have been duly put in place and are in full force and effect."</p>
Employer's Claims	2.5	<i>Delete the 2nd sentence of the 2nd paragraph in its entirety.</i>
Delegation by the Engineer	3.2	Delegation by the Engineer is subject to the provisions of the contract between the Employer and the Engineer.
Instructions of the Engineer	3.3	<p><i>Remove the entire text from "If the Engineer or a delegated assistant" to "(as the case may be)", and replace it by the following:</i></p> <p>"Verbal instructions given on Site shall only be binding on the Contractor if recorded by the Engineer or his delegated assistant (as the case may be) in the on-site log book defined under Sub-Clause 4.25."</p> <p><i>Add the following at the end of the Sub-Clause:</i></p> <p>"If such an instruction would in the opinion of the Contractor, acting reasonably:</p> <ul style="list-style-type: none"> (i) Result in possible adverse consequences for, including but not limited to, the quality of the Works and/or the Time for Completion; and/or (ii) Otherwise result in any increase in the Contract Price then: <p>the Contractor shall immediately notify the Employer and the Engineer of the same in writing, and in any event before the Contractor implements the instruction. Following the issue of such notice, the Contractor shall implement the instruction given by the Engineer unless instructed otherwise by the Engineer.</p> <p>Under any circumstances, failure by the Contractor to notify the Engineer in accordance with Sub-Clause 20.1 [<i>Contractor's Claims</i>] shall mean that any performance of the Works relating thereto shall be deemed to be solely at the Contractor's risk and cost. The Contractor shall not have the right thereafter to rely on such circumstances when a claim is made against him by the Employer for any failure by the Contractor to perform</p>

Conditions	Sub- Clause	Specific provisions
		the Works in accordance with the requirements of the Contract or by him to the Employer for any relief (which includes, without limitation, any claim for any extension to the Time for Completion and/or for any additional payment) in accordance with the Contract."
Replacement of the Engineer	3.4	<i>Not applicable.</i>
Contractor's General Obligations	4.1	<p><i>Insert the following at the end of the 2nd paragraph:</i></p> <p>"The Contractor commits to meet the AFD's eligibility criteria as listed under Appendix C to the General Conditions."</p> <p><i>Insert the following at the end of the Sub-Clause:</i></p> <p>"If an unsolicited technical alternative, proposed by the Contractor, and approved by the Employer, becomes incorporated under the Contract and includes a change in the design of part or all of the Works, then unless otherwise agreed by both Parties: (i) the Bidder who becomes the Contractor shall design this part, (ii) sub-paragraphs (a) to (d) of the Conditions of Contract Sub-Clause 4.1 shall apply, and (iii) Contract price for this part of the Works shall be a lump sum price."</p>
Contractor's Representative	4.3	<p><i>Delete the 3rd paragraph in its entirety and replace it by the following:</i></p> <p>"The Contractor shall not, without the prior consent of the Employer, revoke the appointment of the Contractor's Representative or appoint a replacement."</p>
Subcontractors	4.4	<p><i>Insert the following at the beginning of the Sub-Clause:</i></p> <p>"The Contractor shall only employ Subcontractors meeting the AFD's eligibility criteria as listed under Appendix C to the General Conditions.</p> <p>In case of failure by the Contractor to comply with this requirement, and irrespective of whether the Employer's Representative has given prior consent under this Sub-Clause, the Contractor shall forthwith cease any business dealing with any ineligible Subcontractor and replace such Subcontractor by an eligible one, all at the Contractor's risk and cost. Otherwise, the Employer, at his own election, shall be entitled to terminate the Contract in accordance with Sub-Clause 15.2 [Termination by Employer]."</p> <p><i>In item (b), replace "Engineer" by "Employer".</i></p> <p><i>If the option for direct payment of Subcontractors has been selected in Sub-Clause 4.4 of the PC, then:</i></p> <p>A Subcontractor named in the Contract or designated after Contract signing with the Engineer's consent may be paid directly by the Employer for work done, and/or supplies or services provided by the said Subcontractor for which the Contractor has not been already paid, if (a) the Employer and the relevant authorities whose approval of the Contract is required so agree, or (b) the Employer's country laws and regulations so require.</p> <p>In such case, the Contractor shall furnish a statement to the Engineer, prior to any commencement of the subcontracted work including the following:</p> <ol style="list-style-type: none"> a) The nature and scope of work or activities intended to be subcontracted; b) The name, registration information and address of the proposed Subcontractor; and c) The payment terms and conditions intended in the

Conditions	Sub-Clause	Specific provisions
		<p>subcontract agreement, and the intended amount of the subcontract, including the date of establishment of the price, and if applicable, the modalities for price variation, advance payment, progress payment mechanism, price reductions, bonuses and penalties.</p> <p>Within one (1) month of their receipt the Engineer shall either accept all supporting documents relating to direct payment or reject them in full or in part with justification to the Contractor, failing which the Engineer shall be deemed to have accepted all supporting documents which the Engineer did not explicitly rejected.</p>
Safety Procedures	4.8	<p><i>Add the following at the end of the Sub-Clause:</i></p> <p>"These provisions are complemented by those listed under the ESHS Specifications which the Contractor must ensure full compliance with."</p>
Protection of the Environment	4.18	<p><i>Add the following after the last paragraph:</i></p> <p>"These provisions are complemented by those listed under the ESHS Specifications which the Contractor must ensure full compliance with."</p>
Progress Reports	4.21	<p><i>At the end of item (h), add the following:</i></p> <p>"Details and dates relating to the personnel deployed through the design and execution to the completion of the Works shall be included in those comparisons."</p> <p><i>Add the following new item at the end of the Sub-Clause:</i></p> <p>"(i) matters requested under the ESHS Specifications."</p>
On-Site Log Book	4.25	<p><i>Additional Sub-Clause:</i></p> <p>"The Contractor shall maintain on Site a log book, in a form approved by the Engineer and which shall integrate the fields required in the Specification. It will be used to record the Contractor's activities on a daily basis, and any instruction from the Engineer given on Site. The Employer's Personnel shall have the right of access to this document at all times, and one copy of each daily record shall be promptly provided by the Contractor to the Engineer."</p>
Facilities for Staff and Labour	6.6	<p><i>The last paragraph is deleted in its entirety and replaced by the following:</i></p> <p>"The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the Site, except with the prior and express Employer's consent. The Employer and/or the Engineer may inspect the living quarters from time to time in order to verify their compliance with the Laws and the Contract. The Contractor shall accordingly grant the Employer and/or the Engineer full access to the living quarters as and when they require."</p>
Health and Safety	6.7	<p><i>Add the following at the end of the Sub-Clause:</i></p> <p>"These provisions are complemented by those listed under the ESHS Specifications which the Contractor must ensure full compliance with."</p>
Inspection	7.3	<p><i>In the first sentence of the last paragraph, add:</i></p> <p>", in accordance with the Specification," <i>after</i> "notice to the Engineer," <i>and before</i> "whenever"</p> <p><i>In the last sentence of the last paragraph:</i></p> <ul style="list-style-type: none"> - Add "within the prescribed period" <i>after</i> "notice", <i>and</i> - Add "risk and" <i>before</i> "cost".

Conditions	Sub-Clause	Specific provisions
Testing	7.4	<p><i>Add the following at the end of the 2nd paragraph:</i></p> <p>"The Contractor shall carry out such further tests as may be required under the applicable Laws and as may be required by the relevant legally constituted public authorities in the Country in order for them to approve the completed Works. Any tests required by the applicable Laws or legally constituted authorities are deemed never to be varied or additional tests and are to be carried out by the Contractor at his risk and expense."</p> <p><i>In the 4th paragraph, replace "not less than 24 hours' notice" by "24 hours' notice, unless a longer period is indicated in the Specifications."</i></p>
Commencement of Works	8.1	<p><i>Insert the following after "Sub-Clause 16.2 [Termination by contractor]" and before "":</i></p> <p>"unless the Contractor has caused, or contributed in any respect to, any non-fulfilment of one or all of these precedent conditions."</p> <p><i>Add the following at the end of the Sub-Clause:</i></p> <p>"As defined in the ESHS Specifications (if any), no physical work may commence on any Project Area until such time the Contractor has prepared and submitted to the Engineer the Worksite - ESMP, and the annexed EPP corresponding to a Project Area, and the Engineer has approved those."</p>
Extension of Time for Completion	8.4	<p><i>Replace the first paragraph by the following:</i></p> <p>"The Contractor shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to an extension of the Time for Completion if and to the extent that any of the following causes affect his ability to meet the Time for Completion:"</p> <p><i>Add the following at the end of the Sub-Clause:</i></p> <p>"However the Contractor's entitlement to an extension of time shall be reduced if and to the extent that the Contractor's failure to use all reasonable endeavours to mitigate any such delay has contributed to the delay.</p> <p>Any extension of Time for Completion granted to the Contractor shall, except where the Contractor is entitled to an increase in the Contract Price in accordance with other provisions of the Contract, be deemed to be full compensation and satisfaction for any loss or damage sustained or to be sustained by the Contractor in respect of the matter or thing in connection with which such extension shall have been granted."</p>
Suspension of Work	8.8	<p><i>Add the following after the last sentence of the Sub-Clause:</i></p> <p>"As an example, and without limitation to other possible causes, any suspension of work caused by any failure from the Contractor to comply with the obligations stated:</p> <ul style="list-style-type: none"> - under the ESHS Specifications (if any), in the event of a level 3 non-compliance; - under Sub-Clause 4.8 as to safety procedures; - under Sub-Clause 4.9 as to the quality assurance; - under Sub-Clause 4.18 as to the protection of the environment; or - under Sub-Clause 6.7 as to health and safety; <p>shall be considered as cause of suspension which is the responsibility of the Contractor."</p>
Delayed Tests	9.2	<p><i>In the 2nd paragraph, add the following in between</i></p>

Conditions	Sub-Clause	Specific provisions
		<p>"21 days"and"after":</p> <p>", or any other period instructed by the Engineer in accordance with and taking due regard of the Contract,"</p> <p><i>In the 3rd paragraph, add the following in between "21 days" and ",":</i></p> <p>", or any other period instructed by the Engineer under the former paragraph,"</p>
Failure to Pass Tests on Completion	9.4	<p><i>Add the following item d) after item c):</i></p> <p>"d) instruct the Contractor to carry out any remedial work, as provided for in Sub-Clause 7.6 [<i>Remedial Work</i>]"</p>
Taking Over of Parts of the Works	10.2	<p><i>Add the following at the end of the 3rd paragraph:</i></p> <p>"For the sake of clarity, the Defect Notification Period of a part of the Works which has been taken over under this Sub-Clause will expire when the Defect Notification Period of the Works as a whole, or of the Section to which the part is related, as the case may be, will expire. It will then typically be longer than the latter."</p>
Works to be Measured	12.1	<p><i>If the option "full Lump Sum" has been selected in Sub-Clause 14.1 of these Particular Conditions, then:</i></p> <p>Clause 12 is not applicable.</p> <p><i>If the option "a mix of Lump Sum Price Component and Admeasurement Component" has been selected in Sub-Clause 14.1 of these Particular Conditions, replace all text before item (a) in the Sub-Clause by the following:</i></p> <p>"The Admeasurement Component of the Works shall be measured, and valued for payment, in accordance with this Clause. The Contractor shall show in each application under Sub-Clauses 14.3 [<i>Application for Interim Payment Certificates</i>], 14.10 [<i>Statement on Completion</i>] and 14.11 [<i>Application for Final Payment Certificate</i>] the quantities and other particulars detailing the amounts which he considers to be entitled under the Contract.</p> <p>Whenever the Engineer requires any part of the Admeasurement Component of the Works to be measured, reasonable notice shall be given to the Contractor's Representative, who shall:"</p>
Evaluation	12.3	<p><i>If the option "full Lump Sum" has been selected in Sub-Clause 14.1 of these Particular Conditions, then:</i></p> <p>Clause 12 is not applicable.</p> <p><i>If the option "a mix of Lump Sum Price Component and Admeasurement Component" has been selected in Sub-Clause 14.1 of these Particular Conditions, delete the first paragraph in its entirety and replace it by the following:</i></p> <p>"Except as otherwise stated in the Contract, the Engineer shall proceed in accordance with Sub-Clause 3.5 [<i>Determinations</i>] to agree or determine the part of the Contract Price attributable to the Admeasurement Component of the Works by evaluating each item of work, applying the measurement agreed or determined in accordance with the above Sub-Clauses 12.1 and 12.2 and the appropriate rate or price for the item."</p>
Right to Vary	13.1	<p><i>Add the following sentence at the end of the first paragraph:</i></p> <p>"Variations shall be strictly limited to what is directly related to and necessary for the Permanent Works, and to what falls under the skills, experience and trades of the Contractor."</p>
Variation Procedure	13.3	<p><i>If the option "a mix of Lump Sum Price Component and Admeasurement Component" has been selected in Sub-Clause</i></p>

Conditions	Sub-Clause	Specific provisions
		<p><i>14.1 of these Particular Conditions, replace the last paragraph in its entirety and replace it by the following:</i></p> <p>"To the extent that the Variation relates to the Admeasurement Component of the Works, the Variation shall be evaluated in accordance with Clause 12, unless the Engineer instructs or approves otherwise in accordance with this Sub-Clause.</p> <p>To the extent that the Variation relates to the Lump Sum Price Component of the Works, the Engineer shall proceed in accordance with Sub-Clause 3.5 [<i>Determinations</i>] to agree or determine adjustments to the Contract Price and the schedule of payments under Sub-Clause 14.4, unless the Engineer instructs or approves otherwise in accordance with this Sub-Clause. These adjustments shall include reasonable profit."</p> <p><i>If the option "full Lump Sum" has been selected in Sub-Clause 14.1 of these Particular Conditions, replace the last paragraph in its entirety with the following:</i></p> <p>"Upon instruction of approving a Variation, the Engineer shall proceed in accordance with Sub-Clause 3.5 [<i>Determinations</i>] to agree or determine adjustments to the Contract Price and to the schedule of payments under Sub-Clause 14.4. These adjustments shall include reasonable profit, and shall take account of the Contractor's submissions under Sub-Clause 13.2 [<i>Value Engineering</i>] if applicable."</p>
Adjustments for Changes in Legislation	13.7	<p><i>Add the following paragraph at the end of the Sub-Clause:</i></p> <p>"If the Contractor benefits or will benefit from reduced Cost as a result of such changes, the Engineer shall, subject to Sub-Clause 2.5 [<i>Employer's Claims</i>], proceed in accordance with Sub-Clause 3.5 [<i>Determinations</i>], to agree or determine the amount to be deducted from the Contract Price."</p>
Contract Price	14.1(a)	<p><i>If the option "a mix of Lump Sum Price Component and Admeasurement Component" has been selected above, replace item (a) in its entirety by the following:</i></p> <p>"(a) The Contract Price is the aggregate of:</p> <ul style="list-style-type: none"> (i) the sum stated in the Letter of Acceptance as being the Lump Sum Price Component of the Works, forming part of the Accepted Contract Amount, and (ii) the sum agreed or determined under Sub-Clause 12.3 [<i>Evaluation</i>] as payable to the Contractor for the Admeasurement Component of the Works, for which a notional amount forming part of the Accepted Contract Amount is stated in the Letter of Acceptance." <p><i>If the option "full Lump Sum" has been selected above, replace items (a) and (b) of the Sub-Clause by the following:</i></p> <p>"(a) The Contract Price shall be the lump sum Accepted Contract Amount and be subject to adjustments in accordance with the Contract;"</p> <p><i>And replace item (c) in its entirety by the following:</i></p> <p>"(c) Any quantities or price data which may be set out in a Schedule shall be used for the purposes stated in the Schedule and may be inapplicable for other purposes."</p>
	14.1(d)	<p>If requested by the Engineer, the breakdown of all unit prices shall also be submitted by the Contractor within 28 days from the Commencement Date.</p>
	14.1(e)	<p><i>Add the following new item (e) at the end of the Sub-Clause:</i></p> <p>"(e) Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts</p>

Conditions	Sub- Clause	Specific provisions
		<p>therefore, imported by the Contractor for the sole purpose of executing the Contract shall be temporarily exempt from the payment of import duties and taxes upon initial importation, provided the Contractor shall post with the customs authorities at the port of entry an approved export bond or bank guarantee, valid until the Time for Completion plus six months, in an amount equal to the full import duties and taxes which would be payable on the assessed imported value of such Contractor's Equipment and spare parts, and callable in the event the Contractor's Equipment is not exported from the Country on completion of the Contract. A copy of the bond or bank guarantee endorsed by the customs authorities shall be provided by the Contractor to the Employer upon the importation of individual items of Contractor's Equipment and spare parts.</p> <p>Upon export of individual items of Contractor's Equipment or spare parts, or upon the completion of the Contract, the Contractor shall prepare, for approval by the customs authorities, an assessment of the residual value of the Contractor's Equipment and spare part to be exported, based on the depreciation scale and other criteria used by the customs authorities for such purposes under the provisions of the applicable Laws. Import duties and taxes shall be due and payable to the customs authorities by the Contractor on (a) the difference between the initial imported value and the residual value of the Contractor's Equipment and spare parts to be exported; and (b) on the initial imported value that Contractor's Equipment and spare parts remaining in the Country after completion of the Contract. Upon payment of such dues within 28 days of being invoiced, the bond or bank guarantee shall be reduced or released accordingly; otherwise the security shall be called in the full amount remaining."</p>
Application for Interim Payment Certificates	14.3	<i>In the first sentence of the first paragraph, replace "six" by: "onesoft (paper) copy and twohard (digital)".</i>
Issue of Interim Payment Certificates	14.6	<i>Add the following sentence at the end of the first paragraph: "The Engineer may withhold any amount up to one hundred percent (100%) of the certification at its discretion in the event that the monthly progress report to be submitted with the Contractor's Statement is missing any of the information listed in paragraphs (a) to (h) of Sub-Clause 4.21 [Progress reports]. Such withheld amounts shall be released in the Interim Payment Certificate in the month following the Contractor's submission of the missing information."</i>
Payment	14.7	<i>Add the following sentence at the end of the Sub-Clause: "The payment period defined in item (b) above can be suspended for reasons defined in the Contract, in particular in the event of an unresolved level 3 non-compliance specified in the ESHS Specifications if any. Such suspension shall not entitle the Contractor to any additional payment under Sub-Clause 14.8 [Delayed Payment] or otherwise"</i>
Statement at Completion	14.10	<i>In the first paragraph, replace "six" by: "one soft (paper) copy and two hard (digital)".</i>
Application for Final Payment Certificate	14.11	<p><i>In the first paragraph, replace "six" by: "one soft (paper) copy and two hard (digital)".</i></p> <p><i>In the 3rd paragraph, add "by latest 56 days after the receipt of the draft final statement", after "the Engineer shall deliver".</i></p> <p><i>In the 3rd paragraph, add the following sentence before the last</i></p>

Conditions	Sub- Clause	Specific provisions
		<p>sentence:</p> <p>"Failure by the Engineer to deliver such Interim Payment Certificate within that period shall constitute a dispute."</p>
<p>Direct Payments to Subcontractors</p>	<p>14.16</p>	<p><i>Il the option "for direct payment of Subcontractors" has been selected in Sub-Clause 4.4 of the Particular Conditions, then:</i></p> <p>"Payment for work by a Subcontractor which is entitled to be paid directly shall be made in accordance with the Contract, or an addendum or amendment thereof.</p> <p>When a Subcontractor is entitled to be paid directly by the Employer, the Contractor must furnish together with the Application for Interim Payment Certificates as per Sub-Clause 14.3 or the Application for Final Payment Certificate as per Sub-Clause 14.11 a statement indicating the amount to be deducted from the Payment Certificate and to be paid directly by the Employer to the said Subcontractor, as well as the various payment currencies and amounts.</p> <p>Payments to the Subcontractor shall be made on the basis of the statement submitted by the Contractor as mentioned here above and as accepted by the Contractor.</p> <p>The aggregate amount of direct payments to a Subcontractor calculated under the conditions prevailing on the month in which the Contract Price was established (the Base Date) may not exceed the amount of the subcontract as shown in the Contract.</p> <p>The Contractor only is entitled to submit the application for Interim or Final Payment Certificate; only claims submitted or transmitted by the Contractor shall be considered.</p> <p>Upon receipt of the Contractor statement requesting direct payment of the Subcontractor, the Employer shall directly notify the Subcontractor of the date of receipt and the amounts agreed by the Contractor for direct payment.</p> <p>Direct payments of the Subcontractor must be effected within the time specified in Sub-Clause 14.7 for payment of the Contractor. A notification of the direct payment shall be issued by the Employer to the Contractor and the Subcontractor.</p> <p>Within fifteen (15) days of receipt of the documents supporting a direct payment request from the Subcontractor, the Contractor shall give its agreement or notify its refusal with justification to the Subcontractor, failing which the Contractor shall be deemed to have agreed to whichever supporting documents it did not expressly accept or reject. In case the Contractor does not notify its refusal with justification of a request for direct payment from a Subcontractor or transmit it to the Employer within the time indicated above, the Subcontractor is entitled to send a copy of the request for direct payment directly to the Employer, together with a copy of the proof of receipt of the original by the Contractor.</p> <p>Thereafter the Employer shall (i) promptly request the Contractor to submit evidence within fifteen (15) days that the Contractor rejected the said request for direct payment with justification within the time specified above, and (ii) inform the Subcontractor accordingly. If the Contractor fails to provide the requested evidence within 15 days, the Employer may directly pay the Subcontractor, up to the amount due under payment certificates claimed by the Contractor."</p>
<p>Termination by Employer</p>	<p>15.2</p>	<p><i>Add the following, after item (f) in the first paragraph:</i></p> <p>"(g) Substantially fails to comply with the ESHS Specifications."</p>

Conditions	Sub- Clause	Specific provisions
Valuation at Date of Termination	15.3	<p><i>Add the following at the end of sub-Clause, after "Contract" and before".":</i></p> <p>" , except that the Engineer will be under no obligation to consult with the Contractor before making his determination, but may consult with the Contractor at his sole discretion."</p>
Corrupt or Fraudulent Practices	15.6	<p><i>Add the following at the end of the Sub-Clause:</i></p> <p>"In addition to the provisions of this Sub-Clause, the Contractor is also bound by the provisions found under Appendix B to the General Conditions, named "Corrupt and Fraudulent Practices Policy – Social and Environmental Responsibility."</p>
Duty to Minimize Delay / renamed as "Duty to Minimize Delay and Cost"	19.3	<p><i>In the first paragraph, add "and/or Cost, including but not limited to those to the Works," after"delay".</i></p>
Optional Termination, Payment and Release	19.6	<p><i>In the 2nd paragraph, replace "the Engineer shall determine" par the following:</i></p> <p>"the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine".</p>
Contractor's Claims	20.1	<p><i>Add the following sentence at the end of the 4th paragraph:</i></p> <p>"As long as the event or circumstance giving rise to the claim continues having effect, the Contractor shall use all reasonable endeavours to minimize any incurred delay and/or Cost, including but not limited to those to the Works."</p>
Failure to Comply with Dispute Adjudication Board's Decision	20.7	<p><i>Delete Sub-Clause 20.7 in its entirety and replace it by the following:</i></p> <p>"In the event that a Party fails to comply with any decision of the DAB, whether binding, or final and binding, then the other Party may, without prejudice to any other rights it may have, refer the failure itself to arbitration under Sub-Clause 20.6 [Arbitration] for summary or other expedited relief, as may be appropriate.</p> <p>Sub-Clause 20.4 [Obtaining Dispute Adjudication Board's Decision] and Sub-Clause 20.5 [Amicable Settlement] shall not apply to this reference."</p>

Section X – Contract Forms

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Notification of Award

Letter of Acceptance

[Letterhead paper of the Employer]

Date: _____ *[Insert Date]*

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

This is to notify you that your Bid dated _____ *[Insert date]* for execution of the _____ *[name of the Contract and identification number, as given in the Contract Data]* for the Accepted Contract Amount *[amount in numbers and words] [name of currency]*, as corrected and modified in accordance with the Instructions to Bidders, is hereby accepted by our institution.

You are requested to furnish the Performance Security within 28 days in accordance with ITB 42, using for that purpose the Performance Security Form included in Section X, Contract Forms, of the Bidding Documents.

Authorized Signature: _____

Name and Title of Signatory: _____

Name of institution: _____

Attachment: Contract Agreement

Contract Agreement

THIS AGREEMENT made the _____ day of _____, _____, between _____ of _____ (hereinafter "**the Employer**"), of the one part, and _____ of _____ (hereinafter "**the Contractor**"), of the other part:

WHEREAS the Employer desires that the Works known as _____ 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, in the sum of *[insert Accepted Contract Amount in words and figures, expressed in the Contract currency(ies)]* (hereafter called the "**Accepted Contract Amount**").

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. The priority of the documents shall be in accordance with the following documents:
 - a) The Letter of Acceptance;
 - b) The Letter of Bid and Appendix to Bid (including the signed Statement of Integrity);
 - c) The addenda Nos _____ (if any);
 - d) The Particular Conditions;
 - e) The General Conditions;
 - f) The Specifications;
 - g) The Drawings;
 - h) The completed Price Schedules (BoQ); and
 - i) The Contractor's Bid and any other documents forming part of the contract.
3. In consideration of the payments to be made by the Employer to the Contractor as specified 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 _____ on the day, month and year specified above.

Signed by _____ (for the Employer)

Signed by _____ (for the Contractor)

Performance Security

Demand guarantee

Beneficiary: _____

Date: _____

PERFORMANCE GUARANTEE No.: _____

Guarantor: _____

We have been informed that _____ (hereinafter called "**the Bidder**") has entered into Contract No. _____ dated _____ with the Beneficiary, for the execution of _____ (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 Bidder, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ [*insert amount in figures*] (_____) [*insert amount in words*]¹ such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's first demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Bidder is in breach of its obligation(s) under the Contract, without the Beneficiary 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 _____ 2 _____², and any demand for payment under it must be received by us at this office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

_____ [*Signature*]

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

¹ The Guarantor shall insert an amount representing the percentage of the Contract Price specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency(cies) of the Contract or a freely convertible currency acceptable to the Beneficiary.

² Insert the date twenty-eight days after the expected completion date as described in GC Clause 11.9. The Employer should note that in the event of an extension of this date for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [*six months*]/[*one year*], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

Advance Payment Security

Demand Guarantee

Beneficiary: _____

Date: _____

ADVANCE PAYMENT GUARANTEE No.: _____

Guarantor: _____

We have been informed that _____ (hereinafter called "**the Bidder**") has entered into Contract No. _____ dated _____ with the Beneficiary, for the execution of _____ (hereinafter called "**the Contract**").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum _____ *[amount in numbers and words]* is to be made against an advance payment guarantee.

At the request of the Bidder, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ *[insert amount in figures]* (_____) *[insert amount in words]*¹ upon receipt by us of the Beneficiary's first demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Bidder:

- a) Has used the advance payment for purposes other than the costs of mobilization in respect of the Works; or
- b) Has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Bidder has failed to repay.

A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the advance payment referred to above has been credited to the Bidder on its 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 Bidder as specified 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 ninety (90) percent of the Accepted Contract Amount, less Provisional Sums, has been certified for payment, or on the _____ day of _____, 2____², 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 (URDG) 2010 Revision, ICC Publication No. 758.

_____ *[Signature]*

¹ The Guarantor shall insert an amount representing the amount of the advance payment and 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.

² 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 *[six months]**[one year]*, in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

Retention Money Security

Demand Guarantee

_____ [Guarantor letterhead or SWIFT identifier code]
Beneficiary: _____ [Insert name and address of Employer]
Date: _____ [Insert date of issue]
RETENTION MONEY GUARANTEE No.: _____ [insert guarantee reference number]
Guarantor: _____ [Insert name and address of place of issue, unless indicated in the letterhead]

We have been informed that _____ [insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture] (hereinafter called "**the Bidder**") has entered into Contract No. _____ [insert reference number of the contract] dated _____ with the Beneficiary, for the execution of _____ [insert name of contract and brief description of Works] (hereinafter called "**the Contract**").

Furthermore, we understand that, according to the Conditions of the Contract, the Beneficiary retains moneys up to the limit set forth in the Contract ("**the Retention Money**"), and that when the Taking-Over Certificate has been issued under the Contract and the first half of the Retention Money has been certified for payment, payment of the second half of the Retention Money (or, if the amount guaranteed under the Performance Security when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security) is to be made against a Retention Money guarantee.

At the request of the Bidder, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ [insert amount in figures] (_____) [insert amount in words]¹ upon receipt by us of the Beneficiary's first demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Bidder is in breach of its obligation(s) under the Contract, without your needing to prove or show grounds for your demand or the sum specified therein.

A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the second half of the Retention Money as referred to above has been credited to the Bidder on its account number _____ at _____ [insert name and address of Bidder's bank].

This guarantee shall expire, no later than the _____ day of _____ 2 _____², and any demand for payment under it must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

_____ [Signature]

¹ The Guarantor shall insert an amount representing the amount of the second half of the Retention Money or if the amount guaranteed under the Performance Security when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security and denominated either in the currency(ies) of the second half of the Retention Money as specified in the Contract, or in a freely convertible currency acceptable to the Beneficiary.

² Insert the same expiry date as set forth in the performance security, representing the date twenty-eight days after the completion date described in GC Clause 11.9. The Employer should note that in the event of an extension of this date for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."