KOLHAPUR ZILLA SAHAKARI DUDH UTPADAK SANGH Ltd. KOLHAPUR.


NCB-Bid: GOKUL:NDP1:NCB:01/2016

NATIONAL COMPETITIVE BIDDING

| NAME OF WORK | Civil work for Strawenrichment & Densification Plant at Mahalaxmi Cattlefeed Plant, Gad-Mudshingi, Tal. – Karveer, Dist.- Kolhapur For Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur. |
| PERIOD OF SALE OF BIDDING | FROM Dt. 15/01/2016 To Dt. 15/02/2016 (Up to 3.00 p.m.) |
| TIME AND DATE OF HOURS PRE-BID CONFERENCE | No Pre Bid Conference |
| LAST DATE AND TIME FOR HOURS RECEIPT OF BIDS | DATE: 16/02/2016 TIME 3.00 P.M. |
| DATE OF BID OPENING | DATE: 16/02/2016 TIME 3.30 P.M. |
| OFFICER INVITING BIDS | Managing Director |
INVITATION FOR BID

Section I. Instructions to Bidders
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   Salient Features of Labour Laws
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   Form of Bid Security (Bank Guarantee)-Annexure A
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   Attachment
   Amendments for Permitting Joint Ventures
INVITATION FOR BID
(IFB)
GOKUL:NDP1:NCB:01/2016
KOLHAPUR ZILLA SAHAKARI DUDH UTAPADAK SANGH LTD. KOLHAPUR.


For Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur.

INVITATIONS FOR BIDS (IFB)
NATIONAL COMPETITIVE BIDDING

Date: Bid No.: 1 KOLHAPUR

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Government of India has received financing from the World Bank towards the cost of National Dairy Support Project (NDP I). Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur as an End Implementing Agency of the project intends to apply a part of the funds to cover eligible payments under the contracts for construction of works as detailed below. Bidding will be conducted through National Competitive Bidding procedures agreed with the World Bank. Bidding is open to all eligible bidders as defined in the IBRD Guidelines for Procurement. Bidders from India should, however, be registered with the Government of India or other State Governments/ Government of India, or State/Central Government Undertakings. Bidders from India, who are not registered as above, on the date of bidding, can also participate provided they get themselves registered by the time of contract signing, if they become successful bidders. Bidders are advised to note the clauses on eligibility (Section I Clause 4 and minimum qualification criteria (Section I Clause 5) of the Instructions to Bidders to qualify for the award of the contract.</td>
</tr>
<tr>
<td>2</td>
<td>Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur invites bids for the construction of works detailed in the table. The bidders may submit bids for any or all of the works indicated in the table below.</td>
</tr>
<tr>
<td>3</td>
<td>Bidding documents (and additional copies) may be purchased from the office of Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur. From 15/01/2016 to 15/02/2016 for a non-refundable fee (three sets) as indicated, in the form of cash or Demand Draft on any Scheduled bank payable at Kolhapur, in favour of Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur. Interested bidders may obtain further information at the same address. Bidding documents requested by mail will be dispatched by registered/speed post on payment of an extra amount of Rs. 500/- The Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur, will not be held responsible for the postal delay if any, in the delivery of the documents or non-receipt of the same. Bidders can also download the bid document from kolhapur website. (<a href="http://www.gokulmilk.coop">www.gokulmilk.coop</a>). The bidders who have download it the bid document</td>
</tr>
</tbody>
</table>
shall be solely responsible for checking this website for any addendum/amendment issued subsequent to the bid document, and take into consideration the same while preparing and submission of bids. The bidders who have downloaded the document should attach a draft towards the cost of document along with their bid.

4. Bids must be accompanied by security of the amount specified for the work in the table below, drawn in favour of Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd., Kolhapur. Bid security will have to be in any one of the forms as specified in the bidding document and shall have to be valid for 45 days beyond the validity of the bid.

5. Bids must be delivered to Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd., Kolhapur, on or before 3.00 P.M...hours on 16/02/2016 and will be opened on 16/02/2016 at 3.30 P.M., in the presence of the bidders who wish to attend. If the office happens to be closed on the date of receipt of the bids as specified, the bids will be received and opened on the next working day at the same time and venue. Late Bids will be rejected.

6. A pre-bid meeting is not required for this bid.

7. Other details can be seen in the bidding documents.

8. The address for communication is as under:

<table>
<thead>
<tr>
<th>a) Name &amp; Designation of Officer, Official Address</th>
<th>Managing Director Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. B-1, M.I.D.C. Gokul Shirgaon, Kolhapur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johnny</td>
<td><a href="mailto:civil@gokulmilk.coop">civil@gokulmilk.coop</a></td>
</tr>
<tr>
<td>c) Email</td>
<td>0231-2672311 to 15, Fax : 0231-2672374</td>
</tr>
<tr>
<td>d) Contact person</td>
<td>Mr.P.M.Adnaik (Asst. Manager, Civil)</td>
</tr>
</tbody>
</table>

**TABLE**

<table>
<thead>
<tr>
<th>Package No.</th>
<th>Name of work</th>
<th>Bid security (RS.)</th>
<th>Cost of Document (RS.)</th>
<th>Period of Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Civil work for Strawenrichment &amp; Densification Plant at Mahalaxmi Cattlefeed Plant, Gad-Mudshingi, Tal – Karveer, Dist.- Kolhapur . For Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur.</td>
<td>5.00 Lacs</td>
<td>2,000.00 Non refundable</td>
<td>8 months</td>
</tr>
</tbody>
</table>
I. Instructions to Bidders

Table of Clauses

A. General
   1. Scope of Bid
   2. Source of Funds
   3. Corrupt and Fraudulant Practices
   4. Eligible Bidders
   5. Qualifications of the Bidder
   6. One Bid per Bidder
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   8. Site Visit

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   34. Notification of Award and Signing of Agreement
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**Instructions to Bidders (ITB)**

### A. General

#### 1. Scope of Bid

1.1 The Employer as defined in Section II “Bidding Data Sheet” (BDS), invites bids for the construction of Works, as described in the BDS and Section VII, “Particular Conditions of Contract” (PCC). The name and identification number of the Contract are provided in the BDS and the PCC.

1.2 The successful Bidder shall be expected to complete the Works by the Intended Completion Date specified in the BDS and PCC 1.1 (v).

1.3 Throughout these Bidding Documents:
   - (a) The term “in writing” means communicated in written form (e.g. by mail, e-mail, fax, telex,) with proof of receipt;
   - (b) if the context so requires, “singular” means “plural” and vice versa; and
   - (c) “Day” means calendar day.

#### 2. Source of Funds

2.1 The Government of India or the Recipient (hereinafter called “Borrower”) specified in the BDS has received/applied for financing (hereinafter called “funds”) from the International Bank for Reconstruction and Development or the International Development Association (hereinafter called “the Bank”) in an amount specified in the BDS, towards the cost of the project specified in the BDS. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.

2.2 Payment by the Bank will be made only at the request of the Borrower and upon approval by the Bank, and will be subject, in all respects, to the terms and conditions of the Loan (or other financing) Agreement. The Loan (or other financing) Agreement prohibits a withdrawal from the Loan (or other financing) account for the purpose of any payment to persons or entities, or for any import of goods, if such payment or import, to the knowledge of the Bank, is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations. No party other than the Borrower shall derive any rights from the Loan (or other financing) Agreement or have any claim to the proceeds of the Loan (or other financing).

#### 3. Fraud and Corruption

3.1 The Bank requires compliance with its policy in regard to corrupt and fraudulent practices as set forth in Section V.

3.2 In further pursuance of this policy, Bidders shall permit and shall cause its agents (whether declared or not), sub-contractors, sub-consultants, service providers, or suppliers and any personnel thereof, to permit the Bank 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 the Bank.
4. Eligible Bidders

4.1 A Bidder, and all parties constituting the Bidder, may have the nationality of any country, subject to the provisions of Section III, Eligible Countries. A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, incorporated, or registered and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors.

4.2 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest for the purpose of this bidding process, if the Bidder:

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

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

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

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

v. 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

vi. or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of the bid; or

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

viii. would be providing goods, works, or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of the project specified in the BDS ITB 2.1 that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm;

ix. has a close business or family relationship with a professional staff of the Borrower (or of the project implementing agency, or of a recipient of a part of the loan) 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 the Bank throughout the procurement process and execution of the contract.

4.3 A Bidder may have the nationality of any country, subject to the restrictions pursuant to ITB4.7. A Bidder shall be deemed to have the nationality of a country if the Bidder is constituted, incorporated or registered in &
operates in conformity with the provisions of the laws of that country, as evidenced by its articles of incorporation (or equivalent documents of constitution or association) and its registration documents, as the case may be. This criterion also shall apply to the determination of the nationality of proposed sub-contractors or sub-consultants for any part of the Contract including related Services.

4.4 A Bidder that has been sanctioned by the Bank in accordance with the above ITB 3.1, including in accordance with the Bank’s Guidelines on Preventing and Combating Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants (“Anti-Corruption Guidelines”), shall be ineligible to be prequalified for, bid for, or be awarded a Bank-financed contract or benefit from a Bank-financed contract, financially or otherwise, during such period of time as the Bank shall have determined. The list of debarred firms and individuals is available at the electronic address specified in the BDS.

4.5 Bidders that are Government-owned enterprises or institutions in the Employer’s Country may participate only if they can establish that they (i) are legally & financially autonomous (ii) operate under commercial law, and (iii) are not dependent agencies of the Employer. To be eligible, a government-owned enterprise or institution shall establish to the Bank’s satisfaction, through all relevant documents, including its Charter and other information the Bank may request, that it: (i) is a legal entity separate from the government (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 the government, can acquire rights and liabilities, borrow funds and be liable for repayment of its debts, and can be declared bankrupt; and (iv) is not bidding for a contract to be awarded by the department or agency of the government which under their applicable laws or regulations is the reporting or supervisory authority of the enterprise or has the ability to exercise influence or control over the enterprise or institution.

4.6 Not Used.

4.7 Firms and individuals may be ineligible if so indicated in Section III and (a) as a matter of law or official regulations, the Borrower’s country prohibits commercial relations with that country, provided that the Bank is satisfied that such exclusion does not preclude effective competition for the supply of goods or the contracting of works or services required; or (b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower’s country prohibits any import of goods or contracting of works or services from that country, or any payments to any country, person, or entity in that country.

4.8 Bidder shall provide such evidence of eligibility satisfactory to the Employer, as the Employer shall reasonably request.
5.1 All bidders shall provide in Section IV, “Form of Bid, Qualification Information, Letter of Acceptance & Agreement,” a preliminary description of the proposed work method and schedule, including drawings and charts, as necessary, as further elaborated in ITB Clause 5.3(k).

5.2 In the event that prequalification of potential bidders has been undertaken, only bids from prequalified bidders shall be considered for award of Contract. These qualified bidders should submit with their bids any information updating their original prequalification applications. The update or confirmation should be provided in Section IV. With the updated information the bidder must continue to be qualified in accordance with the criteria laid down in the prequalification document. All bidder shall also furnish the information for the following in Section IV irrespective of the bidders being pre-qualified:

(i) Power of Attorney.

(ii) Evidence of access to or availability of credit facilities certified by bankers.

(iii) Details as stipulated in clause 5.3 (g) to (k)

5.3 If the Employer has not undertaken prequalification of potential bidders, all bidders shall include the following information and documents with their bids in Section IV, unless otherwise stated in the BDS:

(a) copies of original documents defining the constitution or legal status, place of registration, and principal place of business of the Bidder; written power of attorney of the signatory of the Bid to commit the Bidder;

(b) total monetary value of construction works performed for each of the last five years;

(c) experience in works of a similar nature and size for each of the last five years, and details of work under way or contractually committed; and clients who may be contacted for further information on those contracts;

(d) list of major items of construction equipment proposed to carry out the Contract;

(e) qualifications and experience of key site management and technical personnel proposed for the Contract;

(f) reports on the financial standing of the Bidder, such as profit and loss statements and auditor’s reports for the past five years;

(g) evidence of adequacy of working capital for this Contract (access to line(s) of credit and availability of other financial resources);

(h) authority to seek references from the Bidder’s bankers;

(i) information regarding any litigation, current or during the last five years, in which the Bidder was/is involved, the parties concerned, and the disputed amounts; and awards;

(j) Proposals for subcontracting components of the Works amounting to
more than 10 percent of the Contract Price. The ceiling for sub contractor's participation is stated in the BDS [for each the qualification and experience of the identified sub-contractor in the relevant field should be annexed. No vertical splitting of work for subcontracting is acceptable]

(k) The proposed methodology and program of construction including Environment Management Plan backed with equipment, materials and manpower planning and deployment, duly supported with broad calculations and quality control procedures proposed to be adopted, justifying their capability of execution and completion of the work as per technical specifications within the stipulated period of completion as per milestones.
5.4 Where it is proposed to accept Joint Ventures, incorporate all changes as indicated at the end of this document; otherwise state here as ‘Bids from Joint ventures are not acceptable’

5.5 To qualify for award of the Contract, the bidder in its name should have, in the last five years, as specified in the BDS, the following experience and licenses:

| A | a | achieved in at least two financial years, a minimum annual financial turnover (in all cases of civil engineering construction works of similar nature only) as specified in BDS; |
|   | b | satisfactorily completed (not less than 90% of contract value), as prime Contractor (or as a sub-contractor duly certified by the employer / main contractor) at least one similar work of value not less than the amount specified in BDS |
|   | c | Executed in any one year, the minimum quantities of work specified in BDS. |
|   | d | The contractor or his identified sub-contractor should possess required valid electrical license for executing the building electrification works and should have executed similar electrical works for a minimum amount as indicated in BDS in any one year |
|   | e | The contractor or his identified sub-contractor should possess required valid license for executing the water supply/sanitary engineering works and should have executed similar water supply/sanitary engineering works for a minimum amount as stated in BDS in any one year. |

B Each bidder should further demonstrate & confirm:

| a | availability for construction work, either owned, or on lease or on hire, of the key and critical equipment stated in the BDS including equipment required for establishing field laboratory to perform mandatory tests, as stated in the BDS |
| b | Availability for construction work a Contractor’s Representative and other key technical personnel with adequate experience as stated in the BDS. |
|   | i) the near relations (defined as first blood relations, and their spouses, of the bidder or the bidder’s spouse) of persons listed in the BDS; |
|   | ii) without Government permission, any person who retired as gazetted officer within the last two years; |
| c | availability of liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the Contract, of not less than the amount specified in the BDS |

C To qualify for a package of contract made of this and other contracts for which bids are invited in the IFB, the bidder must demonstrate having experience and resources sufficient to meet the aggregate of the qualifying criteria for the individual contracts.

5.6 Sub-Contractors’ experience and resources shall not be taken into account in determining the bidder’s compliance with the qualifying criteria except to the extent stated in 5.5 A above
5.7 Bidders who meet the minimum qualification criteria will be qualified only if their available bid capacity for construction work is equal to or more than the total bid value. The available bid capacity will be calculated as under:

Assessed Available bid capacity = (A*N*1.5-B) Where

- **A** = Maximum value of civil engineering works executed in any one year during the last five years (updated to the price level of the financial year and the percentage escalation of 6% as stated in the BDS, taking into account the completed as well as works in progress).

- **N** = Number of years prescribed for completion of the works for which bids are invited (period up to 6 months to be taken as half-year and more than 6 months as one year) as specified in BDS.

- **B** = Value, at the current price level, of existing commitments and on-going works to be completed during the period of completion of the works for which bids are invited.

**Note**: The statements in Section II showing the value of existing commitments and on-going works as well as the stipulated period of completion remaining for each of the works listed should be countersigned by the Engineer in charge, not below the rank of an Executive Engineer or equivalent.

5.8 Even though the bidders meet the above qualifying criteria, they are subject to be disqualified if they have:-

- made misleading or false representations in the forms, statements, affidavits and attachments submitted in proof of the qualification requirement;

- record of poor performance such as abandoning the works, not properly completion or financial failures etc.;

- consistent history of litigation or arbitration awards against the bidder or any partner of the joint venture.

- participated in the previous bidding (if this is a re-bidding) for the same work and had quoted unreasonably high bid price and could not furnish rational justification to the employer.

6. **One Bid per Bidder**

6.1 Each Bidder shall submit only one Bid. A Bidder who submits or participates in more than one Bid (other than as a subcontractor or in cases of alternatives that have been permitted or requested) shall cause all the proposals with the Bidder’s participation to be disqualified.

7. **Cost of Bidding**

7.1 The Bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer shall in no case be responsible or liable for those costs.

8. **Site Visit**

8.1 The Bidder, at the Bidder’s own responsibility and risk, is encouraged to visit and examine the Site of Works and its surroundings and obtain 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.
### B Bidding Documents

#### 9. Contents of Bidding Documents

<table>
<thead>
<tr>
<th>9.1 The set of Bidding Documents comprises the documents listed in the table below and addenda issued in accordance with ITB Clause 11:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invitation for Bids</td>
</tr>
<tr>
<td>Section I Instructions to Bidders</td>
</tr>
<tr>
<td>Section II Bidding Data Sheet</td>
</tr>
<tr>
<td>Section III Eligible Countries</td>
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<td>Section IV Forms of Bid, Qualification Information, Letter of acceptance, Agreement</td>
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</tr>
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<td>Section X Bill of Quantities</td>
</tr>
<tr>
<td>Section XI Forms of Securities</td>
</tr>
</tbody>
</table>

#### 9.2 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 Addenda to the Bidding Documents in Accordance with ITB 11. In case of any contradiction, documents Obtained directly from the Employer shall prevail.

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

#### 10. Clarification of Bidding Documents

<table>
<thead>
<tr>
<th>10.1 A prospective Bidder requiring any clarification of the Bidding Documents may notify the Employer in writing at the Employer’s address indicated in the BDS. The Employer shall respond to any request for clarification received earlier than 14 days prior to the deadline for submission of bids. Copies of the Employer’s response shall be forwarded to all purchasers of the Bidding Documents, 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. (where electronic downloading of bid document is permitted, the employer will upload the addenda on the website and it will be the responsibility of the bidders [who downloaded the bid document] to search the website for any addenda). 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 11 and ITB 21.2.</th>
</tr>
</thead>
</table>
### 10.2 Pre-bid Meeting (NO PRE-BID MEETING)

2.1 The bidder or his official representative is invited to attend a pre-bid meeting, which will take place at the place and time stated in BDS.

2.2 The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

2.3 The bidder is requested to submit any questions in writing or by facsimile or email to reach the Employer not later than one week before the meeting.

2.4 Minutes of the meeting, including the text of the questions raised (without identifying the source of inquiry) and the responses given will be transmitted without delay to all purchasers of the bidding documents. Any modification of the bidding documents listed in Sub-Clause 9.1 which 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 Clause 11 and not through the minutes of the pre-bid meeting. (Where electronic downloading of bid document is permitted, the employer will upload the addenda on the website and it will be the responsibility of the bidders [who downloaded the bid document] to search the website for any addenda).

2.5 Non-attendance of the pre-bid meeting will not be a cause for disqualification of a bidder.

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### 11. Amendment of Bidding Documents

11.1 Before the deadline for submission of bids, the Employer may modify the Bidding Documents by issuing addenda.

11.2 Any addendum thus issued shall be part of the Bidding Documents and shall be communicated in writing to all purchasers of the Bidding Documents. Prospective bidders shall acknowledge receipt of each addendum in writing to the Employer. The Employer shall also promptly publish the addendum on the Employer’s web page in accordance with ITB 10.1.

11.3 To give prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer shall extend, as necessary, the deadline for submission of bids, in accordance with ITB Sub-Clause 21.2 below.

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### C. Preparation of Bids

12. Language of Bid

12.1 All documents relating to the Bid shall be in the English.

13. Documents Comprising the Bid

13.1 The Bid submitted by the Bidder shall comprise the following:

(a) The Letter of Bid (in the format indicated in Section IV);

(b) Bid Security, in accordance with ITB Clause 17, if required;

(c) Priced Bill of Quantities;

(d) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 19.2;

(e) Qualification Information Form and Documents;

(f) Alternative offers where invited; and any other materials required to be completed and submitted by bidders, as specified in the BDS. The documents listed in Section IV, VII, and X of sub-clause 9.1 shall be filled in.
13.2 Bidders bidding for this contract together with other contracts stated in the IFB to form a package will so indicate in the bid together with any discounts offered for the award of more than one contract.

14. **Bid Prices**

14.1 The Contract shall be for the whole Works, as described in ITB Sub-Clause 1.1, based on the priced Bill of Quantities submitted by the Bidder.

14.2 The Bidder shall fill in rates and prices and line item total (both in figures & words) for all items of the Works described in the Bill of Quantities along with total bid price (both in figures and words). Items for which no rate or price is entered by the Bidder shall not be paid for by the Employer when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities. Corrections, if any, shall be made by crossing out, initialling, dating and rewriting.

14.3 All duties, taxes, applicable service tax as per prevailing rules and other levies payable by the Contractor under the Contract, or for any other cause, shall be included in the rates, prices, and total Bid price submitted by the Bidder.

14.4 Bidders may like to ascertain availability of excise/custom duty exemption benefits available in India to the contracts financed under World Bank loan/credits. They are solely responsible for obtaining such benefits which they have considered in their bid and in case of failure to receive such benefits for reasons whatsoever, the employer will not compensate the bidder (contractor). Where the bidder has quoted taking into account such benefits, he must give all information required for issue of certificates in terms of such notifications as per form attached to the Qualification Information in the bid. To the extent the employer determines the quantity indicated therein are reasonable keeping in view the bill of quantities, construction program and methodology, the certificates will be issued within 60 days of signing of contract and no subsequent changes will be permitted. No certificate will be issued for items where no quantity/capacity of equipment is indicated in the statement. The bids which do not conform to the above provisions will be treated as non-responsive and rejected. Any delay in procurement of the construction equipment/machinery/goods as a result of the above shall not be a cause for granting any extension of time.

14.5 The rates and prices quoted by the Bidder shall be subject to adjustment during the performance of the Contract if provided for in the BDS and SCC and the provisions of Clause 47 of the General Conditions of Contract.

15. **Currencies of Bid and Payment**

15.1 The unit rates and prices shall be quoted by the Bidder entirely in Indian Rupees.

16. **Bid Validity**

16.1 Bids shall remain valid for the period specified in the BDS. A bid valid for a shorter period shall be rejected by the employer as non-Responsive.

16.2 In exceptional circumstances, prior to the expiry of the original bid validity, the Employer may request that the bidders extend the period of validity for a specified additional period. The request and the bidders’ responses shall be made in writing. If a Bid Security is requested in accordance with ITB Clause 17, it shall be extended up to 45 days after the extended deadline of the extended bid validity period. A Bidder may refuse the request without forfeiting the Bid Security. A Bidder agreeing to the request shall not be required or permitted to modify its Bid, except as provided in ITB Clause 16.3.

16.3 In the case of contracts in which the Contract Price is fixed (not subject to price adjustment), in the event that the Employer requests and the bidder agrees to the extension of the validity period, the contract price, if the Bidder is selected for award, shall be the bid price adjusted as follows: The price shall be increased by the factor (value of factor B specified in BDS) for each week or part of a week that has elapsed between the expiration of the initial bid validity and the date of issue of letter of acceptance to the successful bidder. Bid evaluation shall be
### 17. Bid Security

17.1 If required in the BDS, the Bidder shall furnish, as part of its Bid, a Bid security, in original form for the amount shown in BDS for this particular work.  

17.2 This bid security shall be in favour of, as specified in BDS, in one of the following forms:  
- A bank guarantee issued by a nationalized/scheduled bank located in India or a reputed bank located abroad in the form given in Section XI; or  
- Certified cheque or Bank draft payable to the employer as specified in BDS.  
- If the institution issuing the guarantee is located outside India, it shall be counter signed by a Nationalized/Scheduled bank located in India, to make it enforceable.  
- Fixed Deposit/Time Deposit certificates issued by a Nationalized or Scheduled Bank located in India for equivalent or higher values are acceptable provided it is pledged in favour of the agency named in BDS and such pledging has been noted and suitably endorsed by the bank issuing the deposit certificate.  
- Any other security specified in BDS  

17.3 Bank guarantee issued as Bid security for the bid shall be valid for 45 days beyond the validity of the bid.  

17.4 Any bid not accompanied by an acceptable Bid Security and not secured as indicated in Sub-Clause 17.1 to 17.3 above will be rejected by the Employer as non-responsive, pursuant to ITB Clause 27.1.  

17.5 The Bid security of unsuccessful bidders will be returned within 42 days of the end of the bid validity period specified in Sub-Clause 16.1 & 16.2. The Bid Security of successful bidders will be discharged and returned when the bidder has signed the Agreement and furnished the required Performance Security.  

17.6 The Bid Security may be forfeited:  
(a) if a Bidder withdraws/modify/substitutes its bid during the period of bid validity specified by the Bidder on the Letter of Bid, except as provided in ITB Sub-Clause 16.2; or  
(b) if the Bidder does not accept the correction of its Bid Price pursuant to ITB Sub-Clause 28.  

(c) if the successful Bidder fails within the specified time to: 

(i) sign the Contract Agreement; or  
(ii) furnish the required ‘performance security’.  

17.7 If a bid security is not required in the BDS, and (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bid, or (b) if the successful Bidder fails to: sign the Contract in accordance with ITB 34; or furnish a performance security in accordance with ITB 35; the Borrower may, if provided for in the BDS, declare the Bidder ineligible to be awarded a contract by the Employer for a period of three years.  

### 18. Alternative Proposals by Bidders  

18.1 Bidders shall submit offers that comply with the requirements of the bidding documents, including the basic technical design as indicated in the drawing and specifications. Alternatives will not be considered.  

### 19. Format and Signing of Bid  

19.1 The Bidder shall prepare one original of the documents comprising the Bid as described in ITB Clause 13, bound with the volume containing the Form of Bid, and clearly marked “ORIGINAL.” In addition, the Bidder shall submit copies of the Bid, in the number specified in the BDS, and clearly marked as “COPIES.” In the event of discrepancy between them, the original shall prevail.  

19.2 The original and all copies of the Bid shall be typed or written in indelible
ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder, pursuant to ITB Sub-Clause 5.3 (a). A copy of the legally valid authorization as specified in BDS should be attached along with 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 such as interlineations, erasures or overwriting have been made, shall be valid only if they are signed or initialed by the authorized person or persons signing the Bid.

19.3 The Bid shall contain no alterations or additions, except those to comply with instructions issued by the Employer, or as necessary to correct errors made by the Bidder, in which case such corrections shall be signed or initialed by the person or persons signing the Bid.

19.4 The Bidder shall furnish information as described in the Form of Bid on commissions or gratuities, if any, paid or to be paid to agents relating to this Bid, and to contract execution if the Bidder is awarded the contract.

D. Submission of Bids

20. Submission, Sealing and Marking of Bids

20.1 Bidders may always submit their bids by hand, hard copy of tender document duly signed and sealed only. When so specified in the BDS, bidders shall have the option of submitting their bids electronically. Bidders submitting bids electronically shall follow the procedures specified in the BDS under ITB 20.1.

The bidder shall seal the original and all copies of the bid in two inner envelopes and one outer envelop, duly marking the inner envelopes as “ORIGINAL” AND “COPIES”

20.2 The inner and outer envelopes shall

(a) be addressed to the Employer at the address provided in BDS;

(b) bear the name and identification number of the contract as defined in the BDS & PCC; and

(c) provide a warning not to open before the specified time and date for bid opening as defined in the BDS.

20.3 In addition to the identification required in ITB Sub-Clause 20.2, the inner envelopes shall indicate the name and address of the Bidder to enable the Bid to be returned unopened in case it is declared late, pursuant to ITB Clause 22. 20.4 If the outer envelope is not sealed and marked as above, the Employer shall assume no responsibility for the misplacement or premature opening of the Bid.
### 21. Deadline for Submission of Bids

| 21.1 | Bids must be received by the Employer at the address and no later than the date and time indicated in the BDS. Bidders submitting bids electronically (when permitted) shall follow the electronic bid submission procedures specified in the BDS. 21.2 The Employer may, at its discretion, extend the deadline for submission of bids by issuing an amendment in accordance with ITB Clause 11, in which case all rights and obligations of the Employer and the bidders previously subject to the original deadline shall then be subject to the new deadline. |

### 22. Late Bids

| 22.1 | The Employer shall not consider any bid that arrives after the deadline for submission of bids, in accordance with ITB 21. Any bid received by the Employer after the deadline for submission of bids shall be declared late, rejected, and returned unopened to the Bidder. |

### 23. Withdrawal, Substitution and Modification of Bids

| 23.1 | 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 19.2, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the bid must accompany the respective written notice. All notices must be: <br> (a) prepared and submitted in accordance with ITB 19 and ITB 20 (except that withdrawal notices do not require copies), and in addition, the respective envelopes shall be clearly marked “WITHDRAWAL,” “SUBSTITUTION,” “MODIFICATION;” and <br> (b) received by the Employer prior to the deadline prescribed for submission of bids, in accordance with ITB 21. Bidders may withdraw, substitute or modify their Bids by giving notice in writing before the deadline prescribed in ITB Clause 21. 23.2 Bids requested to be withdrawn in accordance with ITB 23.1 shall be returned unopened to the Bidders. 23.3 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. This will result in the forfeiture of the Bid Security pursuant to ITB 17.6. 23.4 Bidders may only offer discounts to, or otherwise modify the prices of their bids, by submitting Bid modifications in accordance with this clause ITB 23.1 or included in the initial Bid. |

### E. Bid Opening and Evaluation

| 24. Bid Opening | 24.1 Except in the cases specified in ITB 22 and 23, the Employer shall publicly open and read out in accordance with ITB 24.2 all bids received by the deadline, at the date, time and place specified in the BDS in the presence of Bidders designated representatives and anyone who choose to attend. Any specific electronic bid opening procedure required, if electronic bidding is permitted in accordance with ITB 20.1, shall be as specified in the BDS. |
24.2 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 envelopes that are opened and read out at bid opening shall be considered further.

24.3 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 (if permitted), the presence or absence of a bid security; and any other details as the Employer may consider appropriate. Only discounts and alternatives modifications read out at bid opening shall be considered for evaluation. The Letter of Bid and the Bill of Quantities are to be initialled by representatives of the Employer attending bid opening in the manner specified in the BDS. The Employer shall neither discuss the merits of any bid nor reject any bid at bid opening (except for late bids, in accordance with ITB 22.1).

24.4 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 contract if applicable, including any discounts and alternative bids; and the presence or absence of a bid security, 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.

### 25. Confidentiality

Information relating to the Examination, Clarification, Evaluation, & Comparison of Bids and Recommendations for the Award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process until publication of the award to the successful Bidder has been announced pursuant to ITB Sub-Clause 34.4. Any effort by a Bidder to influence the Employer’s processing of bids or award decisions may result in the rejection of its Bid. Notwithstanding the above, from the time of bid opening to the time of Contract award, if any Bidder wishes to contact the Employer on any matter related to the bidding process, it should do so in writing.

### 26. Clarification of Bids

To assist in the examination, evaluation, and comparison of Bids, the Employer may, at the Employer’s discretion, ask any Bidder for clarification of the Bidder’s Bid, including breakdown of unit rates. The request for clarification and the response shall be in writing, but no change including any voluntary increase or decrease, in the price or substance of the Bid shall be sought, offered, or permitted except as required to confirm the correction of
arithmetic errors discovered by the Employer in the evaluation of the Bids in accordance with ITB Clause 28.

27. Examination of Bids and Determination of Responsiveness

27.1 Prior to the detailed evaluation of Bids, the Employer shall determine whether each Bid
(a) meets the eligibility criteria defined in ITB Clause 4;
(b) has been properly signed;
(c) is accompanied by the required Bid Security in accordance with ITB Clause 17, if specified; and (d) is substantially responsive to the requirements of the Bidding Documents.

27.2 A substantially responsive Bid is one which conforms to all the terms, conditions & specifications of the Bidding Documents, without material deviation or reservation. A material deviation or reservation is one
(a) which affects in any substantial way the scope, quality or performance of the Works;
(b) which limits in any substantial way, inconsistent with the Bidding Documents, the Employer’s rights or the Bidder’s obligations under the Contract; or
(c) Whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

27.3 If a Bid is not substantially responsive, it shall be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.

28. Correction of Errors

28.1 Bids determined to be substantially responsive shall be checked by the Employer for any arithmetic errors. Errors shall be corrected by the Employer as follows:
(a) where there is a discrepancy between the amounts in figures and in words, the amount in words shall govern;
and
(b) Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted shall govern.

28.2 The amount stated in the Bid shall be adjusted by the Employer in accordance with the above procedure for the correction of errors and, with the concurrence of the Bidder, shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected amount, the Bid shall be rejected, and the Bid Security may be forfeited in accordance with ITB Sub-Clause 17.6 (b).

29. Currency for Bid Evaluation

The currency for bid evaluation shall be Indian Rupees only.

30. Evaluation and Comparison of Bids

30.1 The Employer shall evaluate and compare only the bids determined to be substantially responsive in accordance with ITB Clause 27.

30.2 In evaluating the bids, the Employer shall determine for each Bid the evaluated Bid price by adjusting the Bid price as follows:
(a) making any correction for errors pursuant to ITB Clause 28;
(b) making an appropriate adjustment for any other acceptable variations, deviations, and
(c) making appropriate adjustments to reflect discounts or other price modifications offered in accordance with ITB Sub-Clause 23.4.

30.3 The Employer reserves the right to accept or reject any variation, deviation, or alternative offer. Variations, deviations, and alternative offers and other factors which are in excess of the requirements of the Bidding Documents or otherwise result in unsolicited benefits for the Employer shall not be taken into account in Bid evaluation.

30.4 The estimated effect of any price adjustment conditions under GCC Clause 45, during the period of implementation of the Contract, shall not be taken into account in Bid evaluation.

30.5 Where bids are invited for several lots, the Employer shall determine the application of discounts so as to minimize the combined cost of all the lots, pursuant to ITB Sub-Clause 30.2 (c)

30.6 If the bid of the successful bidder, which results in the lowest Evaluated Bid Price, is seriously unbalanced, front loaded or substantially below updated estimates in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses (with breakdown of unit rates) for any or all items of the Bill of Quantities, to demonstrate the internal consistency and justification of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, taking into consideration the schedule of estimated contract payments, the Employer may require that the amount of the performance security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract

31. Preference for Domestic Bidders

Not used
### F. Award of Contract

<table>
<thead>
<tr>
<th>32. Award Criteria</th>
<th>Subject to ITB Clause 33, the Employer shall award the Contract to the Bidder whose Bid has been determined to be substantially responsive to the Bidding Documents and who has offered the lowest evaluated Bid price, provided that such Bidder has been determined to be (a) eligible in accordance with the provisions of ITB Clause 4, and (b) qualified in accordance with the provisions of ITB Clause 5.</th>
</tr>
</thead>
<tbody>
<tr>
<td>33. Employer’s Right to Accept any Bid and to Reject any or all Bids</td>
<td>Notwithstanding ITB Clause 32, the Employer reserves the right to accept or reject any Bid, and to cancel the bidding process and reject all bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Employer’s action.</td>
</tr>
<tr>
<td>34. Notification of Award and Signing of Agreement</td>
<td>34.1 The Bidder whose Bid has been accepted shall be notified of the award by the Employer prior to expiration of the Bid validity period in writing. This letter (hereinafter and in the GCC called the “Letter of Acceptance”) shall state the sum that the Employer shall pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the “Contract Price”).</td>
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<td></td>
<td>34.2 The Letter of Acceptance shall constitute the formation of the Contract, subject to the Bidder furnishing the Performance Security in accordance with ITB Clause 35 and signing the Agreement in accordance with ITB Sub-Clause 34.3.</td>
</tr>
<tr>
<td></td>
<td>34.3 The Agreement shall incorporate all agreements between the Employer and the successful Bidder. It shall be kept ready in the office of the Employer for the signature of the Employer and the successful Bidder, within 21 days following the Letter of Acceptance’s date. Within 21 days of receipt of letter of acceptance, the successful Bidder shall sign the Agreement and deliver it to the Employer along with performance security in accordance with ITB Clause 35.1 and revised construction methodology.</td>
</tr>
<tr>
<td></td>
<td>34.4 The Employer shall publish in a website <a href="http://www.gokulmilk.coop">www.gokulmilk.coop</a> the results identifying the bid and lot numbers and the following information: (i) name of each bidder who submitted a bid; (ii) bid prices as read out at bid opening; (iii) name and evaluated prices of each bid that was evaluated; (iv) name of bidders whose bids were rejected and the reasons for their rejection; and (v) name of the winning bidder, and the price it offered, as well as the duration and summary scope of the contract awarded. After publication of the award, unsuccessful bidders may request in writing to the Employer for a debriefing seeking explanations for the failure of their bids. The Employer shall promptly respond in writing to any unsuccessful Bidder who, after publication of contract award requests the Employer in writing to explain on which grounds its bid was not selected.</td>
</tr>
</tbody>
</table>
35. Performance Security

35.1 Within 21 days after receipt of the Letter of Acceptance, the successful Bidder shall sign the contract agreement and deliver to the Employer a Performance Security in the amount stipulated in the GCC and in the form (Bank Guarantee) stipulated in the BDS, in Indian Rupees.

35.2 If the Performance Security is provided by the successful Bidder in the form of a Bank Guarantee or cashier’s cheque/certified cheque/Bank Demand Draft, it shall be issued at the Bidder’s option, by a nationalized/scheduled bank located in India, or by a foreign bank acceptable to the Employer, through a correspondent bank located in India.

35.3 Failure of the successful Bidder to comply with the requirements of ITB Sub-Claususes 35.1 and 34.3 shall constitute sufficient grounds for cancellation of the award and forfeiture of the Bid Security and employers may resort to awarding the contract to the next lowest evaluated responsive bidder. Upon the successful Bidder’s, signing of the Agreement and furnishing of the Performance Security pursuant to ITB Clause 35.1, the Employer shall promptly notify the name of the winning bidder to each unsuccessful bidder and shall discharge the Bid Securities of the unsuccessful bidders pursuant to ITB Clause 17.5 of the unsuccessful bidders pursuant to ITB Clause 17.5.

36. Advance Payment and Security

36.1 The Employer shall provide an Advance Payment on the Contract Price as stipulated in the GCC, subject to a maximum amount, as stated in the BDS. The Advance Payment shall be guaranteed by a Security. Section X “Security Forms” provides a Bank Guarantee for Advance Payment form.

Section II. Bidding Data Sheet

A. General

ITB 1.1 The Employer is: Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur

ITB 1.1 The name of the work is: Civil work for Strawenrichment & Densification Plant at Mahalaxmi Cattlefeed Plant, Gad-Mudshingi, Tal – Karveer, Dist.-Kolhapur. For Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur.
The identification number of the work is: No-1 - Kolhapur.

ITB 1.2 The Intended Completion Date is mentioned in IFB

ITB 2.1 The Borrower is Government of India

ITB 2.1 The name of the work is: Civil work for Strawenrichment & Densification Plant at Mahalaxmi Cattlefeed Plant, Gad-Mudshingi, Tal – Karveer, Dist.-Kolhapur. For Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur.

ITB 4.4 The list of firms debarred from participating in World Bank projects is available at: http://www.worldbank.org/debar/.

ITB 5.3 The information required from bidders in ITB Sub-Clause 5.3 is modified as follows: none

ITB 5.3 (j) The ceiling for sub contractor’s participation is: NOT APPLICABLE FOR THIS WORK

ITB 5.5 The previous financial years are: 2010-11, 2011-12, 2012-2013, 2013-14, 2014-15
The qualification criteria in ITB Sub-Clause 5.5 are modified as follows:

**ITB 5.5 (A)**

(a) Financial turnover average: not less than Rs. 5.00 crore.
(b) Completion of one similar work of value of Rs. 2.50 crore. The following work will be considered as similar like Industrial Bldg.
(c) Execution of minimum quantities of major components of work in any one year. **Concrete work not less than 500 cu.mt.**
(d) The minimum amount of work executed for executing similar Electrical Works in any one year shall be...NOT APPLICABLE
(e) The minimum amount of work executed for executing similar Water Supply /Sanitary Works in any one year shall be NOT APPLICABLE

**ITB 5.5 (B)**

(a) The essential equipment to be made available for the Contract by the successful Bidder shall be as under: 1) **Concrete mix. m/c.** 2) weigh batcher 3) **Lift.** 4) vibrator. 5) **J.C.B. m/c.** 6) Dumpers 7) **Trucks** 8) **Tractor with trolly** 9) materials and concrete testing m/c. 10) **Shuttering – Plywood, M.S. plate farma** 11) **Acroback** 12) Scaffolding– wooden/ M.S. props. , Vibrators.and other required equipments.

Based on the studies carried out by the Employer, the minimum suggested major key and critical equipment required to attain the completion of work in accordance with the prescribed construction schedule are shown in the above list. The bidders should, however undertake their own studies and furnish with their bid, a detailed construction planning and methodology supported with layout and necessary drawings and detailed calculations as stated in clause 5.3 (k) above to allow the Employer to review their proposals. The numbers, types and capacities of each plant/ equipment shall be shown in the proposals along with the cycle time for each operation for the given production capacity to match the requirements.

(b) **The Key Personnel required from the bidder /contractor side for the project implementation are:**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Designation of personal</th>
<th>No</th>
<th>Minimum Qualification</th>
<th>Minimum years of experience</th>
<th>Minimum experience in similar works</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Site engineer (civil)</td>
<td>1</td>
<td>B.E. Civil</td>
<td>5 Years</td>
<td>2 Years</td>
</tr>
<tr>
<td>2</td>
<td>Supervisors</td>
<td>2</td>
<td>D.C.E.</td>
<td>5 Years</td>
<td>2 Years</td>
</tr>
<tr>
<td>3</td>
<td>Skilled workers &amp; Foreman</td>
<td>As per need</td>
<td>Certificate holder</td>
<td>3 Years</td>
<td>2 Years</td>
</tr>
<tr>
<td>4</td>
<td>Store keeper</td>
<td>1</td>
<td>Graduate</td>
<td>3 Years</td>
<td>2 Years</td>
</tr>
</tbody>
</table>

The persons of the following department(s) are not permitted to be in the employment of the Bidder.
(i) Client Organisation
(ii) N.D.D.B.
(iii) Centre /State/ local bodies
(c ) the minimum amount of liquid assets and/or credit facilities net of other contractual commitments of the successful Bidder [availability to be certified by a Scheduled Bank in the specified format] shall be Rs 30 lacs.

| ITB 5.7 | Annual increase factor N = 1 to be considered for bringing prices to the level of current financial year is 6% per annum. |

### B. Bidding Documents

| ITB 10.1 | For **clarification purposes only**, the Employer’s address is: Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur Gokul Project, B-1, M.I.D.C. Gokul Shirgaon, Kolhapur- 416234(MAH) |
| Attention: Contact person | Mr. Ghanekar (Managing Director) |
| Street Address | Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur |
| Floor/Room number | Gokul dairy |
| City | Kolhapur |
| Country | INDIA |
| Telephone: | Tel.: 0231-2672311 to 15, Fax: 0231-2672374 |
| Facsimile number | Fax: 0231-2672374 |
| Electronic mail address | md@gokulmilk.coop, civil@gokulmilk.coop |
| Web Page | www.gokulmilk.coop |

Requests for clarification should be received by the Employer no later than 14 **days prior to deadline for submission of bids**

| ITB 10.2 | Pre-bid Meeting shall be held : **NOT APPLICABLE** |
| Telephone | Tel.: 0231-2672311 to 15, Fax: 0231-2672374 |
| Facsimile number | Fax: 0231-2672374 |
| Electronic mail address | md@gokulmilk.coop, civil@gokulmilk.coop |

For **clarification purposes only**, the Employer’s address is Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur

### C. Preparation of Bids

<p>| ITB 13.1 | Any additional documents required to be completed and submitted by the Bidders are - NONE |
| ITB 14.5 | The Contract “is not” subject to price adjustment in accordance with GCC Clause 47. |
| ITB 16.1 | The Bid shall be valid for 90 days. |</p>
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITB 16.3</td>
<td>The factor ‘B’ is B= 6% Value, at the current price level, of existing commitments and on-going works</td>
</tr>
<tr>
<td>ITB 17.1</td>
<td>The Bid Security amount (EMD) is Rs. 5.00 Lacs</td>
</tr>
<tr>
<td>ITB 17.2</td>
<td>Bid Security should be in favour of “Kolhapur Zilla Sahakari Dudh Utpadak Sangh Ltd. Kolhapur” payable at Kolhapur. Types of acceptable securities are as under: 1. Demand draft/Bank Guarantee of any Nationalized Bank in favour of Kolhapur Zilla Sahakari Dudh Utpadak Sangh Ltd. Kolhapur payable at Kolhapur.</td>
</tr>
<tr>
<td>ITB 17.7</td>
<td>Deleted</td>
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<tr>
<td>ITB 19.1</td>
<td>The number of copies of the Bid to be completed and returned shall be two…</td>
</tr>
<tr>
<td>ITB 19.2</td>
<td>The written confirmation of authorization to sign on behalf of the Bidder shall indicate: a) Legally valid Power of Attorney is required to demonstrate the authority of the signatory to sign the Bid; and (b) In the case of Bids submitted by an existing or intended JV, if permitted as per ITB 5.4, the authorization shall be evidenced by a Power of Attorney signed by legally authorized signatories of all the partners.</td>
</tr>
</tbody>
</table>

**D. Submission of Bids**

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITB 20.1 (a)</td>
<td>Bidders submit their bids electronically - NO</td>
</tr>
</tbody>
</table>
| ITB 20.2 (a) | The Employer’s address for the purpose of Bid submission is  
Attention:… MANAGING DIRECTOR  
Address:… Kolhapur Zilla Sahakari Dudh Utpadak Sangh Ltd. Kolhapur B-1 M.I.D.C. Gokul Shirgaon, Kolhapur. 416234 (Maharashtra) |
| ITB 20.2 (b) | Name and identification number of the contract = as given in ITB 1.1 above in this sheet. |
| ITB 20.2 (c) | The warning should read “DO NOT OPEN BEFORE” Dt. 16/02/2016 at 3.30 P.M. |
| ITB 21.1 | The deadline for submission of bids shall be as mentioned in IFB; In the event the specified date is declared as a holiday for the employer, the bids will be received upto the appointed time on the next working day. |

**E. Bid Opening and Evaluation**

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
</table>
| ITB 24.1 | The bid opening shall take place at Kolhapur Zilla Sahakari Dudh Utpadak Sangh Ltd. Kolhapur  
Date: AS MENTIONED IN IFB  
In the event specified date is declared as a holiday for the employer, the bids will be received up to the appointed time on the next working day. |
| ITB 24.3 | The Letter of Bid and Priced Bill of Quantities shall be initialed by the representatives of the Employer conducting Bid opening: |

**Φ. Award of Contract**

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITB 35.1</td>
<td>The Standard Form of Performance Security acceptable to the Employer shall be – Bank Guarantee from any Nationalised Bank as per approved format.</td>
</tr>
<tr>
<td>ITB 36.1</td>
<td>The Advance Payment shall be limited to 5% percent of the Contract Price. Please see PCC Clause 49.1 for conditions.</td>
</tr>
<tr>
<td>ITB 37.1</td>
<td></td>
</tr>
</tbody>
</table>

27
Section III. Eligible Countries

Eligibility for the Provision of Goods, Works and Services in Bank-Financed Procurement

1. In reference to ITB 4.7, for the information of the Bidders, at the present time firms, goods and services from the following countries are excluded from this bidding process:

   Under ITB 4.7 (a)  [insert a list of the countries following approval by the Bank to apply the restriction or state] “none”

   Under ITB 4.7 (b)  [insert a list of the countries following approval by the Bank to apply the restriction or state] “none”
Section IV. Forms of Letter of Bid, Qualification Information, Letter of Acceptance, and Agreement

Letter of Bid

The Bidder must prepare the Letter of Bid on stationery with its letterhead clearly showing the Bidder’s complete name and address. If the Bidder objects to the Dispute Review expert proposed by the Employer in the Bidding Documents, it should so state in its Bid, and present an alternative candidate, together with the candidate’s daily fees and biographical data, in accordance with ITB Clause 37. Bidder should also confirm requirement of advance if provided in ITB36.1.

Note: All italicized text is for use in preparing these forms and shall be deleted from the final products.

Date: ______________

Invitation for Bid No.: 1-Kolhapur

(d) To: Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur

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 11);
(b) We meet the eligibility requirements and have no conflict of interest in accordance with ITB 4;
(c) We have not been suspended nor declared ineligible by the Employer in accordance with ITB 4.7 & ITB 5.8
(d) We offer to execute in conformity with the Bidding Documents the following Works:- Civil work for Strawenrichment & Densification Plant at Mahalaxmi Cattlefeed Plant, Gad-Mudshingi, Tal – Karveer, Dist.- Kolhapur.

For
Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur.

(e) The total price of our Bid, excluding any discounts offered in item (d) below is: __________________ [both in words and figures]
   - In case of only one lot, total price of the Bid [insert the total price of the bid in words and figures];
   - In case of multiple lots, total price of each lot [insert the total price of each lot in words and figures];
- In case of multiple lots, total price of all lots (sum of all lots) [insert the total price of all lots in words and figures.]:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(f)</td>
<td>The discounts offered and the methodology for their application are:</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>(g)</td>
<td>Our bid shall be valid for a period of 90 DAYS days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain a binding upon us and may be accepted at any time before the expiration of that period:</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(h)</td>
<td>We accept the appointment of as the Dispute Review Expert [or]</td>
</tr>
<tr>
<td></td>
<td>We do not accept the appointment of [insert name proposed in Bid Data Sheet] as the Dispute Review Expert, and propose instead that [insert name] be appointed as Dispute Review Expert, whose daily fees and biographical data are attached.</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>We require advance payment equal to 5% percent of the Contract Price .................as provided in ITB clause 36.1.</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(k)</td>
<td>We are not participating, as a Bidder, in more than one bid in this bidding process in accordance with ITB 6.1.</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(l)</td>
<td>Our firm, its affiliates or subsidiaries, including any Subcontractors or Suppliers for any part of the contract, has not been declared ineligible by the Bank, under the Employer’s country laws or official regulations or by an act of compliance with a decision of the United Nations Security Council;</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(m)</td>
<td>We are not a government owned entity / We are a government owned entity but meet the requirements of ITB 4.5:</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(n)</td>
<td>We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract:</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(o)</td>
<td>We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery or any collusive arrangements with competitors.</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(p)</td>
<td>We also undertake that, in competing for (and, if the award is made to us, in executing) the above contract, we will strictly observe the laws against fraud and corruption in force in India on date namely “Prevention of Corruption Act 1988.”</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(q)</td>
<td>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;</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(r)</td>
<td>We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive; and</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(s)</td>
<td>If awarded the contract, the person named below shall act as Contractor’s Representative: ________________________________________________________</td>
</tr>
</tbody>
</table>

Name of the Bidder* [insert complete name of person signing the Bid]
Use one of the two options as appropriate.

If none has been paid or is to be paid, indicate "none"

Bidder**: [insert complete name of person duly authorized to sign the Bid]

Title of the person signing the Bid: [insert complete title of the person signing the Bid]

Signature of the person named above: [insert signature of person whose name and capacity are shown above]

Date signed: [insert date of signing] day of [insert month], [insert year]

*: In the case of the Bid submitted by joint venture specify the name of the Joint Venture as Bidder

**: Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid Schedules.
2. Qualification Information

Notes on Form of Qualification Information

The information is to be filled in by individual bidders and by each member of Joint Venture in case of JV participating in the Bid. The following pages will be used for purposes of post-qualification as provided for in Clause 5 of the Instructions to Bidders. This information will not be incorporated in the Contract. Attach additional pages as necessary.

Individual Bidders Qualification

1. (i) Constitution or legal status of Bidder [attach copy]

(ii) Place of registration: [attach copy]

(iii) Principal place of business: [attach copy]

(iv) Power of attorney of signatory of Bid

Total annual volume of civil engineering construction work executed and payments received in the last five years preceding the year in which bids are invited. (Attach certificate from Chartered Accountant) Year (Rs. In millions) 20 - 20

(A) Work performed as prime Contractor (in the same name & style) on construction works of a similar nature and volume over the last five years preceding the year in which bids are invited. [Attach certificate from the Engineer-in-charge.]

<table>
<thead>
<tr>
<th>Project name</th>
<th>Name of Employer</th>
<th>Description of work</th>
<th>Contract no.</th>
<th>Value of contract</th>
<th>Date of issue of work order</th>
<th>Stipulated date of completion</th>
<th>Actual date of completion</th>
<th>Remarks explaining reasons for delay if any</th>
</tr>
</thead>
</table>

(B) Quantities of work executed as prime contractor (in the same name and style) in the last five years:

<table>
<thead>
<tr>
<th>Year</th>
<th>Name of work</th>
<th>Name of employer</th>
<th>Quantity of work performed (cum) @</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cement concrete (including RCC &amp; PCC)</td>
</tr>
</tbody>
</table>

[@ The items or work for which date is requested should tally with that specified in ITB 5.5A(c) * Attach certificates from Engineer in-charge]
(c) Value of Electrical & Sanitary/ Water supply works executed (ITB Clause 5.5 (A) (d) & (e))

<table>
<thead>
<tr>
<th>Name of contract or</th>
<th>Year</th>
<th>Contract no.</th>
<th>Name of work</th>
<th>Name of employer &amp; address</th>
<th>Value of electrical works executed</th>
<th>Value of sanitary water supply works executed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Immediately proceeding the financial year in which bids are received.

2.1. **Information on Bid Capacity** (works for which bids have been submitted and works which are yet to be completed) as on the date of bid submission.

(A) **Existing commitments and on-going construction works:**

<table>
<thead>
<tr>
<th>Description of works</th>
<th>Place &amp; state</th>
<th>Contract no. &amp; date</th>
<th>Name of employer &amp; address</th>
<th>Value of contract (RS. In million)</th>
<th>Stipulated date of completion</th>
<th>Value of works remaining to be completed (RS. In million)</th>
<th>Anticipated date of completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Enclose certificate(s) from Engineers(s)-in-charge for value of work remaining to be completed.

(B) **Works for which bids already submitted & likely to be awarded – expected additional commitment.**

<table>
<thead>
<tr>
<th>Description of works</th>
<th>Place &amp; state</th>
<th>Name of employer &amp; address</th>
<th>Estimated Value of works (RS. In million)</th>
<th>Stipulated date of completion</th>
<th>Date when decision is excepted</th>
<th>Remarks if any</th>
<th>Experience in similar work</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.2 **Availability of Major items of Contractor’s Equipment:** List all information requested below.

Refer also to Clause 5.3 (d) and Clause 5.5B (a) of the Instructions to Bidders.

<table>
<thead>
<tr>
<th>Item of Equipment</th>
<th>Description</th>
<th>Make</th>
<th>Capacity</th>
<th>Age (years)</th>
<th>Condition</th>
<th>Number available</th>
<th>Owned</th>
<th>Leads</th>
<th>Purchased</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.3 **Qualifications of technical personnel proposed:** Refer also to Clause 5.3 (e) and Clause 5.5 (b) of the Instructions to Bidders and Clause 9.1 of Part-1 General Conditions of Contract.

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Qualification</th>
<th>Years of experience</th>
<th>Years of experience in proposed position (modify the items to suit the work)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Road works</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

2.4 **Proposed sub-contractors and firms:** Refer to ITB Clause 5.3(j) and GCC Clause 7.

<table>
<thead>
<tr>
<th>Sections of the works</th>
<th>Value of subcontract</th>
<th>% of bid price</th>
<th>Sub-contractor (name &amp; address)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Note: The capability of the sub-contractor will also be assessed (on the same lines as for the main contractor) before according approval to him.

2.5 **Financial reports or the last five years:** Balance sheets, profit and loss statements, auditors’ reports, etc. List below and attach copies.

2.6 **Financial Resources:** Evidence of access to financial resources to meet the qualification requirements ([cash in hand, lines of credit, etc.]) List below and attach copies of support documents. [Attach a certificate from Bank in the format at the end of this section. Other. Certificate, will not be accepted]

2.7 **Banker's References:** Name, address, and telephone, telex, and facsimile numbers of banks that may provide references if contacted by the Employe
2.8 **Information on current litigation in which the Bidder is involved.**

<table>
<thead>
<tr>
<th>Name of other party(s)</th>
<th>Cause of dispute</th>
<th>Litigation where (court or arbitration)</th>
<th>Amount involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

2.9 **Proposed work method and schedule:** The bidder should attach descriptions, drawings and charts as necessary, to comply with the requirements of the bidding documents. [Refer Clause 5.1 and 5.3(k)]

2.10 **Statement of Compliance under the requirements of Sub-Clause 4.2 of ITB.**

2.11 **Financial Statements Summary:** To be submitted by each bidder including each members of JV

**SUMMARY OF FINANCIAL STATEMENTS**

<table>
<thead>
<tr>
<th>Name of bidder/JV Member:</th>
<th>(Equivalent Rs. Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.No.</td>
<td>Financial Information in Rupee equivalent with exchange rate at the end of concerned year</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>Total Assets</td>
</tr>
<tr>
<td>2</td>
<td>Total Turnover</td>
</tr>
<tr>
<td>3</td>
<td>Current Assets</td>
</tr>
<tr>
<td>4</td>
<td>Current Assets + Loan &amp; Advances</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------------------------------</td>
</tr>
<tr>
<td>5</td>
<td>Total Liabilities</td>
</tr>
<tr>
<td>6</td>
<td>Current Liabilities</td>
</tr>
<tr>
<td>7</td>
<td>Current Liabilities &amp; provision</td>
</tr>
<tr>
<td>8</td>
<td>Profit before Interest and</td>
</tr>
<tr>
<td>9</td>
<td>Tax Profit before Tax</td>
</tr>
<tr>
<td>10</td>
<td>Profit after Tax</td>
</tr>
<tr>
<td>11</td>
<td>Share holder’s funds (net worth) = (paid up equity + reserves) -</td>
</tr>
<tr>
<td>12</td>
<td>(revaluation Worth) = (Paid up equity + Reserves) - (revaluation reserves + Miscellaneous expenditure not written off)</td>
</tr>
<tr>
<td>13</td>
<td>Current Ratio (2)/(5)</td>
</tr>
<tr>
<td>14</td>
<td>Net cash accruals</td>
</tr>
<tr>
<td>15</td>
<td>Profit after Tax + depreciation</td>
</tr>
</tbody>
</table>

This information should be extracted from the Annual Financial Statements/Balance sheets, which should be enclosed. Year 1 will be the latest year for which audited financial statements are available. Year 2 shall be the year immediately preceding year 1 and year 3 shall be the year immediately preceding Year 2.

**2.12 Additional Requirements**: Bidders should provide any additional information required to fulfill the requirements of clause 5 of ITB.
This is to certify that M/s……………………………is a reputed company with a good financial standing.

If the contract for the work, namely…………………………………..[funded by the World Bank] is awarded to the above firm, we shall be able to provide overdraft/credit facilities to the extent of Rs. ……….. to meet their working capital requirements for executing the above contract. --Sd.--

Name of Bank

Senior Bank Manager

Address of the Bank

* Change the text as follows for Joint Venture:

This is to certify that M/s. ………………. Who has formed a JV with M/s. …………….. and M/s. ………………… for participating in this bid, is a reputed company with a good financial standing.

If the contract for the work, namely …………………………… [ funded by the World Bank] is awarded to the above Joint Venture, we shall be able to provide overdraft/credit facilities to the extent of Rs. ……….. to M/s. …………….. to meet the working capital requirements for executing the above contract.

[This should be given by the JV members in proportion to their financial participation.]

(To be given from a nationalized or scheduled bank in India. No other substitute will be acceptable)
Civil work for Straw enrichment & Densification Plant at Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur

(Name of the Project)

(Declaration regarding customs/ excise duty exemption for materials/ Construction equipment bought for the work )

(Bidder’s Name and Address)

To: Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur

Dear Sir:

Re: Civil work for Straw enrichment & Densification Plant at Mudshingi, Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur Certificate for Import/Procurement of Goods/Construction Equipment

1. We confirm that we are solely responsible for obtaining customs/excise duty waivers which we have considered in our bid and in case of failure to receive such waivers for reasons whatsoever, the employer will not compensate us.

2. We are furnishing below the information required by the Employer for issue of the necessary certificates in terms of the Government of India Central Excise Notification No.108/95 and Customs Notification No. 85/99

3. The goods/construction equipment for which certificates are required are as under:

<table>
<thead>
<tr>
<th>Items (modify the list as required for the work)</th>
<th>Make / brand name</th>
<th>Capacity (where applicable)</th>
<th>Quantity</th>
<th>Value</th>
<th>State whether it will be procured locally or imported (if so from which country)</th>
<th>Remarks regarding justification for the quantity and their usage in works</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Bitumen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Cement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) Steel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. We agree that no modification to the above list is permitted after bids are opened.

5. We agree that the certificate will be issued only to the extent considered reasonable by the Employer for the work, based on the Bill of Quantities and the construction programme and methodology as furnished by us along with the bid.

6. We confirm that the above goods and construction equipment will be exclusively used for the construction of the above work and the construction equipment will not be sold or otherwise disposed of in any manner for a period of five years from the date of acquisition.

Date: __________________

( Signature)____________________

Place: ___________________ ( Printed 
Name)____________________

( Designation)____________________

( Common Seal) ___________________

[This certificate will be issued within 60 days of signing of contract and no subsequent changes will be permitted.]
3. Letter of Acceptance

[Letterhead paper of the Employer]

[The Letter of Acceptance shall be the basis for formation of the Contract as described in ITB Clauses 34 and 35. This Standard Form of Letter of Acceptance shall be filled in and sent to the successful Bidder only after evaluation of bids has been completed, subject to any review by the World Bank required under the Loan Agreement.]

[Insert date]

Identification No and Title of Contract: NO.-1 Civil work for Straw enrichment & Densification Plant at Mudshingi, Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur

[Insert identification number and title of the Contract]

To: [insert name and address of the Contractor]

This is to notify you that your Bid dated [insert date] for execution of the NO.-1 Civil work for Straw enrichment & Densification Plant at Mudshingi, Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur for the Contract Price [Insert amount in numbers and words] as corrected and modified\(^5\) in accordance with the Instructions to Bidders is hereby accepted by our Agency.

[Insert one of the following (a) or (b) options]

(a) We accept that [insert name proposed by bidder] be appointed as the Dispute review expert.

1.1 (b) we do not accept that [insert name proposed by bidder] be appointed as Dispute Review expert, and by sending a copy of this Letter of Acceptance to [insert name of the Appointing Authority], we are hereby requesting [insert name], the Appointing Authority, to appoint the dispute Review Expert in accordance with ITB Clause 37.1.\(^7\)

we note that as per your bid, you do not intend to subcontract any component of work OR We note that as per your bid, you propose to employ M/s. ...................... as subcontractor for executing ............

[Delete whatever is inapplicable]

\(^5\) Delete “corrected and” or “and modified” if not applicable. See Notes on Standard Form of Agreement, next page.

\(^6\) To be used only if the Contractor disagrees in the Bid with the Adjudicator proposed by the Employer in the Instructions to Bidders, and has accordingly offered another candidate.

\(^7\) To be used only if the Contractor disagrees in the Bid with the Adjudicator proposed by the Employer in the ITB, has accordingly offered another candidate, and the Employer does not accept the counterproposal.
You are hereby requested to furnish Performance Security, plus additional security for unbalanced bids in terms of ITB clause 30.6, in the form detailed in ITB Clause 35.1 for an amount of Rs. ____ within 21 days of the receipt of this letter of acceptance, valid upto 28 days from the date of expiry of Defects Liability Period i.e. upto .................. and sign the contract, failing which action as stated in ITB Clause 35.3 will be taken.

We have reviewed the construction methodology submitted by you along with the bid in response to ITB Clause 5.3[k] and our comments are given in the attachment. You are requested to submit a revised Program including environmental management plan as per Clause 26 of General Conditions of Contract within 14 days of receipt of this letter of acceptance.

Yours faithfully,

Authorized Signature.................................

Name and Title of signatory ......................

Name of Agency...........................................
Issue of Notice to proceed with the work

(Letterhead of the Employer)

_________ (date)

To
______________________________ (name and address of the Contractor)

Dear Sirs:

Pursuant to your furnishing the requisite security as stipulated in ITB clause 35.1, insurance policy as per GCC ______, construction methodology as stated in letter of acceptance and signing of the contract agreement for the construction of__________@ a Bid Price of Rs.________, you are hereby instructed to proceed with the execution of the said works in accordance with the contract documents.

Yours faithfully,

(Signature, name and title of signatory authorized to sign on behalf of Employer)
4. Agreement

[The Agreement shall incorporate any corrections or modifications to the Bid resulting from corrections of errors (ITB Clause 28), price adjustment during the evaluation process (ITB Sub-Clause 16.3), selection of an alternative offer (ITB Clause 18), acceptable deviations (ITB Clause 27), or any other mutually-agreeable changes allowed for in the Conditions of Contract, such as changes in key personnel, subcontractors, scheduling, and the like.]

This Agreement, made the Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur [insert day] day of [insert month], [insert year] between [insert name and address of Employer] (hereinafter called “the Employer”) and [insert name and address of Contractor] (hereinafter called “the Contractor”) of the other part.

Whereas the Employer is desirous that the Contractor execute [insert name and identification number of Contract] (hereinafter called “the Works”) and the Employer has accepted the Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein at a contract price of Rs. ............... Now this Agreement witnessed as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to, and they shall be deemed to form and be read and construed as part of this Agreement.

2. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.

3. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects wherein 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 thereto have caused this Agreement to be executed the day and year first before written.

The Common Seal of [Witness entity] was hereunto affixed in the presence of:
Signed, Sealed, and Delivered by the said in the presence of:

Binding Signature of Employer of an authorized representative of the Employer]

Binding Signature of Contractor of an authorized representative of the Contractor]

[signature]

[signature]
**Section V. Bank Policy - Corrupt and Fraudulent Practices**

Guidelines for Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers, dated January 2011:

"Fraud and Corruption:

1.16  It is the Bank’s policy to require that Borrowers (including beneficiaries of Bank loans), bidders, suppliers, contractors and their agents (whether declared or not), sub-contractors, sub-consultants, service providers or suppliers, and any personnel thereof, observe the highest standard of ethics during the procurement and execution of Bank-financed contracts. In pursuance of this policy, the Bank:

<table>
<thead>
<tr>
<th>(a)</th>
<th>defines, for the purposes of this provision, the terms set forth below as follows:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>“corrupt practice” is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;</td>
</tr>
<tr>
<td>(ii)</td>
<td>“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;</td>
</tr>
<tr>
<td>(iii)</td>
<td>“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;</td>
</tr>
<tr>
<td>(iv)</td>
<td>“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;</td>
</tr>
<tr>
<td>(v)</td>
<td>(a) “obstructive practice” is</td>
</tr>
<tr>
<td></td>
<td>(aa) deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a 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</td>
</tr>
<tr>
<td></td>
<td>(bb) acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under paragraph 1.16(e) below.</td>
</tr>
<tr>
<td></td>
<td>(b) will reject a proposal for award if it determines that the bidder recommended for award or any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;</td>
</tr>
<tr>
<td></td>
<td>(c) will declare mis procurement and cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Borrower or of a recipient of any part of the proceeds of the loan engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices during the procurement</td>
</tr>
</tbody>
</table>
or the implementation of the contract in question, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur, including by failing to inform the Bank in a timely manner at the time they knew of the practices;

(d) will sanction a firm or individual, at any time, in accordance with the prevailing Bank’s sanctions procedures, including by publicly declaring such firm or individual ineligible, either indefinitely or for a stated period of time: (i) to be awarded a Bank-financed contract; and (ii) to be a nominated sub-contractor, consultant, manufacturer or supplier, or service provider;

(e) will require that a clause be included in bidding documents and in contracts financed by a Bank loan, requiring bidders, suppliers and contractors, and their sub-contractors, agents, personnel, consultants, service providers, or suppliers, to permit the Bank to inspect all accounts, records, and other documents relating to the submission of bids and contract performance, and to have them audited by auditors appointed by the Bank.”

8 In this context, any action to influence the procurement process or contract execution for undue advantage is improper.

9 For the purpose of this sub-paragraph, “another party” refers to a public official acting in relation to the procurement process or contract execution. In this context, “public official” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

10 For the purpose of this sub-paragraph, “party” refers to a public official; the terms “benefit” and “obligation” relate to the procurement process or contract execution; and the “act or omission” is intended to influence the procurement process or contract execution.

11 For the purpose of this sub-paragraph, “parties” refers to participants in the procurement process (including public officials) attempting either themselves, or through another person or entity not participating in the procurement or selection process, to simulate competition or to establish bid prices at artificial, non-competitive levels, or are privy to each other’s bid prices or other conditions.

12 For the purpose of this sub-paragraph, “party” refers to a participant in the procurement process or contract execution.

13 A firm or individual may be declared ineligible to be awarded a Bank financed contract upon: (i) completion of the Bank’s sanctions proceedings as per its sanctions procedures, including, inter alia, cross-debarment as agreed with other International Financial Institutions, including Multilateral Development Banks, and through the application the World Bank Group corporate administrative procurement sanctions procedures for fraud and corruption; and (ii) as a result of temporary suspension or early temporary suspension in connection with an ongoing sanctions proceeding. See footnote 14 and paragraph 8 of Appendix 1 of these Guidelines.

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

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### General Conditions of Contract

#### A. General

1. **Definitions**

1.1 Boldface type is used to identify defined terms.

<table>
<thead>
<tr>
<th>Definition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>The Accepted Contract Amount means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.</td>
</tr>
<tr>
<td>(b)</td>
<td>Not used.</td>
</tr>
<tr>
<td>(c)</td>
<td>The Dispute Review Expert is the person appointed jointly by the Employer &amp; the Contractor to resolve disputes in the first instance, as provided for in GCC 23.</td>
</tr>
<tr>
<td>(d)</td>
<td>Bank means the financing institution named in the PCC.</td>
</tr>
<tr>
<td>(e)</td>
<td>Bill of Quantities means the priced and completed Bill of Quantities forming part of the Bid.</td>
</tr>
<tr>
<td>(f)</td>
<td>Compensation Events are those defined in GCC Clause 42 hereunder.</td>
</tr>
<tr>
<td>(g)</td>
<td>The Completion Date is the date of completion of the Works as certified by the Project Manager, in accordance with GCC Sub-Clause 53.1.</td>
</tr>
<tr>
<td>(h)</td>
<td>The Contract is the Contract between the Employer and the Contractor to execute, complete &amp; maintain the Works. It consists of the documents listed in GCC Sub-Clause 2.3 below.</td>
</tr>
<tr>
<td>(i)</td>
<td>The Contractor is the party whose Bid to carry out the Works has been accepted by the Employer.</td>
</tr>
<tr>
<td>(j)</td>
<td>The Contractor’s Bid is the completed bidding document submitted by the Contractor to the Employer.</td>
</tr>
<tr>
<td>(k)</td>
<td>The Contract Price is the Accepted Contract Amount stated in the Letter of Acceptance and thereafter as adjusted in accordance with the Contract.</td>
</tr>
<tr>
<td>(l)</td>
<td>Days are calendar days; months are calendar months.</td>
</tr>
<tr>
<td>(m)</td>
<td>Not used.</td>
</tr>
<tr>
<td>(n)</td>
<td>Defect is any part of the Works not completed in accordance with the Contract.</td>
</tr>
<tr>
<td>(o)</td>
<td>The Defects Liability Certificate is the certificate issued by Project Manager upon correction of defects by the Contractor.</td>
</tr>
<tr>
<td>(p)</td>
<td>The Defects Liability Period is the period named in the PCC pursuant to Sub-Clause 34.3 and calculated from the Completion Date.</td>
</tr>
<tr>
<td>(q)</td>
<td>Drawings means the drawings of the Works, as included in the Contract, and any additional &amp; modified drawings issued by (or on behalf of) the Employer in accordance with the Contract, include calculations and other information provided or approved by the Project Manager for the execution of the Contract.</td>
</tr>
<tr>
<td>(r)</td>
<td>The Employer is the party who employs the Contractor to carry out the Works, as specified in the PCC.</td>
</tr>
</tbody>
</table>
(s) Equipment is the Contractor’s machinery and vehicles brought temporarily to the Site to construct the Works.

(t) “In writing” or “written” means hand-written, type-written, printed or electronically made & resulting in a permanent record;


(v) The Intended Completion Date is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is specified in the PCC. The Intended Completion Date may be revised only by the Project Manager by issuing an extension of time or an acceleration order.

(w) Materials are all supplies, including consumables, used by the Contractor for incorporation in the Works.

(x) Plant is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.

(y) The Project Manager is the person named in the PCC (or any other competent person appointed by the Employer & notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.

(z) PCC means Particular Conditions of Contract

(aa) The Site is the area defined as such in the PCC.

(bb) Site Investigation Reports are those that were included in the bidding documents & are factual and interpretative reports about the surface and subsurface conditions at the Site.

(cc) Specification means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager.

(dd) The Start Date is given in the PCC. It is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.

(ee) Subcontractor is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.

(ff) Temporary Works are works designed, constructed, installed & removed by the Contractor that are needed for construction or installation of the Works.

( gg) Variation is an instruction given by the Project Manager which varies the Works.

(hh) The Works are what the Contract requires the Contractor to construct, install, and turn over to the Employer, as defined in the PCC.
2. Interpretation

2.1 In interpreting these GCC, words indicating one gender include all genders. Words indicating the singular also include the plural and words indicating the plural also include the singular. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Project Manager shall provide instructions clarifying queries about these GCC.

2.2 If sectional completion is specified in the PCC, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).

2.3 The documents forming the Contract shall be interpreted in the following order of priority:

(a) Agreement,
(b) Letter of Acceptance,
(c) Contractor’s Bid & Priced Bill of Quantities,
(d) Particular Conditions of Contract,
(e) General Conditions of Contract,
(f) Specifications,
(g) Drawings, and
(h) Joint Venture Agreement [where applicable]

(i) Any other document listed in the PCC as forming part of the Contract.

3. Language and Law

3.1 The language of the Contract and the law governing the Contract are stated in the PCC. Salient features of major labour and other laws that are applicable to construction industry in India are given as Appendix 1 to these General Conditions of Contract.

3.2 Throughout the execution of the Contract, the Contractor shall comply with the import of goods and services prohibitions in the India when

(a) as a matter of law or official regulations, India prohibits commercial relations with that country; or

(b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, India prohibits any import of goods from that country or any payments to any country, person, or entity in that country.

4. Project Manager’s

4.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Employer and the Contractor in the role representing the Employer. However, if the Project Manager is required,
<table>
<thead>
<tr>
<th>Decisions</th>
<th>Decisions under the rules &amp; regulations and orders of the Employer, to obtain approval of some other authorities for specific actions, he will so obtain the approval. Provided further that any requisite approval shall be deemed to have been given by the Employer for any such authority exercised by the Project Manager. Unless otherwise specified in the PCC, the Project Manager may delegate any of his duties and responsibilities to other people, except to the, after notifying the Contractor, and may revoke any delegation after notifying the Contractor.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Delegation</td>
<td></td>
</tr>
<tr>
<td>6. Delegation</td>
<td>6.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered. All oral instructions shall be confirmed in writing in seven working days.</td>
</tr>
<tr>
<td>7. Subcontracting</td>
<td>7.1 The Contractor may subcontract with the approval of the Project Manager up to a ceiling specified in PCC, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor’s obligations.</td>
</tr>
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<td></td>
<td>7.2 The Project Manager should satisfy himself before recommending to the Employer whether:</td>
</tr>
<tr>
<td></td>
<td>a. the circumstances warrant such sub-contracting; and,</td>
</tr>
<tr>
<td></td>
<td>b. the sub-Contractor so proposed for the Work possesses the experience, qualifications and equipment necessary for the job proposed to be entrusted to him in proportion to the quantum of Works to be subcontracted.</td>
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<tr>
<td></td>
<td>7.3 If payments are proposed to be made directly to that sub-contractor, this should be subject to specific authorization by the prime contractor so that his arrangement does not alter the contractor’s liability or obligations under the contract.</td>
</tr>
<tr>
<td></td>
<td>7.4 The Contractor shall not be required to obtain any consent from the Employer for:</td>
</tr>
<tr>
<td></td>
<td>(a) the sub-contracting of any part of the Works for which the Sub-Contractor is already named in the contract;</td>
</tr>
<tr>
<td></td>
<td>(b) the provision for labour, or labour component, and,</td>
</tr>
<tr>
<td></td>
<td>(c) the purchase of materials which are in accordance with the standards specified in the contract.</td>
</tr>
</tbody>
</table>
(Note: 1. All bidders are expected to indicate clearly in the bid, if they proposed sub-contracting elements of the works amounting to more than 10 percent of the Bid Price. For each such proposal the qualification and the experience of the identified sub-contractor in the relevant field should be furnished along with the bid to enable the employer to satisfy himself about their qualifications before agreeing for such sub-contracting and include it in the contract. In view of the above, normally no additional sub-contracting should arise during execution of the contract.

2. However, [a] sub-contracting for certain specialized elements of the work is not unusual and acceptable for carrying out the works more effectively; but vertical splitting of the works for sub-contracting is not acceptable. [b] In any case, proposal for sub-contracting in addition to what was specified in bid and stated in contract agreement will not be acceptable if the value of such additional sub-contracting exceeds 25% of value of work which was to be executed by 

Contractor without sub-contracting.

3. Assignment of the contract may be acceptable only under exceptional circumstances such as insolvencies/liquidation or merger of companies etc.)

8. Other Contractors

8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities & the Employer between the dates given in the Schedule of Other Contractors, as referred to in the PCC. The Contractor shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.

9. Personnel and Equipment

9.1 The Contractor shall employ the key personnel and use the equipment identified in its Bid and referred to in the PCC, to carry out the Works or other personnel & equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.

9.2 The Project Manager may require the Contractor to remove from the Site of Works, a member of the Contractor’s staff or his work force, 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.

9.3 If the Employer, Project Manager or Contractor determines, that any employee of the Contractor be determined to have engaged in corrupt, fraudulent, collusive, coercive, or obstructive practice during the execution of
the Works, then that employee shall be removed in accordance with Clause 9.2 above.

9.4 In all the above cases, the contractor shall ensure that the person leaves the site within seven days and has no further connection with the work in the contract. The Contractor shall appoint a suitable replacement within 28 days or earlier as may be agreed to between the Project Manager and the Contractor.

9.5 The Contractor shall not employ any retired Gazetted officer who has either not completed two years after the date of retirement or has not obtained permission from the Government authorities for employment with the Contractor.

9.6 The Contractor shall, unless otherwise provided in the Contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport. The Contractor shall, if required by the Project Manager, deliver to the Project Manager a return in detail, in such form and at such intervals as the Project Manager may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such other information as the Project Manager may require.

9.7 During continuance of the Contract, the Contractor and his Sub-Contractors shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and bye laws of the State or Central Government or local authority and any other labour laws (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law prevailing on the Base Date either by the State or the Central Government or the local authority. The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contraventions including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications /bye laws/ Acts/ Rules/ regulations including amendments, if any, on the part of the Contractor, the Project Manager/ Employer shall have the right to deduct any money due to the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

9.8 The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Employer at any point of time.

9.9 The Contractor shall duly comply with the provisions of the Apprentices Act 1961 (III of 1961) and the rules made there under, and comply, failure or neglect to shall be subject to all liabilities and penalties provided in the said Act and Rules.

11. Employer's

| Compliance with Labour Regulations | 9.7 During continuance of the Contract, the Contractor and his Sub-Contractors shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and bye laws of the State or Central Government or local authority and any other labour laws (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law prevailing on the Base Date either by the State or the Central Government or the local authority. The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contraventions including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications /bye laws/ Acts/ Rules/ regulations including amendments, if any, on the part of the Contractor, the Project Manager/ Employer shall have the right to deduct any money due to the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer. |
| 9.8 The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Employer at any point of time. |
| 9.9 The Contractor shall duly comply with the provisions of the Apprentices Act 1961 (III of 1961) and the rules made there under, and comply, failure or neglect to shall be subject to all liabilities and penalties provided in the said Act and Rules. |
risks, & the Contractor carries the risks which this Contract states are Contractor’s risks.

| 12. Contractor’s Risks | 12.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Employer’s risks:  
(a) The risk of personal injury, death or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to  
   (i) use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works or  
   (ii) Negligence, breach of statutory duty, or interference with any legal right by the Employer or by any person employed by or contracted to him except the Contractor.  
b) The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Employer or in the Employer’s design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.  
(b) From the Completion Date until the Defects Liability Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is an Employer’s risk except loss or damage due to  
   (a) a Defect which existed on the Completion Date,  
   (b) an event occurring before the Completion Date, which was not itself an Employer’s risk, or  
   (c) the activities of the Contractor on the Site after the Completion Date.  
12.3 From the Starting Date until the Defects Liability Certificate has been issued, the risks of personal injury, death, and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Employer’s risks are Contractor’s risks.  
13. Insurance | 13.1 The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles stated in the PCC for the following events which are due to the Contractor’s risks:  
(a) loss of or damage to the Works, Plant, and Materials [which are incorporated in works];  
(b) loss of or damage to Construction Equipment;  
(c) loss of or damage to property (except the Works, Plant, Materials & Equipment) in connection with the Contract; and  
(d) personal injury or death.  
13.2 Policies and certificates for insurance shall be delivered by the
Contractor to the Project Manager for the Project Manager’s approval before the Start Date. All such insurance shall provide for compensation to be payable in the types & proportions of currencies required to rectify the loss or damage incurred.

13.3 If the Contractor does not provide any of the policies and certificates required, the Employer may affect the insurance which the Contractor should have provided and recover the premiums the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

13.4 Alterations to the terms of insurance shall not be made without the approval of the Project Manager. 13.5 Both parties shall comply with any conditions of the insurance policies.

<table>
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<tr>
<th>14. Site Data</th>
<th>14.1 The Contractor shall be deemed to have examined any Site Data referred to in the PCC, supplemented by any information available to the Contractor.</th>
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<tr>
<th>15. Contractor to Construct the Works</th>
<th>15.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings and as per instructions of Project Manager.</th>
</tr>
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<tr>
<th>Protection of Environment</th>
<th>15.2.1 The Contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other cause arising as a consequence of his methods of operation.</th>
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<tr>
<th>Protection of Environment</th>
<th>15.2.2 During continuance of the contract, the contractor and his sub-contractors shall abide at all times by all existing enactments on environmental protection and rules made there under, regulations, notifications and by-laws of the State or Central Government, or local authorities &amp; other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by the State or Central Government or the local authority. Salient features of the major laws are given in Appendix 1 to the General conditions of contract.</th>
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<tr>
<th>16. The Works to Be Completed by the Intended Completion Date</th>
<th>16.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date</th>
</tr>
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</table>

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<tr>
<th>17. Approval by the Project Manager</th>
<th>17.1 The Contractor shall submit Specifications &amp; Drawings showing the proposed Temporary Works to the Project Manager, for his approval.</th>
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<tr>
<th>17. Approval by the Project Manager</th>
<th>17.2 The Contractor shall be responsible for design of Temporary Works.</th>
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<tr>
<th>17. Approval by the Project Manager</th>
<th>17.3 The Project Manager’s approval shall not alter the Contractor’s responsibility for design of the Temporary Works.</th>
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</table>
17.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.

17.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Project Manager before this use.

| 18. Safety | 18.1 The Contractor shall be responsible for the safety of all activities on the Site. |
| 19. Discoveries | 19.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager’s instructions for dealing with them. |
| 20. Possession of the Site | 20.1 The Employer shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date stated in the PCC, the Employer shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event. |
| 21. Access to the Site | 21.1 The Contractor shall allow the Project Manager and any person authorized by the Project Manager access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out. |
| 22. Instructions, Inspections and Audits | 22.1 The Contractor shall carry out all instructions of the Project Manager which comply with the applicable laws where the Site is located.  
22.2 The Contractor shall keep, and shall make all reasonable efforts to cause its Subcontractors & sub-consultants to keep, accurate and systematic accounts and records in respect of the Works in such form and details as will clearly identify relevant time changes and costs.  
22.3 The Contractor shall permit & shall cause its Subcontractors & sub-consultants to permit, the Bank and/or persons appointed by the Bank to inspect the Site and/or the 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 the Bank if requested by the Bank. The Contractor’s and its Subcontractors’ and sub-consultants’ attention is drawn to Sub-Clause 25.1 which provides, inter alia, that acts intended to materially impede the exercise of the Bank’s inspection & audit rights provided for under Sub-Clause 22.2 constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Bank’s prevailing sanctions procedures). |
| 23. Appointment of the Dispute Review Expert | 23.1 The Dispute Review Expert [DRE] named in PCC shall be appointed jointly by the Employer and the Contractor, at the time of the Employer’s issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the DRE, the Employer will request the Appointing Authority designated in the PCC, to appoint the DRE within 14 days |
23.2 The DRE should be in a position before “notice to proceed with work” is issued to the contractor and an agreement should be signed with the DRE jointly by Employer/Contractor in the form attached – Appendix 3.

24.1 If the Contractor believes that a decision taken by the Project Manager was either outside the authority given to the Project Manager by the Contract or that the decision was wrongly taken, the decision shall be referred to the DRE within 14 days of the notification of the Project Manager’s decision. 

24.2 The DRE shall give a decision in writing within 28 days of receipt of a notification of a dispute.

24.3 The DRE shall be paid daily at the rate specified in the PCC, together with reimbursable expenses of the types specified in the PCC, and the cost shall be divided equally between the Employer and the Contractor. Whatever decision is reached by the DRE, either party may refer that to an Arbitrator within 28 days of the DRE’s written decision. If neither party refers the dispute to arbitration within the above 28 days, the DRE’s decision shall be final and binding.

24.4 The arbitration shall be conducted in accordance with the arbitration procedures published by the institution named and in the place specified in the PCC. The Arbitrator shall give a decision in writing within 120 days of start of the proceedings except otherwise agreed to by the Parties. The Arbitrators shall entertain only those issues which have been earlier referred to the DRE and either party is dissatisfied with the decision given by the DRE.

25.1 The Bank requires compliance with its policy in regard to corrupt and fraudulent practices as set forth in Appendix to the GCC.

25.2 The Employer requires the Contractor to disclose any commissions or fees that may have been paid or are to be paid to agents or any other party with respect to the bidding process or execution of the Contract. The information disclosed must include at least the name and address of the agent or other party, the amount and currency, and the purpose of the commission, gratuity or fee.

B. Time Control

26.1 Within the time stated in the PCC, after the date of the Letter of Acceptance the Contractor shall submit to the Project Manager for approval a revised Program (revising the program given along with the bid) including Environmental Management Plan showing the general methods, arrangements, order, and timing for all the activities in the Works along with monthly cash flow forecasts.

26.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.

26.3 The Contractor shall submit to the Project Manager for approval an updated Program at intervals no longer than the period stated in the PCC. If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount stated in the PCC from the next
payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted.

26.4 The Project Manager’s approval of the Program shall not alter the Contractor’s obligations. The Contractor may revise the Program and submit it to the Project Manager again at any time. A revised Program shall show the effect of Variations and Compensation Events.

26.5 The Contractor shall furnish monthly progress reports as directed by the Project Engineer by 7th of the succeeding month. The report shall include charts and detailed descriptions of the progress of identified activities, photographs showing status of progress at site, records of Contractor’s personnel and equipment, Quality Assurance documents, comparison of actual and planned progress as per program.

27. Extension of the Intended Completion Date

27.1 The Project Manager shall extend the Intended Completion Date including milestones if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date as per agreed milestones without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost.

27.2 The Project Manager shall decide whether & by how much to extend the Intended Completion Date /milestones within 21 days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date/milestones.

28. Acceleration

28.1 When the Employer wants the Contractor to finish before the Intended Completion Date, the Project Manager shall obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Employer accepts these proposals, the Intended Completion Date shall be adjusted accordingly and confirmed by both the Employer and the Contractor.

28.2 If the Contractor’s priced proposals for acceleration are accepted by the Employer, they are incorporated in the Contract Price and treated as a Variation.

29. Delays Ordered by the Project

29.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.

30. Management Meetings

30.1 Either the Project Manager or the Contractor may require the other to attend a management meeting. (This will be held at the place specified in PCC. The periodicity to be fixed by Project Manager / Contractor jointly). The business of a management meeting shall be to review the progress of construction with reference to the construction program given in accordance with GCC 26.1, the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.
30.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

31. Early Warning

31.1 The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price, or delay the execution of the Works. The Project Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.

31.2 The Contractor shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Project Manager.

32. Quality Assurance

32.1 The Contractor shall institute Quality Assurance (QA) & Quality Control (QC) systems in accordance with Quality Assurance Plan to demonstrate compliance with the requirements of the Contract as approved by the Project Manager.

32.2 Compliance with the QA/QC systems shall not relieve the Contractor of any of his duties obligations or responsibilities under the Contract.

33. Tests

33.1 The Contractor shall provide all apparatus, assistance, documents & 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.

33.2 If the Project Manager instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.

34. Identifying and Correction of Defects

34.1. The Project Manager shall check the Contractor’s work and notify the Contractor of any defects that are found specifying a time by which it should be corrected. Such checking shall not affect the Contractor’s responsibilities. The Project Manager may instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.

34.2 The contractor shall permit the Employer’s Technical auditor to check
34.3 The Project Manager shall give notice to the Contractor of any Defects [specifying a time limit by which it should be corrected] before the end of the Defects Liability Period, which begins at Completion, and is defined in the PCC. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

34.4 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Project Manager’s notice.

35. Uncorrected Defects

35.1 If the Contractor has not corrected a Defect within the time specified in the Project Manager’s notice, the Project Manager shall assess the cost of having the Defect corrected and the Contractor shall pay this amount.

Note: 1. Where in certain cases, the technical specifications provide for acceptance of works within specified tolerance limits at reduced rates, Engineer will certify payments to Contractor accordingly.

2. Where the failure to correct a particular defect within the specified time is considered as a fundamental breach of contract a notice should be given to the contractor as stated in GCC 57.2(e).

D. Cost Control

36. Contract Price

36.1 The Bill of Quantities shall contain priced items for the Works to be performed by the Contractor. The Bill of Quantities is used to calculate the Contract Price. The Contractor will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item.

37. Changes in the Contract Price

37.1 If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 1 percent of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change.

(a) If the quantity of work executed exceeds the quantity of the item in BOQ beyond the higher specified limit the Project Manager shall fix the rate to be applied for the additional quantity of the work executed.

(b) If the quantity of work executed less than the quantity of the item in BOQ lesser than the lower specified limit, the Project Manager shall fix the rate to be applied for whole of the quantity of the work so executed.

37.2 The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15
percent, except with the prior approval of the Employer.

37.3 If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.

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<tr>
<th>38. Variations</th>
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<tr>
<td>38.1 All Variations shall be included in updated Programs, produced by the Contractor.</td>
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<tr>
<td>38.2 The Contractor shall provide the Project Manager with a quotation (with breakdown of unit rates) for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.</td>
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<tr>
<td>38.3 If the work in the Variation corresponds to an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work above the limit stated in Sub-Clause 37.1 or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work.</td>
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<td>38.4 If the Contractor’s quotation is unreasonable,[or if contractor fails to provide the Project Manager with a quotation within a reasonable time specified by Project Manager in accordance with GCC38.2] the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager’s own forecast of the effects of the Variation on the Contractor’s costs.</td>
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<tr>
<td>38.5 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.</td>
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<tr>
<td>38.6 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.</td>
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<tr>
<th>39. Cash Flow Forecasts</th>
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<tbody>
<tr>
<td>39.1 When the Program, is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast. The cash flow forecast shall be in Indian Rupees.</td>
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<tr>
<th>40. Payment Certificates</th>
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<tr>
<td>40.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously along with details of measurement of the quantity of works executed in a tabular form approved by the Project Manager.</td>
</tr>
<tr>
<td>40.2 The Project Manager shall check the details given in the Contractor’s monthly statement and within 14 days certify the amounts to be paid to the Contractor after taking into account any credit or debit for the month in</td>
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</table>
question in respect of materials for the works in the relevant amount and under conditions set forth in GCC Sub-Clause 49.4 [Secured Advance]

40.3 The value of work executed shall be determined by the Project Manager after due check measurement of the quantities claimed as executed by the contractor or

40.4 The value of work executed shall comprise of the value of the quantities of work in the Bill of Quantities that have been completed;

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

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

41. Payments

41.1 Payments shall be adjusted for deductions for advance payments, retention, other recoveries in terms of contract & taxes to be deducted at source [TDS] as per applicable law. The Employer shall pay the Contractor the amounts certified by the Project Manager within 28 days of the date of each certificate. If the Employer makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at 8% per annum

41.2. If an amount certified is increased in a later certificate or as a result of an award by the DRE or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated at the rate stated in GCC 41.1 above, from the date upon which the increased amount would have been certified in the absence of dispute.

41.3 Items of the Works for which no rate or price has been entered in shall not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.

42. Compensation Events

42.1 The following shall be Compensation Events:

(a) The Employer does not give access to a part of the Site by the Site Possession Date pursuant to GCC Sub-Clause 20.1.

(b) The Employer modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract.

(c) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time.

(d) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects.

(e) The Project Manager unreasonably does not approve a subcontract to be let.

(f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to bidders (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site.

(g) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional work required for safety or other reasons.

(h) Other contractors, public authorities, utilities, or the Employer does
not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.

(i) The advance payment is delayed.

(j) The effects on the Contractor of any of the Employer’s Risks.

(k) The Project Manager unreasonably delays issuing a Certificate of Completion.

42.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.

42.3 As soon as information demonstrating the effect of each Compensation Event upon the Contractor’s forecast cost has been provided by the Contractor, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly. If the Contractor’s forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager’s own forecast. The Project Manager shall assume that the Contractor shall react competently and promptly to the event.

42.4 The Contractor shall not be entitled to compensation to the extent that the Employer’s interests are adversely affected by the Contractor’s not having given early warning or not having cooperated with the Project Manager.

43. Tax

43.1 The rates quoted by the Contractor shall be deemed to be inclusive of the Vat, Sales and other taxes that the Contractor will have to pay for the performance of this Contract. The Employer will perform such duties in regard to the deduction of such taxes at source [TDS] as per applicable law.

44. Currencies

44.1 All payments shall be made in Indian Rupees.

45. Price Adjustment

THIS CLAUSE IS NOT APPLICABLE FOR THIS TENDER

45.1 Contract price shall be adjusted for increase or decrease in rates and price of labour, materials, fuels and lubricants and other inputs to the works in accordance with the principles and procedures outlined below. A table of adjustment data is included in the PCC which indicates the coefficients of various inputs and the sources of indices for various schedules of BOQ. If the PCC does not include a table of adjustment data this sub clause shall not apply and there shall be no price adjustment.

(a) The price adjustment according to sub para (d) below, shall apply for the work done from the start date given in the PCC up to the end of the Intended Completion Date. If there is delay in completion beyond such date for reasons attributable to the contractor, the Price Adjustment for the work carried out during such period, for reasons attributable to the Contractor, shall be regulated by sub-para (g) below.

(b) The Contract Price shall be adjusted to take account of any increase or decrease in cost after the base date, which affect the Contractor in performance of obligations under the Contract.

(c) The total value (R) of the work done during the specified period [GCC
40.1] shall be as under

: $R = \text{SUM} \{RS1 + RS2 + RS3 + \ldots \ldots . RSn\}$,

Where,

‘$RSn$’ is the value of work done during the specified period to which the price adjustment shall be applied for the relevant schedule of Bill of Quantities (BOQ) specified in P.C.C during the specified period, and represented as under

: $RSn = (V sn + S sn) \text{minus} \text{amount of secured advance recovered in the same period} + \text{value of works executed under variations for which price adjustments will be worked separately based on terms mutually agreed between the Project Engineer and the Contractor}$

where, $V sn$ is the total value of work done during the specified period for the respective schedule of BOQ, and $S sn$ is the secured advance paid during the specified period for the respective schedule of BOQ.

(d) The adjustment to be applied to the amount otherwise payable to the Contractor, as valued in accordance with the appropriate schedule of BOQ and certified in Payment Certificates, shall be determined from formulae which shall be of the following general type:

$$Pn = a + b \frac{Ln}{Lo} + c \frac{En}{Eo} + d \frac{Mn}{Mo} + \ldots . . . . . . .$$

where, “$Pn$” is the adjustment multiplier to be applied to the value of the work done during the period “$n$”, this period being a month unless otherwise stated in the PCC. “$a$” is a fixed coefficient, stated in the relevant table of adjustment data, representing the non-adjustable portion in contractual payments; “$b$”, “$c$”, “$d$”,... 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;

“$Ln$” [Labour], “$En$”[Equipment], “$Mn$”[Material],..... are the current cost indices or reference prices for period “$n$”, each of which is applicable to the relevant tabulated cost element [Labour, Equipment, Steel, Cement, Fuel/Lubricants, Bitumen, others] on the date specified in the Table-2 of Adjustment Data, prior to the last day of the period (to which the particular Payment Certificate relates); and

(e)  (f)

(g) The weightings (coefficients) for each of the factors of cost stated in the table(s) of adjustment data shall only be varied by the Project Manager if they have been rendered unreasonable, unbalanced or inapplicable, as a result of Variations.

(h) Unless otherwise stated in the P.C.C., the Price adjustment shall be done in each monthly Interim Payment Certificate [IPC]. The coefficients and indices are given in the Tables of Adjustment Data in Contract data. to the extent that full compensation for any rise or fall in costs to the contractor is not covered by the provisions of this or other clauses in the contract, the unit rates and prices included in the contract shall be deemed to include amounts to cover the contingency of such other rise or fall in costs.

46. Retention

46. 1 The Employer shall retain from each payment due to the Contractor the proportion stated in the PCC until Completion of the whole of the Works
46.2 Upon the issue of a Certificate of Completion of the Works by the Project Manager, in accordance with GCC 53.1, half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Project Manager has certified that all Defects notified by the Project Manager to the Contractor before the end of this period have been corrected. On completion of the whole works the Contractor may substitute the balance retention money with an “on demand” Bank guarantee.

47. Liquidated Damages

47.1 The Contractor shall pay liquidated damages to the Employer at the rate per day stated in the PCC for each day that the Completion Date is later than the Intended Completion Date (for the whole of the works or the milestones as stated in the PCC). The total amount of liquidated damages shall not exceed the amount defined in the PCC. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor’s liabilities.

47.1.1 Time is the essence of the contract and payment or deduction of liquidated damages shall not relieve the contractor from his obligation to complete the work as per agreed construction program and milestones, or from any of the other contractor’s obligations and liabilities under the contract.

47.2 If the Intended Completion Date including milestones is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC Sub-Clause 41.1.

48. Bonus not used

48.1 Not used.

49. Advance Payment Secured Advances

49.1 The Employer shall make advance payment to the Contractor of the amounts stated in the PCC by the date stated in the PCC, against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the Employer in amounts in Indian Rupees equal to the advance payment. The Guarantee shall remain effective until the advance payment has been repaid, but the amount of the Guarantee shall be progressively (each installment not less than Rs. 500,000) reduced by the amounts repaid by the Contractor. Interest shall not be charged on the advance payment.

49.2 The Contractor is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Project Manager.

49.3 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, Liquidated Damages.
The Engineer shall make advance payment in respect of materials intended for but not yet incorporated in the Works in accordance with conditions stipulated in the PCC.

50. Securities

50.1 The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount specified in the PCC, by a Nationalized or Schedule bank in India, and denominated. The Bank Guarantee for Performance Security and additional security for unbalanced bids shall be valid until a date 28 days from the date of issue of the Certificate of Completion.

51. Day works

51.1 Not used.

52. Cost of Repairs

52.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at the Contractor’s cost if the loss or damage arises from the Contractor’s acts or omissions.

E. Finishing the Contract

53. Completion

53.1 The Contractor shall request the Project Manager to issue a Certificate of Completion of the Works, and the Project Manager shall do so upon deciding that the whole of the Works is completed.

54. Taking Over

54.1 The Employer shall take over the Site and the Works within seven days of the Project Manager’s issuing a certificate of Completion.

55. Final Account

55.1 The Contractor shall supply the Project Manager with a detailed account of the total amount that the Contractor considers payable under the Contract at the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor’s account if it is correct and complete. If it is not, the Project Manager shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate within 56 days of receiving the contractor’s revised account.

56. Operating and Maintenance Manuals

56.1 If “as built” Drawings [including a compact disk containing digitized drawings] and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the PCC.

56.2 If the Contractor does not supply the Drawings [including a compact disk containing digitized drawings] and/or manuals by the dates stated in the PCC pursuant to GCC Sub-Clause 56.1, or they do not receive the Project Manager’s approval, the Project Manager shall withhold the amount stated in the PCC from payments due to the Contractor.

57. Termination

57.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract after giving fourteen (14) days written notice.

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

(a) the Contractor stops work for 28 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized.
by the Project Manager;
(b) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 28 days;
(c) the Employer or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation;
(d) a payment certified by the Project Manager is not paid by the Employer to the Contractor within 84 days of the date of the Project Manager’s certificate;
(e) the Project Manager gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager;
(f) the Contractor does not maintain a Security, which is required;
(g) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as defined in the PCC; or
(h) if the Contractor, in the judgment of the Employer, has engaged in corrupt or fraudulent practices in competing for or in executing the Contract, pursuant to GCC Clause 25.1, then the Employer may, after giving fourteen (14) days written notice to the Contractor, terminate the Contract and expel him from the Site.
(i) The contractor has contravened Clauses 7 and 9 of GCC.
(j) The contractor does not adhere to the agreed construction program & agreed environmental management plan [Clause 26 of GCC] and also fails to take satisfactory remedial action as per agreements reached in the management meetings [Clause 30] for a period of 60 days.
(k) The contractor fails to carry out of the instructions of Engineer within a reasonable time determined by the Engineer in accordance with GCC Clause 15.1 and 22.
(l) The contractor (in case of Joint Venture) has modified the composition of the joint venture and/or the responsibility of each member of the joint venture from what is stated in joint venture agreement without the prior approval of the Employer.

57.3 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under GCC Sub-Clause 57.2 above, the Project Manager shall decide whether the breach is fundamental or not.

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

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

58. Payment upon Termination

58.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate less other recoveries due in terms of contract, less taxes to be deducted at source [TDS] as per applicable law & less the percentage to apply to the value of
the work not completed, as indicated in the PCC. Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer.

58.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Project Manager shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works & the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate less other recoveries due in terms of the contract and less taxes due to be deducted at source [TDS] as per applicable law.

59. Property

59.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Employer if the Contract is terminated because of the Contractor's default.

60. Release from Performance

60.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Contractor, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which a commitment was made.

61. Suspension of Bank Loan or Credit

61.1 In the event that the Bank suspends the Loan or Credit to the Employer, from which part of the payments to the Contractor are being made:

(a) The Employer is obligated to notify the Contractor of such suspension within 7 days of having received the Bank's suspension notice.

(b) If the Contractor has not received sums due it within the 28 days for payment provided for in Sub-Clause 40.1, the Contractor may immediately issue a 14-day termination notice.
**APPENDIX TO GENERAL CONDITIONS**

**Bank’s Policy - Corrupt and Fraudulent Practices**

**Guidelines for Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers, dated January 2011:**

**“Fraud and Corruption:**

| 1.16 | It is the Bank’s policy to require that Borrowers (including beneficiaries of Bank loans), bidders, suppliers, contractors and their agents (whether declared or not), subcontractors, sub-consultants, service providers or suppliers, and any personnel thereof, observe the highest standard of ethics during the procurement and execution of Bank-financed contracts. In pursuance of this policy, the Bank:

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

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

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

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

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

(v) “obstructive practice” is:

(aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a 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

(bb) acts intended to materially impede the exercise of the Bank’s inspection & audit rights provided for under paragraph 1.16(e) below.

(b) will reject a proposal for award if it determines that the bidder recommended for award, or any of its personnel, or its agents, or its sub-consultants, subcontractors, service providers, suppliers and/or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;
(c) will declare mis-procurement and cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Borrower or of a recipient of any part of the proceeds of the loan engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices during the procurement or the implementation of the contract in question, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur, including by failing to inform the Bank in a timely manner at the time they knew of the practices;

(d) will sanction a firm or individual, at any time, in accordance with the prevailing Bank’s sanctions procedures, including by publicly declaring such firm or individual ineligible, either indefinitely or for a stated period of time: (i) to be awarded a Bank-financed contract; and (ii) to be a nominated

(e) will require that a clause be included in bidding documents and in contracts financed by a Bank loan, requiring bidders, suppliers & contractors, and their sub-contractors, agents, personnel, consultants, service providers, or suppliers, to permit the Bank to inspect all accounts, records, and other documents relating to the submission of bids & contract performance & to have them audited by auditors appointed by the Bank:’
### Section VII. Particular Conditions of Contract

#### General

<table>
<thead>
<tr>
<th>GCC 1.1 (d)</th>
<th>The financing institution is: International Development Association</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCC 1.1 (r)</td>
<td>The Employer is <em>Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur.</em> Contact Person :- Mr. Ghanekar</td>
</tr>
<tr>
<td>GCC 1.1 (v)</td>
<td>The Intended Completion Date for the whole of the Works shall be as indicated in the IFB.</td>
</tr>
<tr>
<td>GCC 1.1 (y)</td>
<td>The Project Authority(Employer) is Mr. Ghenkar <em>Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur.</em></td>
</tr>
<tr>
<td>GCC 1.1 (aa)</td>
<td>The Site is located at <em>Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur.</em></td>
</tr>
<tr>
<td>GCC 1.1 (dd)</td>
<td>The Start Date shall be one week after the date of issue of notice to proceed with works to the contractor.</td>
</tr>
</tbody>
</table>

**2.2** Sectional Completions are: Plant Bld. To be taken first

| GCC 2.3(j) | The following documents also form part of the Contract: list documents |

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Document</th>
<th>Description of the document</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B.O.Q. Methodology</td>
<td>Bill of Quantity</td>
</tr>
<tr>
<td>2</td>
<td>Various Drg.</td>
<td>Various Plan, Elevation &amp; Design. Drgs</td>
</tr>
<tr>
<td>3</td>
<td>General Specification</td>
<td>Specification for R.C.C., Brick work, Steel work as per need.</td>
</tr>
</tbody>
</table>

**GCC 3.1** The language of the contract is *English.* The law that applies to the Contract is the laws of Union of India.

**GCC 5.1** The Managing Director may not delegate any of his duties and responsibilities
GCC 7.1 The ceiling for sub-contractor is =NIL

GCC 8.1 Schedule of other contractors: Shall be provided as per need – N.A.

GCC 9.1 Key Personnel and equipment: as mentioned in Clause ITB 5.5B under BDS

GCC. 13.1 (I) The selected bidder has take insurance for the project ,the minimum insurance amounts shall be:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Description</th>
<th>Minimum cover for insurance</th>
<th>Maximum deductible foe insurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>Works and plant and materials which are incorporated in works</td>
<td>RS. 25 lakh</td>
<td></td>
</tr>
<tr>
<td>(ii)</td>
<td>Loss or damage to construction Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iii)</td>
<td>Other property belonging to the project</td>
<td>RS. 25 Lakh</td>
<td></td>
</tr>
<tr>
<td>(iv)</td>
<td>Personal injury or death insurance : a) for other people</td>
<td>Minimum RS. 3.00 Lacs per person</td>
<td>&amp; in accordance with the statutory requirements applicable in India</td>
</tr>
<tr>
<td></td>
<td>b) for contractor’s Employees</td>
<td>In accordance with the statutory requirements applicable in India</td>
<td></td>
</tr>
</tbody>
</table>

GCC. 14.1 Site data : As per lay out plan

GCC. 20.1 Site Possession Date(s) shall be : within 3 days of placement of order.

GCC 23.1 & N.A.

GCC 23.2 N.A.

GCC 24.3 N.A.

GCC 24.4 The procedure for arbitration will be as follows:

In case of Dispute or difference arising between the Employer and a domestic contractor relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Arbitration and Conciliation Act, 1996. The arbitral tribunal shall consist of 3 Arbitrators one each to be appointed by the Employer and the Contractor. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties and shall act as Presiding Arbitrator. In case of failure of the two Arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the Arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the President of the Institution of Engineers (India) Note: [Sub-para (b) is applicable in case of contract award to foreign contractors].
(b) In the case of dispute with a Foreign contractor the dispute shall be settled in accordance with provisions of UNCITRAL Arbitration Rules. The Arbitral Tribunal shall consist of three Arbitrators one each to be appointed by the Employer and the Contractor. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties, and shall act a presiding Arbitrator. In case of failure of the two Arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the Arbitrator appointed, the Presiding Arbitrator shall be appointed by the* President of the Institution of Engineers (India)/.

(c) If one of the parties fails to appoint its Arbitrator in pursuance Of sub-clause (a) and (b) above within 30 days after receipt of the notice of the appointment of its Arbitrator by the other party, then the President of the Institution of Engineers (India) both in cases of Foreign Contractor as well as Indian Contractor, shall appoint the Arbitrator. A certified copy of the order of the President of the Institution of Engineers (India) making such an appointment shall be furnished to each of the parties.

(d) Arbitration proceedings shall be held at Kolhapur, India & the language of the arbitration proceedings and that of all documents and communications between the parties shall be English or Hindi.

(e) The decision of the majority of Arbitrators shall be final & binding upon both parties. The cost and expenses of Arbitration proceedings will be paid as determined by the arbitral tribunal. However, the expenses incurred by each party in connection with the preparation, presentation, etc. of its proceedings as also the fees and expenses paid to the Arbitrator appointed by such party or on its behalf shall be borne by each party itself.

(f) ( NOT APPLICABLE)Where the value of the contract is Rs.50 million and below, the disputes or differences arising shall be referred to the Sole Arbitrator. The Sole Arbitrator should be appointed by agreement between the parties; failing such agreement, by the appointing authority, namely the * Indian Council of Arbitration/President of the Institution of Engineers (India)/The International Centre for Alternative Disputes Resolution (India).

(g) Performance under the contract shall continue during the arbitration proceedings and payments due to the contractor by the Employer shall not be withheld, unless they are the subject matter of the arbitration proceedings.

### B. Time Control

| GCC 26.1 | The Contractor shall submit a detailed Program for the within 14 days of delivery of the Letter of Acceptance. |
|GCC 26.3 | The period between programme updates is 30 days. The amount to be withheld for late submission of an updated programme is Rs. 1,00,000.00. |
|GCC 30.1 | The venue of the management meeting will be Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur. |
### C. Quality Control

| GCC 34.3 | The Defects Liability Period is: 365 days from date of handing over. |

### D. Cost Control

| GCC 45.1 | Price Adjustment: NOT APPLICABLE |
| GCC 46.1 | The proportion of payments retained (Retention Money) shall be 5% from each bill subject to the maximum of 5% of the final contract price. |
| GCC 47.1 | The liquidated damages for the whole of the Works are 0.1% (PER DAY) OF THE TOTAL CONTRACT PRICE. The maximum amount of liquidated damages for the whole of the project is 10% of the final Contract Price. |
| GCC 49.1 | The amount of the advance payment are: |

<table>
<thead>
<tr>
<th>Nature of Advance Amount (Rs.)</th>
<th>Conditions to be fulfilled</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mobilization 5% of the Contract price</td>
<td>On submission of un-conditional Bank Guarantee. (to be drawn before end of 20% Contract period)</td>
</tr>
<tr>
<td>2. Equipment (This advance is not applicable for equipment already owned or hired/leased by the contractor.) 90% for new and 50% of depreciated value for old equipment. Total amount will be subject to a maximum of 5%/10%/15%* of the Contract price. (*Choose one and delete others) – 5% of the Contract price.</td>
<td>After equipment is brought to site as per agreed construction program (provided the Managing Director/Project Manager is satisfied that the equipment is required for performance of the contract) and on Submission of unconditional Bank Guarantee for amount.</td>
</tr>
</tbody>
</table>
| 3. Secured advance for non-perishable materials brought to site [Specify the item or items for which this will be given here] of Invoice value or Market value – lower of the two. | a. of advance.  
b. The materials are in-accordance with the specification for Works;  
c. Such materials have been delivered to site, and are properly stored and protected against damage or deterioration to the satisfaction of the Project Manager.  
d. the Contractor’s records of the |
3. Aggregate requirements, orders, receipt and use of materials are kept in a form approved by the Managing Director/Project Manager and such records shall be available for inspection by the Managing Director/Project Manager;

e. The contractor has submitted with his monthly statement the estimated value of the materials on site together with such documents as may be required by the Managing Director/Project Manager for the purpose of valuation for material and providing evidence of ownership and payment thereof;

f. Ownership of such materials shall be deemed to vest in the Employer for which the Contractor has submitted an Indemnity Bond in an acceptable format; and

g. The quantity of materials are not excessive and shall be used within a reasonable time as determined by the Managing Director/Project Manager.

(The advance payment will be paid to the Contractor no later than 15 days after fulfillment of the above conditions).

Repayment of advance payment for mobilization and equipment:

The advance shall be repaid with percentage deductions from the interim payments certified by the Engineer under the Contract. Deductions shall commence in the next Interim Payment Certificate following that in which the total of all such payments to the contractor has reached not less than 15 percent of the Contract Price or 3 months from the date of payment of first installment of advance, whichever period concludes earlier, and shall be made at the rate of 7.5% (percent) of the amounts of all Interim Payment Certificates until such time as the advance has been repaid, always provided that the advance shall be completely repaid prior to the expiry of the original time for completion.

Repayment of secured advance:

The advance shall be repaid from each succeeding monthly payments to the extent materials [for which advance was previously paid pursuant to Clause 49 of GCC and 49.1(3) of PCC.] have been incorporated into the Works.
@ Stipulate appropriately, namely 30% for 20% advance, 25% for 15% advance, and 15% for 10% advance and 7.5% for 5% advance respectively.

<table>
<thead>
<tr>
<th>GCC 50.1</th>
<th>The Performance Security for 10 percent of contract price to BE provided by the bidders. The standard form of Performance Security acceptable to the Employer shall be an unconditional Bank Guarantee from a Scheduled or Nationalized bank in India of the type as presented in Section X of the Bidding Documents.</th>
</tr>
</thead>
</table>

**E. Finishing the Contract**

<table>
<thead>
<tr>
<th>GCC 56.1</th>
<th>* The date by which operating and maintenance manuals are required is within 28 days of issue of certificate of completion of whole or section of work. The date by which “as-built” drawings including a compact disc containing digitized drawings in 2 sets are required is within 28 days of issue of certificate of completion of whole or section of the work, as the case may be.</th>
</tr>
</thead>
</table>

| GCC 56.2 | The amount to be withheld for failing to produce “as built” drawings and / or operating and maintenance manuals * by the date required in G.C.C. 56.1 is Rs.@ THE RATE OF 1% OF TOTAL CONTRACT PRICE |
| GCC 57.2 | (g) The maximum number of days for LD calculation are : 100 DAYS. |
| GCC 58.1 | The percentage to apply to the value of the work not completed, representing the Employer’s additional cost for completing the Works, is 20%. |
Appendices

Appendix 1

Salient Features of Labour Laws

SALIENT FEATURES OF SOME MAJOR LABOUR LAWS

APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER
CONSTRUCTION WORK

(The law as current on the date of bid opening will apply)

<table>
<thead>
<tr>
<th>Labour Laws</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Workman Compensation Act 1923: The Act provides for compensation in case of injury by accident arising out of and during the course of employment.</td>
<td></td>
</tr>
<tr>
<td>(b) Payment of Gratuity Act 1972: gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years' service or more or on death the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.</td>
<td></td>
</tr>
<tr>
<td>(c) Employees P.F. and Miscellaneous Provision Act 1952 (since amended): The act provides for monthly contribution by the employer plus workers @ 10% or 8.33%. The benefits payable under the Act are:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(i) Pension or family pension on retirement or death, as the case may be.</td>
</tr>
<tr>
<td></td>
<td>(ii) Deposit linked insurance on the death in harness of the worker.</td>
</tr>
<tr>
<td></td>
<td>(iii) Payment of P.F. accumulation on retirement/death etc.</td>
</tr>
<tr>
<td>(d) Maternity Benefit Act 1951: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.</td>
<td></td>
</tr>
<tr>
<td>(e) Contract Labour (Regulation &amp; Abolition) Act 1970: The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by Law. The Principal Employer is required to take Certificate of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ 20 or more contract labour.</td>
<td></td>
</tr>
<tr>
<td>(f) Minimum Wage Act 1948: The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a schedule employment. Construction of Buildings, Roads, and Runways are schedule employments.</td>
<td></td>
</tr>
<tr>
<td>(g) Payment of Wages Act 1936: It lies down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.</td>
<td></td>
</tr>
<tr>
<td>(h) Equal Remuneration Act 1979: The Act provides for payment of equal wages for work of equal nature to Male and Female workers &amp; for not making discrimination against Female employees in the matters of transfers, training &amp; promotions etc.</td>
<td></td>
</tr>
</tbody>
</table>
(i) Payment of Bonus Act 1965: The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs.3500/- per month or less. The bonus to be paid to employees getting Rs.2500/- per month or above upto Rs.3500/- per month shall be worked out by taking wages as Rs.2500/- per month only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act.

(j) Industrial Disputes Act 1947: the Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations, a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

(k) Industrial Employment (Standing Order) Act 1946: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and gets the same certified by the designated Authority.

(l) Trade Unions Act 1926: The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.


(n) Inter-State Migrant workmen’s (Regulation of Employment & Conditions of Service) Act 1979: The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home upto the establishment and bank etc.

(o) The Building and Other Construction works (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996: All the establishments who carry on any building or other construction work and employs 10 or more workers and covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the Building or construction work and other welfare measures, such as Canteens, First Aid facilities, Ambulance, Housing accommodations for workers near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

(p) Factories Act 1948: the Act lays down the procedure for approval at plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding
accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process

(q) Weekly Holidays Act -1942

SALIENT FEATURES OF SOME OF THE MAJOR LAWS THAT ARE APPLICABLE FOR PROTECTION OF ENVIRONMENT.

| Laws on protection of Environment | 1. The Water(Prevention and Control of Pollution) Act, 1974, This provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. ‘Pollution’ means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.

2. The Air (Prevention and Control of Pollution) Act, 1981, This provides for prevention, control and abatement of air pollution. ‘Air Pollution’ means the presence in the atmosphere of any ‘air pollutant’, which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

3. The Environment(Protection) Act, 1986, This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. ‘Environment’ includes water, air and and and the inter-relationship which exists among and between water, air and land & human beings, other living creatures, plants, micro-organism & property.

4. The Public Liability Insurance Act, 1991, This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under the Environment (Protection) Act 1986, and exceeding such quantity as may be specified by notification by the Central Government. |
## Tables of Adjustment Data
*(Cl. 45 of GCC)*

**Table 1: Coefficients governing the adjustment for changes in cost.**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Coefficients Name</th>
<th>Symbol Schedules (Reference Number) [Description of each schedule is given below]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$S_1$</td>
</tr>
<tr>
<td>1.</td>
<td>Fixed</td>
<td>$a$</td>
</tr>
<tr>
<td>2.</td>
<td>Labour [L]</td>
<td>$b$</td>
</tr>
<tr>
<td>3.</td>
<td>Steel [S]</td>
<td>$c$</td>
</tr>
<tr>
<td>4.</td>
<td>Cement [C]</td>
<td>$d$</td>
</tr>
<tr>
<td>5.</td>
<td>Plant &amp; Equipment spares [E]</td>
<td>$e$</td>
</tr>
<tr>
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<tr>
<td>7.</td>
<td>Bitumen [B]</td>
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<td>8.</td>
<td>Others [O]</td>
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*(Fixed element is 15%)*
### Section VIII. Specifications

#### SECTION VIII

TECHNICAL SPECIFICATIONS

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SECTION 1.00 EARTHWORK

Scope

This section covers the works specification of earthwork in excavation in all kinds of soils including murrum, hard murrum, soft rock (without blasting), hard rock (without blasting), rock (with blasting), filling excavated earth in plinths, sand filling in plinth, rubble soling, and brick on edge soling.

Applicable Codes

The following Indian Standard Codes, unless otherwise specified herein, shall be applicable. In all cases, the latest revision of the codes shall be referred to.

a. IS - 4081 Safety code for blasting and related drilling operations
b. IS - 1200 Method of measurement of building works.
c. IS - 3764 Safety code for excavation work.
d. IS - 3385 Code of practice for measurement of Civil Engineering works.
e. IS - 2720 Part II Determination of moisture content.

Part VIII Determination of moisture content dry density relation using light compaction.

Part XXVIII Determination of dry density of soils, in-place by the sand replacement method.

Part XXIX Determination of dry density of soils, in-place, by the core cutter method.

Drawings

Engineer will furnish all necessary drawings showing the areas to be excavated, filled, sequence of priorities etc. Contractor shall follow strictly such drawings.

General

Contractor shall provide all tools, plants, instruments, qualified supervisory personnel, labor, materials & temporary works, consumables, any & everything necessary, whether or not such items are specifically stated herein, for completion of the Work.

Contractor shall carry out the survey of the site before excavation & set properly all lines & establish levels for various works such as earthwork in excavation for leveling, basement, foundations, plinth filling, roads, drains, cable trenches, pipelines etc. Such survey shall be carried out by taking accurate cross sections of the area perpendicular to established reference/grid lines at 5 m intervals or nearer as determined by Engineer based on ground profile. These shall be checked by Engineer & thereafter properly recorded.

The area to be excavated/filled shall be cleared of fences, trees, plants, logs, slumps, bush, vegetations, rubbish slush etc. & other objectionable matter. If any roots or stumps of trees are found during excavation, they shall also be removed. The material so removed shall be burnt or disposed off as directed by Engineer. Where earth fill is intended, the area shall be stripped of all loose/soft patches, top soil containing
deleterious matter/materials before fill commences.

Relics, Objects of Antiquity, Etc.

All gold, silver, oil minerals archaeological & other findings of importance, all precious stones, coins, treasures, relics, antiquities & other similar things which may be found in or upon the site shall be the property of owner & Contractor shall duly preserve the same to the satisfaction of GOKUL DAIRY & from time to time deliver the same to such person or persons as GOKUL DAIRY may from time to time authorize or appoint to receive the same.

1.01 Earth work in excavation up to 1.50 M from existing GL

Note: Sequence does not necessarily refer the sr. no. of Items in schedule of quantities. Contractor shall follow the item description for their specifications.

1.01 (a) Earth work in excavation up to 1.50 M from exiting GL

A. Classification

Any earthwork will be classified under any of the following categories:-

i) All kinds of soils

These shall include all kinds containing kankar, sand, silt, moorum and/or shingle, gravel, clay, loam peat, ash, shale etc. which can generally be excavated by spade, pick-axe and shovel and which is not classified under soft and decomposed rock, and hard rock defined below. This shall also include embedded rock boulders not bigger than 1 meter in any dimension and not more than 200 mm in any one of the other two dimensions.

ii) Soft Rock

This shall include rock, boulders, slag, chalk, slate, hard mica schist, laterite etc. which are to be excavated with or without blasting or could be excavated with picks, hammer, crow bars, wedges. This shall also include excavation in macadam and tarred roads and pavements. This shall also include rock boulders not bigger than 1 meter in any dimension and not more than 500 mm in any one of the other two dimensions. Rubble masonry to be dismantled will also be measured under this item.

iii) Hard Rock

This shall include rock which cannot be easily excavated with pick-axes, hammer, crow bars and wedges but has to be either heated where blasting is prohibited or has to be blasted. They shall be stacked separately for measurement.

(B) The earth work in excavation shall be done as per the Architect and structural consultant's drawings up to required depths and levels and alignments in all sorts of soils. The depth of the foundation will be as per the Engineer's instructions. The lining work should be done by the Contractor. Roots or trees met with during the excavation shall be cut and smeared with coal tar. Excavated earth shall be stacked at least 3 m away from the trenches or as per the Engineer's instructions, so that it may not damage the sides of
the excavated trenches. The sides of the excavated trenches shall be vertical and in straight line and bottom uniformly leveled watered, consolidated and ready for termite treatment. The maximum lead for stacking the earth shall be 100 m, unless otherwise categorically specified in the item description. In firm soil if the excavation is deeper than 2 m the sides of the trenches shall be made bigger by allowing steps of 50 cm on either side so as to keep the slope 0.25 to 1. In loose soft or slushy soil the width of the step shall be suitably increased or the sides sloped or shoring and strutting may be done as per the engineer’s instructions.

(D) For excavation for drain work, the sides and the bottoms should be to the required slope, shape and gradient. The cutting shall be done from top to bottom. Under no circumstances shall undermining or under cutting be allowed. The final surface shall be neatly leveled and well compacted. The earth from the cutting shall be directly used for filling either in plinth or on grounds.

(E) For excavation in trenches for pipes nothing extra shall be payable for the lift irrespective of the depth unless specifically mentioned otherwise in the Schedule of Quantities.

(F) If the trenches are made deeper than specified level due to oversight or negligence of the Contractor the extra depth shall be filled up by lean concrete of mix 1:5:10 (1 cement; 5 coarse sand and 10 coarse aggregate of nominal size 40mm) and if the trench is made wider than shown in the drawings the Contractor has to make good at his own cost. The foundation trenches shall be free from water and muck, while the foundation work is in progress.

(G) The trenches which are ready for concreting shall be got approved by the Engineer.

(H) The excavated stacked earth shall be refilled in the trenches and sides of foundation in 150 mm layers and the balance surplus shall be first filled in layers in plinth and the remaining surplus shall be disposed off by uniform spreading within the site/ outside the site as directed by the Engineer.

(I) Adequate protective measures shall be taken by the Contractor to see that the excavation for the building foundation does not affect the adjoining structure’s stability and safety. Contractor will be responsible if he has not taken precaution for the safety of the people, property or neighbor’s property caused by his negligence during the constructional operations.

(J) To the extent available, selected surplus spoils from excavated materials shall be used as backfill. Fill material shall be free from clods, salts, sulphates, organic & other foreign material. All clods of earth shall be broken or removed. Where excavated material is mostly rock, the boulders shall be broken into pieces not larger than 150 mm size, mixed with properly graded fine material consisting of murum or earth to fill up the voids and the mixture used for filling.

(K) As soon as the work in foundations has been accepted and measured, the spaces around the foundations, structures, pits, trenches etc. shall be cleared of all debris and filled with earth in layers 15 cm to 20 cm, each layer being watered, rammed and properly consolidated before the succeeding one is laid. Each layer shall be consolidated to the satisfaction of Engineer.

(L) Mode of measurement for Earth work in excavation including back filling
i) Lead

Lead for deposition/disposal of excavated material, shall be as specified in the respective item of work. If the lead is not specified in the respective item, a basic lead of 500 m shall be considered for quoting rates. Only leads beyond 500m shall be considered as extra lead and the Contractor shall be compensated for the same. For the purpose of measurement of lead the area to be excavated or filled or area on which excavated material is to be deposited/disposed off shall be divided into suitable blocks and for each of the blocks, the distance between centerlines shall be taken as the lead which shall be measured, as far as practically possible, by the shortest straight line route on the plan and not the actual route taken by Contractor. No extra compensation is admissible on the grounds that the lead including that for borrowed materials had to be transported over marshy or katcha land/route.

ii) All excavation shall be measured net. Dimensions for purpose of payment shall be reckoned on the horizontal area of the excavation at the base for foundations of the walls, columns, footings, tanks, rafts or other foundations structure to be built, multiplied by the mean depth from the surface of the ground in accordance with the drawings. Excavation inside slopes shall not be paid for. Contractor may make such allowances in his rates to provide for excavation in side slopes keeping in mind the nature of the soil and safety of excavation. In soft/slushy soil or in firm soil if the excavation is deeper than 2m the sides of the trenches shall be made bigger by allowing steps of 50cm on either side so as to keep slope 0.25 : 1. This shall be paid as per original tender rate. However, if concreting is proposed against the additional/extra excavation made by the Contractor shall be made good by the Contractor with concrete of the same class as in the foundations at his own cost.

iii) Backfilling as per specification the side of foundations of columns, footings, structures, walls, tanks, rafts, trenches etc. with excavated materials will not be paid for separately. It shall be clearly understood that the rate quoted for excavation including backfilling shall include stacking of excavated material as directed, excavation/stacking of selected stacked material, conveying it to the place of final backfill, compaction etc. as specified. As a rule material to be back filled shall be stacked temporarily within the basic lead of 500 meters unless otherwise specified in the item.

iv) The rates quoted shall also include for dumping of excavated materials in regular heaps, bunds, riprap with regular slopes as directed by Engineer within the lead specified and leveling the same so as to provide natural drainage. Rock/soil excavated shall be stacked properly as directed by Engineer. As a rule, all softer material shall be laid along the center of the heaps, harder and more weather resisting materials forming the casing on the sides and the top. Excavated soft rock or hard rock shall be stacked separately.

(v) The bailing out of water shall also be executed by the Contractor at his own cost.

1.02 Earth work in excavation for depth exceeding 1.50 M but not exceeding 3.0 M

The general specification shall be same as for the item 1.01 given above.

1.03 Earth work in excavation for depth exceeding 3.0 M but not exceeding 4.5 M

The general specification shall be same as for the item 1.01 given above.
1.04 Earth work in excavation in rocks from 3.0 to 4.50 M from EGL

(A) Unless otherwise stated herein, IS 4081, safety code from blasting and related drilling operations shall be followed. After removal of over burden, if any, excavation shall be continued in rock to such widths, lengths, and profiles as are shown on the drawings or such other lines and grades as may be specified by Engineer. As far as possible all blasting shall be completed prior to commencement of construction. At all stages of excavation, precautions, shall be taken to preserve the rock below and beyond the lines specified for the excavating, in the soundest possible condition. The quantity and strength of explosive used, shall be such as will neither damage nor crack the reacted by Engineer shall be taken during the blasting operations and care shall be taken that no damage is caused to adjoining buildings or structure as a result of blasting operations. In case of damage to permanent or temporary structures, at his cost. As excavation approaches its final lines and levels, the depth of the charge holes and amount of explosives used shall be progressively and suitably reduced.

(B) Specific permission of Engineer will have to be taken by Contract for blasting rock and he shall also obtain a valid blasting license from the authorities concerned. If permission for blasting is refused by Engineer, the rock shall be removed by wedging, pick boring, heating and quenching or other approved means. All loose/loosened rock in the sides shall be removed by barring wedging, etc. The unit rates for excavation in hard rock shall include the cost of all these operations.

(C) Contractor shall obtain necessary license for storage of explosives fuses and detonators issued to him from Gokul DAIRY’s store or from a supplier arranged by the Contractor, from the authorities dealing with explosives. The fees, if any, required for obtaining such license, shall be borne by Contractor. Contractor shall have to make necessary storage facilities, for the explosives etc. as per rules & regulations of local, state and Central Govt. authorities & Statutory bodies. Explosives shall be kept dry and shall not be exposed to direct rays of sun or be stored in the vicinity of fire, stoves, steam pipes or heated metal, etc. No explosive shall be brought near the work in excess of quantity required for a particular amount of firing to be done and surplus left after firing the holes shall be removed to the magazine. The magazine shall be built as far as possible from the area to be blasted. Engineer’s prior approval shall be taken for the location proposed for the magazine.

(D) In no case shall blasting be allowed closer than 30 m to any structure or to locations where concrete has just been placed. In the latter case the concrete must be at least 7 days old.

(E) For blasting operations, the following points shall be observed:-

i) Contractor shall employ competent and experienced supervisor and licensed blaster in charge for each set of operation. Who shall be held personally responsible to ensure that all safety regulations are carried out.

ii) Before any blasting is carried out, Contractor shall intimate Engineer and obtain his approval in writing for resorting to such operations. He shall intimate the hours of firing charges, the nature of explosive to be used and the precautions taken for ensuring safety.

iii) Contractor shall ensure that all workmen and the personnel at site are excluded from an area within 200M radius from the firing point, at least 15 minutes before firing time by sounding warning siren. The areas shall be encircled by red flags. Clearance signal shall also be given sounding a distinguishing siren.
iv) The blasting of rock near any existing buildings, equipment or any other property shall be done under cover and Contractor has to make all such necessary muffling arrangements. Covering may preferably be done by MS plates with adequate dead weight over them. Blasting shall be done with small charges only and where directed by Engineer, a trench shall have to be cut by chiseling prior to the blasting operation separating the area under blasting from the existing structures.

V) The firing shall be supervised by a Supervisor and not more than six (6) holes at a time shall be set off successively. If the blasts do not tally with the number fired, the misfired holes shall be carefully located after half an hour and when located, shall be exploded by drilling a fresh hole along with misfired hole (but not nearer than 600 mm from it) and by exploding a new charge.

vi) A wooden tamping rod with a flat shall be used to push cartridges home and metal rod or hammer shall not be permitted. The charges shall be placed firmly into place and not rammed or pounded. After a hole is filed to the required depth the balance of the hole shall be filled with stemming which may consist of sand or stone dust or similar inert material.

vii) Contractor shall preferably detonate the explosives electrically.

Viii) The explosive shall be exploded by means of a primer which shall be fired by detonating a fuse instantaneous detonator (FID) or other approved cables. The detonators with FID shall be connected by special nippers.

ix) In dry weather and normal dry excavation, ordinary low explosive gunpowder may be used. In damp rock, high explosive like gelatin with detonator and fuse wire may be used. Under water or for excavation in rock with substantial accumulated seepage electric detonation shall be used.

X) Holes for charging explosive shall be drilled with pneumatic drills, the drilling pattern being so planned that rock pieces after blasting will be suitable for handling without secondary blasting.

xi) When excavation has almost reached the desired level, hand trimming shall have to be done for dressing the surface to the desired level. Any rock excavation beyond an over break limit of 75mm shall be filled up as instructed by Engineer, with concrete of strength not less than M10. The cost of filling such excess depth shall be borne by Contractor and the excavation carried out beyond the limit specified above will not be paid for. Stepping in rock excavation shall be done by hand trimming.

xii) Contractor shall be responsible for any accident to workmen, public or owner's property due to blasting operations. Contractor by Inspector of explosives, or any other Authority duly constituted under the state and/or Union Govt.

Xiii) Mode of Measurement Volume of rock excavated shall be on the basis of length, breadth and depth of excavation indicated on the drawings. No payment will be made for excavations/over break beyond payment line specified, wherever such measurement is not possible, as in case of strata's intermixed with soil, excavated rock shall be properly stacked as directed by Engineer and the volume of rock shall be calculated on the basis of stack measurements after making 40% allowance for voids. The measurement of the earth work shall be paid as per the drawing or the requirements of the site as approved by the Engineer.
xiv) The rate quoted for excavation shall include the following jobs:

   a. Refilling of the trenches & consolidation & spreading as per the Engineer's directions.

   b. Shoring & structing as demanded by the site conditions & as instructed by the Engineer.

1.05 Filling in plinth with selected excavated earth

   (A) Plinth above in layers 15 - 30 cm, watered and compacted with mechanical compaction machines. When filling reaches the finished level, the surface shall be flooded with water, if directed by the Engineer, for at least 24 hours, allowed to dry and then the surface again compacted as specified above to avoid settlements at a later stage. The finished level of the filling shall be trimmed to the level/slope specified.

   (B) Where specified in the item description given in the Schedule of Quantities that the compaction of the plinth fill shall be carried out by means of 10/12 tones rollers smooth wheeled, sheep-foot or wobble wheeled rollers. As rolling proceeds water sprinkling shall be done to assist consolidation. Water shall not be sprinkled in case of sandy fill.

   (C) Mode of Measurement Payment for filling in plinth with selected excavated material will be made as specified/directed. Payment for this work will be made based on measurement of plinth/dimensions filled. The plinth/ground levels shall be surveyed beforehand for this purpose. The lead shall be 500 M. It shall be measured in cum.

1.06 Filling excavated earth in ground for land development.

   (A) No earth fill shall commence until surface water discharges and streams have been properly intercepted or otherwise dealt with as directed by Engineers.

   (B) Filling shall be carried out as indicated in the drawings and as directed by Engineer. If no compaction is called for, the fill may be deposited to the full height in one operation and leveled. If the fill has to be compacted, it shall be placed in layers not exceeding 600 mm and leveled uniformly and compacted before the next layer is deposited.

   (C) Field compaction is called for, test shall be carried out at different stages of filling and also after the fill to the entire height has been completed. This shall hold good for embankments as well.

   (D) Contractor shall protect the earth fill from being washed away by rain or damaged in any other way. Should any slip occur, Contractor shall remove the affected material and make good the slip at his own cost.

   (E) The fill shall be carried out to such dimension and levels as indicated on the drawings after the stipulated compaction. The fill shall be considered as incomplete if the desired compaction has not been obtained.

   (F) Mode of Measurement It shall be measured in cum. The rate shall include all operations such as lead and transport, filling and consolidating as directed.

1.07 Filling in plinth and ground with earth brought from outside

   (A) Filling shall be carried out with approved material as described in 1.01 (J). The material and source shall be subject to prior approval of Engineer. The approved area,
from where the fill material is to be dug, shall be brought from within 10 kms. radial distance from site and shall be cleared of all bushes, roots plants, rubbish etc. top soil containing salts, sulphate and other foreign material shall be removed. The materials so removed shall be burnt or disposed off as directed by Engineer. The Contractor shall make necessary access roads to those areas and maintain the same, if such access road does not exist, at his cost.

(B) If any material is rejected by Engineer, Contractor shall remove the same forthwith from the site at no extra cost to the owner. Surplus fill material shall be disposed off by uniform spreading within the site as instructed by the Engineer.

(C) The compaction shall be carried out as specified in the item no. 1.03 for filling in plinth.

(D) Mode of Measurement Backfilling, plinth filling etc. with borrowed earth will be paid for under specified items. The quoted rate shall include all operations such as clearing, excavation, lead and transport, fill, compaction etc. as specified. Actual quantity of consolidated filling or actual quantity of excavation in the borrow pits (less such top soil which has been excavated and not used for filling) whichever is less shall be measured and paid for in cubic metres. The lead, lift etc. shall be as indicated in the schedule of quantities.

1.08 Providing and filling local sand in trenches, plinth and surrounding areas

(A) At places backfilling shall be carried out with local sand if directed by Engineer. The sand used shall be kept flooded with water for 24 hours to ensure maximum consolidation. Any temporary work required to contain sand under flooded condition shall be to Contractor’s account.

The surface of the consolidated sand shall be dressed to require level or slope. Construction of floors or other structures on sand fill shall not be started until Engineer has inspected and approved the fill.

(B) Mode of measurement

Actual quantity of consolidated sand filling shall be measured and paid in cubic meters.

1.09 Filling in plinth with selected earth for lead exceeding 300 mt. The general specifications is same item no. 1.05.

1.10 Anti-termite Treatment: Pre-construction Anti-termite Treatment

P.C.I. Specifications

These specifications have been formulated for all types of structures with R.C.C. foundation or with load bearing walled foundations. It also covers treatment of building under construction which has already come up to or above plinth level.

1. CHEMICALS

The following chemical shall be used for the soil treatment with the concentration shown against it in aqueous emulsion.

Chlorpyriphos 20 EC 1.0% a.i
2. TREATMENT

The principle of the treatment is to create a chemical barrier below and around the building so as to deny entry to the termites into the building. Treatment is designed depending on the type of building and is described below.

A. TREATMENT FOR BUILDINGS WITHOUT BASEMENT:

The treatment will commence after the foundation and the plinth wall construction is completed. The treatment is carried out in the following stages.

B. Treatment to top surface of plinth filling.

After the soil filling is completed in the plinth area and before the dry rubble packing of sub grade is laid, the entire surface of the filled soil and the top surface of plinth wall/beam shall be treated with the chemical emulsion at 5 ltrs. per sq.m light rodding may be carried out in the soil surface to facilitate absorption of the emulsion.

C. Treatment at junction of wall and floor.

Rodding if necessary to facilitate Soaking, shall be carried out along the junction of wall and soil filling at 15 cm intervals & up to a depth of 30 cm. Emulsion shall be sprayed along the wall junction at 1 ltr. per linear meter so that it mixes thoroughly with the broken-up soil. The disturbed earth is then tamped back in place.

D. Treatment of soil along external perimeter.

The soil around the external perimeter of the building up to a depth of 30 cm shall be treated with the chemical emulsion at 2.25 ltrs. per linear meter of the plinth wall. To facilitate this treatment, a crowbar should be driven into the soil as close as possible to the plinth wall at internals of 15 cm and up to a depth of 30 cm and moved backwards and forwards parallel to the wall to break up the soil so that the chemical emulsion mixes with the soil.

E. Treatment of soil surrounding pipes, wastes and conduit.

When pipes, wastes and conduits enter the soil inside the plinth the soil surrounding the point of entry must be loosened around each such pipe, Waste or conduit for a distance of 15 cm and up to a depth of 7.5 cm and loosened soil shall be treated with chemical emulsion.

F. Treatment for expansion Joints.

The soil beneath these joints should receive special attention. The treatment should be supplemented by treating through the expansion joints after the sub grade has been laid at the rate of 2 liters per linear meter.

3. TREATMENT FOR BUILDINGS WITH BASEMENT

The treatment starts when the excavation is complete and before laying soling and pcc. The treatment is carried out in following stages.

A. Treatment to soil below raft

Before laying the rubble soling and pcc the compacted and leveled soil shall be treated
with the chemical Emulsion at 5 lit. per sq.m.

B. Treatment to soil along the retaining wall.

The soil coming in contract with the retaining wall shall be treated with the Chemical Emulsion at 5 lit. per sq.m. The treatment shall follow the backfilling as backfilling is done in stages of 30 cms but not to exceed a depth of 1 meter. Rodding may be carried out to facilitate the treatment.

C. Treatment to soil along the external perimeter of the building.

The soil around the external perimeter of the building up to a depth of 30 cm shall be treated with the Chemical Emulsion at 2.25 ltr. per linear meter. Rodding may be carried out as explained in item 2 (D) to facilitate this treatment.

(D) Treatment of soil surrounding pipes, wastes and conduits.

When pipes, wastes and conduits enter, the soil inside the area of the foundation, the soil surrounding the point of entry must be loosened around each such pipe, waste or conduit for a distance of 15 cm and upto a depth of 7.5 cm and loosened soil shall be treated with chemical emulsion.

4. SPRAYING EQUIPMENT

A pressure pump shall be used to carry out spraying operations to facilitate proper distribution of chemical in the soil.

Mode of measurement and payment

The length and breadth shall be measured correct to a cm as per the dimension of sanctioned plans. No deduction shall be made nor extra paid for any opening for pipes, etc. up to 0.1 sq.m. The rate shall include the cost of all labor and materials required for the operation involved for satisfactory completion of this item. The sides of the trenches 30 cms. each side and bottom shall be measured under this item.

The rate shall be for a unit of one Sq.meter.

1.12 Providing and filling dry brickbats at all levels

The brickbats shall be of 40-65mm (average) thickness in size. The brickbats shall be clean and mortar free. They should be washed off dust before it is filled. They shall be filled in places as directed by the engineer.

Mode of Measurement

The bulk volume of the filling shall be measured in Cu.M. No deduction shall be made for voids.

1.13 Providing & laying in a compact manner 20 cms thick (average) rubble soling in plinth using average 100 to 150 mm size stones, including filling in the voids with largest possible stones, covering and levelling the surface with layer of course sand well watered and consolidated etc. all complete as directed.

Mode of Measurement
The bulk volume of the filling shall be measured in Cu.M. No deduction shall be made for voids.

SECTION 2.00 CONCRETE WORK

I Applicable Codes

The following codes and standards are made a part of the Specifications. All standards, codes of practices referred to herein shall be the latest edition including all applicable official amendments and revisions.

In case of discrepancy between this specification and those referred to herein, this specification shall prevail.

(a) Materials

2. IS 455 : Specification for Portland blast furnace slag.
4. IS 4031 : Methods of physical tests for hydraulic cement.
5. IS 650 : Specification for standard sand for testing of cement.
7. IS 2386 (Parts I to VIII): Methods of test for aggregates for concrete.
8. IS 516 : Methods of test for strength of concrete.
9. IS 1199 : Methods of sampling and analysis of concrete.
10. IS 2396(1):
    IS 5640 : Flakiness Index of aggregates
11. IS 3025 : Methods of sampling & test (physical & chemical water used in industry)
13. IS 1139 : Specification for hot rolled mild steel & medium tensile steel deformed bars for concrete reinforcement
15. IS 1785 : Specification for plain hard drawn (Part I) steel wire for prestressed concrete.
17. IS 2090: Specification for high tensile steel bars used in prestressed concrete
18. IS 4990 : Specification for plywood for concrete shuttering work.
(b) Equipment
1. IS 1791 : Specification for batch type concrete mixers
2. IS 2438 : Specification for roller pan mixer
3. IS 2505 : Specification for concrete vibrators immersion type
4. IS 2506 : Specification for screed board concrete vibrators
6. IS 3366 : Specification for pan vibrators
8. IS 2722 : Specification for portable swing weigh-batchers for concrete (single and double bucket type)
9. IS 2750 : Specification for steel scaffolding

(c) Codes of Practice
2. IS 1343 : Code of practice for prestressed concrete
3. IS 457 : Code of practice for general construction of plain and reinforced concrete for dams and other massive structures
4. IS 3370 (Part I to IV) : Code of practice for concrete structures for storage of liquids
5. IS 3935 : Code of practice for composite construction
6. IS 3201 : Criteria for design and construction of precast concrete trusses.
7. IS 2204 : Code of practice for construction of reinforced concrete shell roof
8. IS 2210 : Criteria for the design of RC shell structures and folded plates.
(d) Construction Safety

1. IS 3696: Safety code for scaffolds and ladders

(e) Measurement

1. IS 1200: Method of measurement of building works.
   IS 3385: Code of practice for measurement of civil engineering works.

The above mode of measurements shall be applicable only if it is not given specifically in the tender document.

II General

The quality of materials, method & control of manufacture & transportation of all concrete work irrespective of mix, whether reinforced or otherwise shall conform to the applicable portions of this specification.

Engineer shall have the right to inspect the source/s of material/s, the layout and operation of procurement and storage of materials, the concrete batching and mixing equipment, and the quality control system. Such an inspection shall be arranged and engineer’s approval obtained, prior to starting of concrete work.

III Materials

The ingredients to be used in the manufacture of standard concrete shall consist solely of standard type portland cement, clean sand, natural coarse aggregate, clean water & admixtures.

(A) Cement

a. If the Contractor is instructed to supply cement, then the following points shall be applicable:

   i) Unless otherwise specified the cement shall be of grade 53 ordinary Portland cement in 50 kg. bags. The use of bulk cement will be permitted only with the approval of Engineer.

   ii) A certified report attesting to the conformance of the cement to IS specifications by the cement manufacturer’s chemist shall be furnished to engineer.

   iii) Cement held in storage for a period of ninety (90) days or longer shall be tested. Should at any time Engineer have reasons to consider that any cement is defective, then irrespective of its origin, and/or manufacturers test certificate, such cement shall be tested immediately at contractor’s cost at a National Test Laboratory/approved laboratory and until the results of such tests are found satisfactory, it shall not be used in any work. Contractor shall not be entitled to any claim of any nature on this account.
(B) Aggregates

a. Aggregate in general designates both fine and coarse inert materials used in the manufacture of concrete. Fine aggregate is aggregate all of which passes through 4.75 mm IS sieve. Coarse aggregate is aggregate most of which is retained on 4.75 mm sieve.

b. All fine and coarse aggregates proposed for use in the work shall be subject to Engineer's approval and after specific materials have been accepted the source of supply of such materials should not be changed without prior approval of Engineer.

c. Aggregates shall, except as noted above, consist of natural sands, crushed stone and gravel from a source known to produce satisfactory aggregate for concrete and shall be chemically inert, strong, hard, durable against weathering, of limited porosity and free from deleterious materials that may cause corrosion of the reinforcement or may impair the strength and/or durability of concrete. The grading of aggregates shall be such as to produce a dense concrete of specified strength and consistency that will work readily into position without segregation and shall be based on the mix design and preliminary tests on concrete specified later.

d. Sampling and testing

Samples of the aggregates for mix design and determination of suitability shall be taken under the supervision of Engineer and delivered to the laboratory, well in advance of the scheduled placing of concrete. Records of tests which have been made on proposed aggregates and on concrete made from this source of aggregates shall be furnished to Engineer in advance of the work for use in determining aggregate suitability. The costs of all such tests, sampling etc. shall be borne by contractor.

e. Storage of Aggregates

All coarse and fine aggregates shall be stacked in stock separately in stock piles in the material yard near the work site in bins properly constructed to avoid inter mixing of different aggregates. Contamination with foreign materials and with earth during storage and while heaping the materials shall be avoided. The aggregate must be of specified quality not only at the time of receiving at site but more so at the time of loading into mixer. Rackers shall be used for lifting the coarse aggregates from bins or stock piles. Coarse aggregate shall be piled in layers not exceeding 1.20 meters in height to prevent coning or segregation. Each layer shall cover the entire area of the stock pile before succeeding layers are started. Aggregates that have become segregated shall be rejected.

f. Specific Gravity

Aggregate except as noted above, and for other than light weight concrete shall consist of natural or crushed sand shall conform to IS 383. The sand shall be clean sharp, hard, strong and durable and shall be free from dust, vegetable substances, adherent coating, clay, alkali, organic matter, mica, salt or other deleterious substances, which can be injurious to the setting qualities/ strength/ durability of concrete.
(C) Machine made Sand

Machine made sand will be acceptable, provided the constituent rock/gravel composition shall be sound, hard dense, non-organic uncoated and durable against weathering.

i) Screening and Washing
Sand shall be prepared for use for such screening or washing, or both, as necessary, to remove all objectionable foreign matter while separating the sand grains to the required size fractions.

ii) Foreign Material Limitations

The percentages of deteriorous substances in sand delivered to the mixer shall not exceed the following:

<table>
<thead>
<tr>
<th></th>
<th>Material finer than 75 micron IS sieve</th>
<th>3.00</th>
<th>15.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>ii.</td>
<td>Shale</td>
<td>1.00</td>
<td>--</td>
</tr>
<tr>
<td>iii.</td>
<td>Coal and lignite</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>iv.</td>
<td>Clay lumps</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>v.</td>
<td>Total of all above substances including items (i) to (iv) for uncrushed sand &amp; items iii) &amp; (iv) for crushed sand</td>
<td>5.00</td>
<td>2.00</td>
</tr>
</tbody>
</table>

iii) Gradation

Unless otherwise directed or approved, the grading of sand shall be within the limits indicated hereunder:

<table>
<thead>
<tr>
<th>IS Sieve Designation</th>
<th>Grading Zone I</th>
<th>Grading Zone II</th>
<th>Grading Zone III</th>
<th>Grading Zone IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 mm</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>4.75 mm</td>
<td>90-100</td>
<td>90-100</td>
<td>90-100</td>
<td>95-100</td>
</tr>
<tr>
<td>2.36 mm</td>
<td>60-95</td>
<td>75-100</td>
<td>85-100</td>
<td>95-100</td>
</tr>
<tr>
<td>1.18 mm</td>
<td>30-70</td>
<td>55-90</td>
<td>75-100</td>
<td>90-100</td>
</tr>
<tr>
<td>600 micron</td>
<td>15-34</td>
<td>35-59</td>
<td>60-79</td>
<td>80-100</td>
</tr>
<tr>
<td>300 micron</td>
<td>5-20</td>
<td>8-30</td>
<td>12-40</td>
<td>15-50</td>
</tr>
<tr>
<td>150 micron</td>
<td>0-10</td>
<td>0-10</td>
<td>0-10</td>
<td>0-15</td>
</tr>
</tbody>
</table>
Where the grading falls outside the limits of any particular grading zone of sieves other than 600 micron IS sieve, by total amount not exceeding 5 percent, it shall be regarded as falling within that grading zone. This tolerance shall not be applied to percentage passing the 600 micron IS sieve or to percentage passing any other sieve on the coarser limit of grading zone I or the finer limit of grading zone IV.

iv) Fineness Modulus

The sand shall have a fineness modulus of not less than 2.2 or more than 3.2. The fineness modulus is determined by adding the cumulative percentages retained on the following IS sieves sizes 4.75 mm, 2.36 mm, 1.18 mm 600 micron, 300 micron and 150 micron and dividing the sum by 100.

(D) Coarse Aggregate

a. Coarse aggregate for concrete, except as noted above and for other than light weight concrete shall conform to IS. This shall consist of natural or crushed stone and gravel and shall be clean and free from elongated, flaky or laminated pieces adhering coatings, clay lumps, coal residue, clinkers slag, alkali, mica, organic matter or other deleterious matter.

b. Screening and Washing

Natural gravel and crushed rock shall be screened and/or washed for the removal of dirt or dust coating, if so demanded by Engineer.

c. Grading - Coarse aggregate shall be graded in both cases the grading shall be within the following limits.

<table>
<thead>
<tr>
<th>IS Sieve Designation</th>
<th>% passing for single sized aggregate of nominal size mm</th>
<th>% passing for graded aggregate of nominal size mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40 20 16 12.5 10</td>
<td>40 20 16 12.5</td>
</tr>
<tr>
<td>63 mm</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>40 mm</td>
<td>85 100</td>
<td>95 100</td>
</tr>
<tr>
<td>20 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.5 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.75 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.36 mm</td>
<td>- - - - -</td>
<td>- - - - - -</td>
</tr>
</tbody>
</table>
The pieces small be angular in shape and shall have granular or crystalline surfaces, friable, flaky and laminated pieces, mica and shale, if present, shall be only in such quantities that will not, is the opinion of Engineer affect adversely the strength and/or durability of concrete. The maximum size of coarse aggregate shall be 75 mm for class A concrete 40 mm for class B concrete and 20mm for class C concrete. The maximum size of coarse aggregate shall be the maximum size specified above, but in no case greater than 1/4 of the minimum thickness of the member, provided that the concrete can be placed without difficulty so as to surround all reinforcement thoroughly and fill the corners of the form. Plums above 150 mm and up to any reasonable size can be used in plain mass concrete work of large dimensions up to a maximum limit of volume of concrete when specifically approved by Engineer. For heavily reinforced concrete members the nominal maximum size of the aggregate shall be 5 mm less than the minimum clear distance between the reinforcing main bars or 5mm less than the minimum cover to the reinforcement whichever is smaller. The amount of fine particles occurring in the free state or as loose adherent shall not exceed 1% when determined by laboratory sedimentation tests as per IS 2386. After 24 hours immersion in water, a previously dried sample shall not have gained more than 10% of its oven dry weight in air, as determined by IS 2386.

D. Foreign Materials Limitations

The percentages of deleterious substance in the coarse aggregate delivered to the mixer shall not exceed the following:

<table>
<thead>
<tr>
<th>Percent by weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncrushed</td>
</tr>
<tr>
<td>Crushed</td>
</tr>
<tr>
<td>i) Material finer than 75 micron IS sieve</td>
</tr>
<tr>
<td>ii) Coal and lignite</td>
</tr>
<tr>
<td>iii) Clay lumps</td>
</tr>
<tr>
<td>iv) Soft fragments</td>
</tr>
<tr>
<td>v) Total of all the above substances</td>
</tr>
</tbody>
</table>
(E) Water

a. Water used for both mixing and curing shall be free from injurious amounts of deleterious materials. Potable waters are generally satisfactory for mixing and curing concrete.

b. In case of doubt, the suitability of water for making concrete shall be ascertained by the compressive strength and initial setting time test specified in IS-456. The sample of water taken for testing shall be typical of the water proposed to be used for concreting, due account being paid to seasonal variation. The sample shall not receive any treatment before testing other than that envisaged in the regular supply of water proposed for use in concrete. The sample shall be stored in a clean container previously rinsed out with similar water.

c. Average 28 days compressive strength of at least three 15 cm concrete cubes prepared with water proposed to be used shall not be less than 90% of the average strength of three similar concrete cubes prepared with distilled water.

d. The initial setting time or test block made with the appropriate set cement and the water proposed to be used shall not be less than 30 minutes and shall not differ by more than plus minus 30 seconds from the initial setting time of control test block prepared with the appropriate test cement and distilled water. The test blocks shall be prepared and tested in accordance with the requirements of IS 4031.

e. Where water can be shown to contain an excess of acid, alkali sugar or salt, engineer may refuse to permit its use. As a guide, the following concentrations represent the maximum permissible values:

i) To neutralize 200 ml sample of water, using phenolphthalein as indicator, it should not require more than 2 ml of 0.1 normal NaOH. The details of test shall be as given in IS 3025.

ii) To neutralize 900 ml sample of water using methyl arrange as an indicator, it should not require more than 10 ml of 0.1 normal HCl. The details of test shall be given in IS 3025.

iii) Percentage of solids when tested in accordance with the method indicated below shall not exceed the following:

<table>
<thead>
<tr>
<th>Percent</th>
<th>Method of Test (Ref. to clause no. in IS 3025-1964)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>10 &amp; 11 (organic solids = total solids minus ignited residue)</td>
</tr>
<tr>
<td>Inorganic Sulphate (as SO4)</td>
<td>0.30 11 (Ignited residue)</td>
</tr>
<tr>
<td>Alkali Chlorides (as Cl)</td>
<td>0.05 20 0.10 24</td>
</tr>
</tbody>
</table>
(F) Brick aggregates

The brickbats shall be of new bricks well burnt, hard, durable and broken to sizes, well graded. It shall be free from dust, the size shall be of 37mm and down. It shall be free from earth and other impurities.

(G) Reinforcement Steel

If the contractor is instructed to supply reinforcement steel, the following points shall be applicable:

a. Unless otherwise specified the reinforcement bars shall be Thermo Mechanically Treaded (TMT) bars confirming to the specifications of IS 1786.

b. The certified report attesting conformance of the material to IS specifications by manufacturer’s Testing laboratory shall be furnished to the engineer in charge.

c. Reinforcement bars are arranged by contractor, as shown and specified on the drawings. Wire mesh or fabric shall be in accordance with IS 1566. Substitution of reinforcement will not be permitted except upon written approval from Engineer.

d. All reinforcement shall be clean, free from grease, oil, paint, loose mill scale, loose rust, dust, bituminous material or any other substances that will destroy or reduce the bond. All rods shall be thoroughly cleaned before being fabricated. Pitted and defective rods shall not be used.

IV Form Work.

a. The formwork shall consist of shores, bracings, sides of beams and columns, bottom of slabs etc, including ties anchors, hangers inserts etc, complete which shall be properly designed and planned for the work. False work shall be so constructed that necessary adjustment can be made to compensate for take up and settlements. Wedge may be used at the top or bottom of timber shores but not at both ends to facilitate vertical adjustment or dismantling of the formwork.

b. Design of formwork

The design of the formwork as well as its construction shall be the responsibility of Contractor. If so instructed, the drawings and/or calculation for the design for the formwork shall be submitted to Engineer for approval before proceeding with work, at no extra cost. Engineer’s approval shall not however relieve Contractor of the full responsibility for the design and construction of the formwork. The design shall take into account all the load vertical and lateral that the forms will be carrying live and vibration loadings.

χ. Type of formwork

Formwork may be of timber, plywood metal, plastic or concrete. For special finishes the formwork may be lined with plywood, steel sheets oil tempered hard board etc. Sliding forms and slip forms may be used with the approval of Engineer.
d. Form work requirements

i) Forms shall conform to the shapes, lines, grades and dimensions including camber of the concrete as called for on the drawings. Ample studs, braces, ties, straps, etc. shall be used to hold the forms in proper position without any distortion whatsoever until the concrete is set sufficiently to permit removal of forms. Forms shall be strong enough to permit the use of immersion vibrators. In special cases form vibrators may also be used. The shuttering shall be close boarded. Timber shall be well seasoned, free from sap, shakes, loose knots, worm holes, warps or other surface defects in contact with concrete. Faces coming in contact with the concrete shall be free from adhering grout, plaster, paint, projecting nails, splits or other defects. Joints shall be sufficiently tight to prevent loss of water or any fine material from concrete.

ii) Plywood shall be used for exposed concrete surfaces; where called for. Sawn and wrought timber may be used for unexposed surfaces. Inside faces of forms for concrete surfaces which are to be rubbed finished shall be planed to remove irregularities or unevenness in the face. Formwork with linings shall be permitted.

iii) All new and used form timber shall be maintained in a good condition with respect to shape, strength, rigidity, water tightness, smoothness and cleanliness of surfaces. Form timber unsatisfactory in any respect shall not be used and if rejected by Engineer shall be removed from the site.

iv) Shores supporting successive members shall be placed directly over those below or be so designed and placed that the load will be transmitted directly to them. Trussed supports shall be provided for shores that cannot be secured on adequate foundations.

V) Formwork, during any stage of construction showing signs of distortion or distorted to such a degree that the intended concrete work will not conform to the exact contours indicated on the drawings, shall be repositioned and strengthened. Poured concrete affected by the faulty formwork, shall be removed completely and the formwork be corrected prior to placing of new concrete.

vi) Excessive construction camber to compensate for shrinkage, settlement may impair the structural strength of members and shall not be permitted.

vii) Forms shall be so designed that their removal will not damage the concrete. Face formwork shall provide true vertical and horizontal joints, conform to the architectural features of the structure as to location of joints and be as directed by engineer.

Viii) Where exposed smooth or rendered concrete finishes are required the forms shall be constructed with special care so that the resulting concrete surfaces require a minimum finish.
e. **Formwork For Slope Surfaces**

i. Forms for sloped surfaces shall be built so that the formwork can be placed board-by-board immediately ahead of concrete placement so as to enable ready access for placement, vibration inspection and repair of the concrete.

ii) The formwork shall also be built so that the boards can be removed one by one from the bottom up as soon as the concrete has attained sufficient stiffness to prevent sagging. Surfaces of construction joints and finished surfaces with slopes steeper than 4 horizontal: 1 vertical shall be formed as required herein.

f. **Formwork For Curved Surfaces**

i. The contractor shall interpolate intermediate sections as necessary and shall construct the forms so that the curvature will be continuous between sections. Where necessary to meet requirements for curvature, the form timber shall be built up of laminated splines cut to make tight, smooth form surfaces.

ii) After the forms have been constructed, all surface imperfections shall be corrected and all surface irregularities at matching faces of form material shall be dressed to the specified curvature.

g. **Formwork For Exposed Concrete Surfaces**

i) Where it is desired, directed or shown on the drawings to have original fair face finish of concrete surface without any rendering or plastering, formwork shall be carried out by using wood planks, plywood or steel plates of approved quality and as per direction of the Engineer.

ii) The contractor shall use one type of material for all such exposed concrete faces and the forms shall be constructed so as to produce uniform and consistent texture and pattern on the face of the concrete. Patches or forms for these surfaces will not be permitted. The formwork shall be placed so that all horizontal formworks are continuous across the entire surface.

iii) To achieve a finish which shall be free of board marks, the formwork shall be faced with plywood or equivalent material in large sheets. The sheets shall be arranged in an approved pattern. Wherever possible, joints between sheets shall be arranged to coincide with architectural features, cills, window heads or change in direction of the surface. All joints between shuttering plates or panels shall be vertical or horizontal unless otherwise directed. Suitable joints shall be provided between sheets. The joints shall be arranged and fitted so that no blemish or mark is imparted to the finished surfaces.

iv) To achieve a finish which shall give the rough appearance of concrete cast against sawn boards, formwork boards unless otherwise stated shall be of 150 mm wide, securely jointed with tongue and grooved joints if required to prevent grout loss with tie rod positions and direction of boards carefully controlled. Sawn boards shall be set horizontally, vertically or at an inclination shown in the drawings. All bolt holes shall be accurately aligned horizontal and vertically and shall be filled with matching mortar recessed 5mm back from the surrounding concrete face.
v) Forms for exposed concrete surfaces shall be constructed with grade strips (the underside of which indicated top of pour) at horizontal construction joints, unless the use of groove strips is specified on the drawings. Such forms shall be removed and reset from lift to lift, they shall not be continuous from lift to lift. Sheeting of reset forms shall be tightened against the concrete so that the forms will not be spread and permit abrupting irregularities or loss of mortar. Supplementary form ties shall be used as necessary to hold the reset forms tight against the concrete.

vi) For fair faced concrete, the position of through bolts will be restricted and generally indicated on the drawings.

vii) Chamfer strips shall be placed in the corners of forms for exposed exterior corners so as to produce 20 mm bevelled edges except where otherwise shown in the drawings. Interior corners & edges at formed joints shall not be bevelled unless shown on the drgs. Mouldings for grooves, drip courses and bands shall be made in the form itself.

Viii) The wood planks, plywood and steel plates used in formwork for obtaining exposed surfaces shall not be used for more than 3 times in case of wood planks, 6 times for plywood and 10 times for steel plates respectively. However, no forms will be allowed for reuse, if in the opinion of the Engineer it is doubtful to produce desired texture of exposed concrete.

ix) In order to obtain exposed concrete work of uniform colour it shall be necessary to ensure that the sand used for all exposed concrete work shall be of approved uniform colour. Moreover the cement used in the concrete for any complete element shall be from single consignment.

x) No exposed concrete surface shall be rendered or painted with cement or otherwise. Plastering of defective concrete as a means of achieving the required finish shall not be permitted, except in the case of minor porosity on the surface, the Engineer may allow a surface treatment by rubbing down with cement and sand mortar of the same richness and colour as for the concrete. This treatment shall be made immediately after removing the formwork.

xi) The contractor shall also take all precautionary measures to prevent breaking and chipping of corners and edges of completed work until the building is handed over.

h. Bracings struts and props

i) Shuttering shall be braced, strutted, propped and so supported that it shall not deform under weight and pressure of the concrete and also due to the movement of men and other materials. Bamboos shall not be used as props or cross bearers.

ii) The shuttering for beams and slabs shall be so erected that the shuttering on the sides of the beams and under the soffit of slabs can be removed without disturbing beam bottoms. Repropping of beams shall not be done except when props have to be reinstated to take care of construction loads anticipated to be in excess of the design load. Vertical props shall be supported on wedges or other measures shall be taken whereby the props can be gently lowered vertically while striking the shuttering. If the shuttering for a column, is erected for the full height of the column, one side shall be left open and built up in sections as placing of concrete from the sides to limit the drop of concrete to 3M or as directed by engineer.
j. Mould Oil

Care shall be taken to see that the faces of form work coming in contact with concrete are perfectly cleared and two coats of mould oil or any other approved material applied before fixing reinforcement and placing concrete. Such coating shall be insoluble in water, non-staining and not injurious to the concrete. It shall not become flaky or be removed by rain or wash water. Reinforcement and/or other items to be cast in the concrete shall not be placed until coating of the forms is complete, adjoining concrete surface shall also be protected against contamination from the coating arterial.

k. Chamfers and fillets

All corners and angles exposed in the finished structure shall be formed with moulding to form chamfers or fillets on the finished concrete. The standard dimension of chamfers and fillers, unless otherwise specified shall be 20 mm x 20 mm. Care shall be exercised to ensure accurate mouldings. The diagonal face of the mouldings shall be planned or surfaced to the same texture as the forms to which it is attached.

l. Wall ties

Wire ties passing through the walls shall not be allowed. In their place bolts through sleeves be used.

m. Reuse of forms

Before reuse, all forms shall be thoroughly scraped, cleaned, nails removed, holes that may leak suitably plugged and joints examined and when necessary, repaired and the inside retreated to prevent adhesion to the satisfaction of Engineer. Warped lumber shall be resized. Contractor shall equip himself with enough shuttering material to complete the job in the stipulated time.

n. Removal of forms

i) Contractor shall record on the drawings and in a special register the date upon which the concrete is placed in each part of the work and the date on which the shuttering is removed there from. The Contractor shall remove the shuttering after obtaining the approval of the Engineer.

ii) In no circumstances shall forms be struck until the concrete reaches a strength of at least twice the stress due to self weight and any construction/erection loading to which the concrete may be subjected at the time of striking formwork.

iii) In normal circumstances (generally where temperatures are above 20 Deg. Cent.) forms may be removed after expiry of the following periods:-
<table>
<thead>
<tr>
<th></th>
<th>Ordinary portland cement concrete</th>
<th>Rapid hardening portland cement concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Walls columns and as vertical sides of directed by the beams Engineer</td>
<td>24 to 48 hrs</td>
<td>24 hrs.</td>
</tr>
<tr>
<td>b. Slabs left under</td>
<td>3 days</td>
<td>2 days</td>
</tr>
<tr>
<td>c. Beam soffits props left under</td>
<td>7 days</td>
<td>4 days</td>
</tr>
<tr>
<td>d. Removal of props to slabs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Spanning upto 4.5 m</td>
<td>7 days</td>
<td>4 days</td>
</tr>
<tr>
<td>ii) Spanning over 4.5 m</td>
<td>14 days</td>
<td>8 days</td>
</tr>
<tr>
<td>e. Removal of props to beams &amp; arches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Spanning upto 6 m</td>
<td>14 days</td>
<td>8 days</td>
</tr>
<tr>
<td>ii) Spanning over 6 m</td>
<td>21 days</td>
<td>12 days</td>
</tr>
</tbody>
</table>

iv) Striking shall be done slowly with utmost care to avoid damage to arises and projections and without shock or vibration, by gently easing the wedges. If after removing the form work, it is found that timber has been embedded in the concrete, it shall be removed and made good as specified earlier.

v) Reinforced temporary openings shall be provided as directed by Engineer to facilitate removal of formwork which otherwise may be inaccessible.

vi) Tie rods, clamps, form bolts etc. which must be entirely removed from walls or similar structures shall be loosened not sooner than 24 hours nor later than 40 hrs after the concrete has been deposited. Ties, except those required to hold forms in place, may be removed at the same time. Ties, withdrawn from walls & grade beams shall be pulled towards the inside face cutting ties back from the faces of walls & grade beams will not be permitted.

vii) For liquid retaining structures no sleeves for through bolts shall be used nor shall through bolts be removed as indicated above. The bolts, in this case, shall be cut at 25 mm depth from the surface and then the hole shall be made good by sand, cement mortar of the same proportions as the concrete just after striking the formwork.

2.01 Providing and laying Brickbats Cement concrete 1:4:8 (1 cement 4 coarse sand, 8 brickbats of size 37 mm and down).

The brickbats, sand & cement shall be of quality as described in the materials section above. The materials shall be mixed in volumetric proportions in concrete mixer only. The concrete shall be laid in layers of 150mm thick & well consolidated with rammer of weight 4.5 to 5.5 kg steel rammers of base area 300sqcm till slurry comes on top before next layer is laid. Curing shall be done for 7 days. For joints the edge of the concrete shall be finished off with a slope not steeper than 2:1 and well roughened.

Mode of Measurement

This shall be measured in cum & part thereof. The bed concrete provided for flooring shall be paid for under this item. The rate shall include cost the shuttering to be provided.
2.02 Providing and laying plain cement concrete 1:4:8 (1 cement, 4 coarse sand, 8 graded stone aggregate of nominal size 37 mm and down)

The coarse aggregate, cement and coarse sand shall be of quality as specified in the materials section. The other procedures are same as that specified in item no. 2.01.

2.03 Providing and laying Plain cement concrete 1:3:6 (1 cement, 3 coarse sand, 6 graded stone aggregates of nominal size 37 mm and down)

The general specification is same as for item no. 2.02 but for the volumetric proportion of the coarse sand and stone aggregates which shall be 3:6 instead of 4:8.

2.04 Providing and laying RCC of mix M20 for structures up to plinth level

Mix Design

a) All concrete in the works shall be of design mix as defined in IS 456, unless it is a nominal mix concrete such as 1:3:6, 1:4:8 or 1:5:10. Whether reinforced or otherwise, all design mix concrete works to be carried out under this specification shall be divided into the following classifications:

MINIMUM COMPRESSIVE STRENGTH OF 15 CM CUBES AT 7 AND 28 DAYS AFTER MIXING, CONDUCTED IN ACCORDANCE WITH IS 516

<table>
<thead>
<tr>
<th>Class</th>
<th>Preliminary test N/SQ.MM</th>
<th>Work test N/SQ.MM</th>
<th>Max. size of aggregate Content per cum. (mm)</th>
<th>Cement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>at 7days</td>
<td>at 18 days</td>
<td>at 7days</td>
<td>at 28 days</td>
</tr>
<tr>
<td>M42</td>
<td>35.0</td>
<td>54.0</td>
<td>27.0</td>
<td>46.0</td>
</tr>
<tr>
<td>M35</td>
<td>31.0</td>
<td>45.0</td>
<td>23.5</td>
<td>39.0</td>
</tr>
<tr>
<td>M30</td>
<td>28.0</td>
<td>42.0</td>
<td>20.0</td>
<td>33.0</td>
</tr>
<tr>
<td>M25</td>
<td>23.5</td>
<td>35.0</td>
<td>17.0</td>
<td>28.0</td>
</tr>
<tr>
<td>M20</td>
<td>19.4</td>
<td>29.0</td>
<td>13.5</td>
<td>22.0</td>
</tr>
<tr>
<td>M15</td>
<td>14.0</td>
<td>17.0</td>
<td>10</td>
<td>16.0</td>
</tr>
</tbody>
</table>
b. It shall be very clearly understood that whenever the class of concrete such as M 20 is specified it shall be the Contractor's responsibility to ensure that minimum crushing strength stipulated for the respective class of concrete is obtained at works. The maximum total quantity of aggregate by weight per 50 kg of cement shall not exceed 450 kg except when otherwise specifically permitted by Engineer.

c. To fix the grading of aggregates, water cement ratio, workability and the quantity of cement required to give preliminary and works cubes of the minimum strength specified, the proportions of the mix shall be determined by weight/volume. Adjustment of aggregate proportions due to moisture present in the aggregate shall be made. Mix proportioning shall be carried out according to Indian Standard Specifications.

d. Whenever there is a change either in required strength of concrete or water cement ratio or workability or the source of aggregates and/or cement, preliminary tests shall be repeated to determine the revised proportions, of the mix to suit the altered conditions.

e. While fixing the value for water cement ratio for preliminary mixes, assistance may be derived from the graph (appendix IS 456 showing the relationship between the 28 day compressive strengths of concrete mixes with different water cement ratios and the 7 days compressive strength of cement tested in accordance with IS 269.

Preliminary tests

a. Test specimens shall be prepared with at least two different water/cement ratios for each class of concrete, consistent with workability required for the nature of the work. The materials and proportions used in making preliminary tests shall be similar in all respects to those to be actually employed in the works as the object of these tests is to determine the proportions of cement, aggregates and water necessary to produce concrete of required consistency and to give the specified strength. It will be the Contractor's sole responsibility to carry out these tests and he shall therefore furnish to Engineer a statement of proportions proposed to be used for the various concrete mixes.

b. Materials shall be brought to the room temperature and all materials shall be in a dry condition. The quantities of water, cement and aggregates for each mix shall be determined by weight/volume to an accuracy of 1 part in 1000 parts.

c. Mixing shall be done by a mixer machine as per IS 516 in such a manner as to avoid loss of water. The cement and fine aggregate shall first be mixed dry until the mixture is uniform in colour. The coarse aggregate shall then be added, mixed and water added and mixed thoroughly for a period of not less than 3 minutes until the resulting concrete is uniform in appearance. Each mix of concrete shall be of such a quantity as to leave about 10% excess concrete after moulding the desired number of test specimens.
d. The consistency of each mix of concrete shall be measured immediately after mixing, by the slump test in accordance with IS 1199. If in the slump test, care is taken to ensure that no water or other materials is lost, the materials used for the slump test may be remixed with the reminder of the concrete for making the specimen test cubes. The period of re-mixing shall be as short as possible yet sufficient to produce a homogeneous mass.

e. Compression tests of concrete cubes shall be made as per IS 516 on 15 cm cubes. Each mould shall be provided with a metal base having a plane surface so as to support the mould during filling without leakage. The base plate shall be preferably attached to the mould by springs or screws. The parts of the mould when assembled shall be positively and rigidly held together. Before placing concrete the mould and base plate shall be cleaned and oiled. The dimensions and internal faces of the mould shall be accurate within the following limits:

- Height and distance between the opposite faces of the mould shall be of specified size plus minus 0.2mm. The angle between the adjacent internal faces and between internal faces and top and bottom planes of mould shall be 90 Deg. plus/minus 5 Deg.
- The interior faces of the mould shall be plane surfaces with a permissible variation 0.03 mm.

f. Concrete test cubes shall be moulded by placing fresh concrete in the mould and compacted as specified in IS 516.

g. Curing shall be as specified in IS 516. The cubes shall be kept in moist air of at least 90% relative humidity at a temp. of 27 Deg. Cent. plus minus 2 Deg. Cent. for 24 hours plus minus half hour from the time of adding water to the dry ingredients. Thereafter they shall be removed from the moulds and kept immersed in clean, fresh water and kept at 27 Deg. Cent. plus minus 2 Deg. Cent. temp. until required for test. Curing water shall be renewed every seven days. A record of maximum and minimum temperatures at the place of storage of the cubes shall be maintained during the period they remain in storage.

h. Testing of specimens The strength shall be determined based on not less than five cubes test specimens for each age and each water cement ratio. All these laboratory test results shall be tabulated and furnished to Engineer. The test result shall be accepted by Engineer if the average compressive strengths of the specimens are tested subject to the condition that only one out of the five consecutive test may give a value less than the specified strength for that age. The Engineer may direct the Contractor to repeat the tests if the results are not satisfactory and also to make such changes as he considers necessary to meet the requirements specified. All these preliminary tests shall be conducted by the Contractor at his own cost in an approved laboratory.

Proportioning consistency, batching and mixing of concrete

a. Aggregate

The proportions which shall be decided by conducting preliminary test shall be by volume. These proportions of cement, fine and coarse aggregates shall be
The supply of properly graded aggregate of uniform quality shall be maintained over the period of work, the grading of aggregates shall be controlled by obtaining the coarse aggregate in different sizes and blending them in the right proportions. The different sizes shall be stockpiled in separate stock piles. The grading of coarse and fine aggregate shall be checked as frequently as possible as determined by Engineer, to ensure maintaining of grading in accordance with the samples used in preliminary mix design. The material shall be stock piled well in advance of use.

b. Cement

The cement shall be measured by volume.

c. Water

Only such quantity of water shall be added to the cement and aggregates in the concrete mix as to ensure dense concrete, specified surface finish, satisfactory workability, consistent with the strength stipulated for each class of concrete. The water added to the mix shall be such as not to cause segregation of material or the collection of excessive free water on the surface of the concrete.

The water cement (W/C) ratio is defined as the volume of water in the mix (including the surface moisture of the aggregates) divided by the volume of cement in the mix. The actual water cement ratio to be adopted shall be determined in each instance by the Contractor and approved by the Engineer.

d. Proportioning by water/Cement ratio

The W/C ratio specified for use by Engineer shall be maintained. The Contractor shall determine the water content of the aggregates as frequently as directed by Engineer as the work progress and as specified in IS 2386 (Part-III) and the amount of water added at the mixer shall be adjusted as directed by Engineer so as to maintain the specified W/C ratio. To allow for the variation in volume of aggregates due to variation in their moisture content suitable adjustments in the volume of aggregates shall also be made.

e. Consistency and slump

Concrete shall be of a consistency and workability suitable for the conditions of the job. After the amount of water required is determined, the consistency of the mix shall be maintained throughout the progress of the corresponding parts of the work and approved tests e.g. slump tests, compacting factor tests, in accordance with IS 1199 shall be conducted from time to time to ensure the maintenance of such consistency.

f. The following tabulation gives a range of slumps which shall generally be used for various types of construction unless otherwise instructed by the Engineer.
SLUMPS FOR VARIOUS TYPES OF CONSTRUCTION

Only sufficient quantity of water shall be added to concrete during mixing to produce a mix of sufficient workability to enable it to be well consolidated, to be worked into the corners of the shuttering and around the reinforcement, to give the specified surface finish, and to have the specified surface strength. The following slumps shall be adopted for different kinds of works:

<table>
<thead>
<tr>
<th>Name of Work</th>
<th>When vibrato used</th>
<th>When vibrato not used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass concrete in foundations, footings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>retaining walls and pavements</td>
<td>10mm to 25mm</td>
<td>50mm to 75mm</td>
</tr>
<tr>
<td>Thin sections of floors of less than 75mm thick</td>
<td>75mm</td>
<td>25mm to 40mm</td>
</tr>
<tr>
<td>For Reinforced cement concrete work:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass concreting in foundations, footings</td>
<td>10mm to 25mm</td>
<td>80mm</td>
</tr>
<tr>
<td>retaining walls &amp; pavements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beams, slabs, columns</td>
<td>25mm to 40mm</td>
<td>100mm to 125mm</td>
</tr>
<tr>
<td>Thin shells, folded plates etc.</td>
<td>40mm to 50mm</td>
<td>125mm to 150mm</td>
</tr>
</tbody>
</table>

a. Facilities required for sampling materials and concrete in the field shall be provided by the Contractor at no extra cost. The following equipment with operator shall be made available at Engineer’s request (all must be in serviceable condition):

i. One concrete cube testing machine suitable for 15 cm machine suitable for 15 cm cubes of 100 tones capacity with proving calibration ring.

ii) Twelve cast iron cube moulds of 15 cm size

iii) One Lab. balance to weigh up to 5 kg with sensitivity of 10 gm

iv) One set of sieves for coarse and fine aggregates

V) One set of slump cone complete with tamping rod

vi) A set of measures from 5 litre to 0.1 litre

vii) One electric oven with thermostat upto 120 Deg. Cent.

Viii) One flakiness gauge
ix) One elongation index gauge

x) One sedimentation pipette

xi) One Pyconometer

xii) Two calibrated glass jar of 1 litre capacity

Arrangement can be made by the contractor to have the cubes tested in an approved laboratory in lieu of a testing machine at site at his expense, with the prior consent of the Engineer.

b. At least 6 test cubes of each class of concrete shall be made for every 15.0 cu.m. of concrete or part thereof. Such samples shall be drawn on each day for each type of concrete. Of each set of 6 cubes, three shall be tested at 7 days age and three at 28 days age. The laboratory test results shall be tabulated and furnished to Engineer. Engineer will pass the concrete if average strength of the specimens tested is not less than the strength specified, subject to the condition that only one out of three consecutive tests may give a value less than the specified strength but this shall not be less than 90% of the specified strength. The cubes shall be tested on 7th and 28th day from the day of casting of the cubes.

Admixtures

a. Admixtures may be used in concrete only with the approval of Engineer based upon evidence that, with the passage of time, neither the compressive strength nor its durability reduced. Calcium chloride shall not be used for accelerating setting of the cement for any concrete containing reinforcement, or embedded steel parts. When calcium chloride is permitted to be used, such as in mass concrete works, it shall be dissolved in water and added to the mixing water in an amount not to exceed 1.5% of the volume of the cement in concrete. When admixtures are used, the designed concrete mix shall be corrected accordingly. Admixtures shall be used as per manufacturer’s instructions and in the manner and with the control specified by Engineer.

b. Air entraining agents

Where specified and approved by Engineer, neutralized vinyl resin or any other approved air-entraining agent may be used to produce the specified amount of air in the concrete mix and these agents shall conform to the requirements of ASTM standard 6260, air entraining admixtures for concrete. The recommended total air content of the concrete is 4% plus minus 1%. The method of measuring air content shall be as per IS 1199.

C. Water reducing admixtures

Where specified and approved by Engineer water reducing lignosulfonate mixture shall be added in quantities specified by Engineer. The admixtures shall be added in the form of a solution.

d. Retarding admixtures

Where specified and approved by Engineer, retarding agents shall be added to the concrete mix in quantities specified by Engineer.
e. **Water proofing agent**

Where specified and approved by Engineer, water proofing agent conforming to IS:2645 shall be added in quantities specified by Engineer.

**Optional tests**

a. Engineer may order tests to be carried out on cement, sand, coarse aggregate and water in accordance with the relevant Indian Standards. Tests on cement shall include (i) fineness test (ii) test for normal consistency (iii) test for setting time (iv) test for soundness (v) test for tensile strength (vi) test for compressive strength (vii) test for heat of hydration by experiment and by calculations in accordance with IS:269. Tests on sand shall include (i) sieve test (ii) test for organic impurities (iii) decantation test for determining clay and silt content (iv) specific gravity test (v) test for unit weight and bulk age factor. Tests on coarsed aggregate shall include (i) test for sieve analysis (ii) specific gravity and unit weight of dry loose and rodded aggregate (iii) soundness and alkali aggregate reactivity (iv) pictographic examination (v) deleterious materials and organic impurities (vi) test for aggregate crushing value. Any or all these tests would normally be ordered to be carried out only if Engineer feels the materials are not in accordance with the specifications or if the specified concrete strengths are not obtained and shall be performed by contractor at site or at an approved test laboratory. If the tests are successful, SABAR DAIRY shall pay for all such optional tests otherwise the Contractor shall have to pay for them.

b. If the works cubes do not give the stipulated strengths Engineer reserves the right to ask contractor to dismantle such portions of the work, which in his opinion are unacceptable and re-do the work to the standard stipulated at contractor's cost.

c. **Load test on members or any other tests**

i) In the event of any work being suspected of faulty material or workmanship or both, Engineer requiring its removal and reconstruction may order the contractor that it should be load tested in accordance with the following provisions.

ii) The test load shall be 125 % of the maximum superimposed load for which the structure was designed. Such test load shall not be applied before 56 days after the effective hardening of the concrete. During the test, struts strong enough to take the load shall be placed in position leaving a gap under the members. The test load shall be maintained for 24 hours before removal.

iii) If within 24 hours of the removal of the load, the structure dose not show a recovery of at least 75 percent of the maximum deflection shown during the 24 hours under load the test loading shall be repeated after a lapse of at least 72 hours. The structure shall be considered to have failed to pass the test if the recovery after the second test is not at least 75 percent of the maximum deflection shown during the second test. If the structure is certified as failed by Engineer, the cost of the load test shall be borne by the contractor.

iv) Any other tests e.g. taking out in approved manner concrete cores, examination and tests on such cores removed from such parts of the structure as directed by Engineer, sonic testing etc. shall be carried out by contractor if so directed.
v) Should the results of any test prove unsatisfactory, or the structure shows signs of weakness, undue deflection or faulty construction the contractor shall remove and rebuild the member or members involved or carry out such other remedial measures as may be required by SABAR DAIRY. The Contractor shall bear the cost of so doing, unless the failure of the member or members to fulfill the test conditions is proved to be solely due to faulty design.

Concrete in alkali soils and alkaline water

Where concrete is liable to attack from alkali salts or alkaline water, special cements containing low amount of tricalcium aluminate shall be used, if so specified in the drawings. Such concrete shall have a minimum 28 days compressive strength of 250 kg per sq.cm and shall contain not less than 370 kg of cement per cubic metre of concrete in place. If specified, additional protection shall be obtained by the use of a chemically resistant stone facing or a layer of plaster of paris covered with suitable fabric, such as jute thoroughly impregnated with tar.

Preparation prior to concrete placement

a. Before the concrete is actually placed in position, the insides of the form work shall be inspected to see that they have been cleaned and oiled. Temporary openings shall be provided to facilitate inspection, especially at bottom of columns and walls forms to permit removal of saw dust, wood shavings, binding wire, rubbish dirt etc. Openings shall be placed or holes drilled so that these materials and water can be removed easily. Such openings/holes shall be later suitably plugged.

b. The various agencies shall be permitted ample time to install drainage and plumbing lines in floor and trench drains, conduits, hangers, anchors, inserts, sleeves, bolts, frames and other miscellaneous embedment to be cast in the concrete as indicated on the drawings or as is necessary for the proper execution of the work. Contractor shall cooperate fully with all such agencies and shall permit the use of scaffolding form work etc. by other agencies at no extra cost.

c. All embedded parts, inserts etc. supplied by SABAR DAIRY or Contractor shall be correctly positioned and securely held in the forms to prevent displacement during depositing & vibrating of concrete.

d. Anchor bolts shall be positioned & kept in place with the help of proper manufactured templates. The use of all such templates, fixture etc.. shall be deemed to be included in the rates.

e. Slots, openings, holes, pockets etc. shall be provided in the concrete work in the positions indicated in the drawings or as directed by Engineer.

f. Prior to concrete placement all work shall be inspected and approved by Engineer and if found unsatisfactory, concrete shall not be poured until after all defects have been corrected at Contractor’s cost. Cat ladders shall be provided on the reinforcement to facilitate labour movement.

g. Approval by Engineer for all materials & work as required herein shall not relieve contractor from his obligation to produce finished concrete in accordance with the
drawings and specifications.

h. No concrete shall be placed in wet weather or on water covered surface. Any concrete that has been washed by heavy rains, the work shall be entirely removed, if there is any sign of cement and sand having been washed from the concrete mixture. To guard against damage which may be caused by rains, the works shall be covered with tarpaulins immediately after the concrete has been placed & compacted. Any water accumulating on the surface of the newly placed concrete shall be removed by approved means & no further concrete shall be placed thereon until such water is removed. To avoid flow of water over/around freshly placed concrete, suitable drains and sumps shall be provided.

i. Immediately before concrete placement begins, proposed surfaces except framework, which will come in contract with the concrete to be placed, shall be covered with a bonding mortar.

Transportation

a. All buckets, containers or conveyors used for transporting concrete shall be mortar tight. Irrespective of the method of transportation adopted, concrete shall be delivered with the required consistency and plasticity without segregation or loss of slump. However, chutes shall not be used for transport of concrete without the written permission of Engineer & concrete shall not be rehandled before placing.

b. Concrete must be placed in its final position before it becomes too stiff to work. On no account, water shall be added after the initial mixing concrete which has become stiff or has been contaminated with foreign materials shall be rejected and disposed off as directed by Engineer.

c. All equipment used for mixing, transporting & placing of concrete shall be maintained in clean condition. All pans, buckets, hoppers, chutes, pipelines & other equipment shall be thoroughly cleaned after each period of placement.

Procedure for placing of concrete

a. Before any concrete is placed, the entire placing programme, consisting of equipment, layout proposed procedures & methods shall be submitted to engineer for approval if so demanded by Engineer and no concrete shall be placed until Engineer’s approval has been received. Conveyor for conveying concrete shall be of such size & design as to ensure a practically continuous flow of concrete during depositing without segregation of materials, considering the size of the job and placement location.

b. Concrete shall be placed in its final position before the cement shall normally be compacted in its final position within thirty minutes of leaving the mixer & once compacted it shall not be disturbed.

c. Concrete, in all cases, be deposited as nearly as practicable directly in its final position, and shall not be rehandled or caused to flow in a manner which will cause segregation, loss of materials, displacement of reinforcement, shuttering or embedded inserts or impair its strength. For locations where direct placement is not possible & in narrow forms, contractor shall provide suitable drop & elephant trunks to confine the movement of concrete. Special care shall be taken when concrete is dropped from a height especially if reinforcement is in the way, particularly in columns and thin walls.
d. Except when otherwise approved by Engineer, concrete shall be placed in shovels or other approved implements and shall not be dropped from a height more than 1 M or handled in a manner which will cause segregation.

e. The following specification shall apply when placing of concrete by use of mechanical equipment is specifically called for while inviting bids or is warranted considering the nature of work involved. The control of placing shall begin at the mixer discharger, concrete shall be discharged by a vertical drop into the middle of the bucket or hopper & this principle of a vertical discharge of concrete shall be adhered to throughout all stages of delivery until the concrete comes to rest in its final position.

f. Central bottom dump buckets of a type that provides for positive regulation of the amount and rate of deposition of concrete in all dumping position, shall be employed.

g. In placing concrete in large open areas, the bucket shall be spotted directly over position designated & than lowered for dumping. The open bucket shall clear the concrete already in place & the height of drop shall not exceed 1 M. The bucket shall be opened slowly to avoid high vertical bounce. Dumping of buckets on the swing or in any manner which results in separation of ingredients or disturbance of previously placed concrete will not be permitted.

h. Concrete placed in restricted forms by wheel barrows, buggies, cars, short chutes or hand shoveling shall be subject to the requirement for vertical delivery of limited height to avoid segregation & shall be deposited as nearly as practicable in its final position.

i. Where it is necessary to use transfer chutes, specific approval of Engineer must be obtained to the type, length, slopes, baffles, vertical terminals & timing of operations, the discharge and without segregation. To allow for the loss of mortar against the sides of the chutes, the first mix shall have less coarse aggregate. During cleaning of chutes the waste water shall be kept clear of the forms. Concrete shall not be permitted to fall from the end of the chutes by more than 1 M. Chutes when approved for use shall have slopes not flatter than 1:3 & steeper than 1:2 chutes shall be of metal or metal lined & of rounded cross section. The slopes of all chutes sections shall be approximately the same. The discharge end of the chutes shall be maintained above the surface of the concrete in the forms.

j. Concrete may be conveyed & placed by mechanically operated equipment e.g. pumps or pneumatic placers only with the written permission of Engineer. The slump shall be held to the minimum, necessary for conveying concrete by this method.

k. When pumping is adopted, before pumping of concrete is started, the pipeline shall be lubricated with one or two batches of mortar composed of one part cement & parts sand. The concrete mix shall be specially designed to suit pumping. Care shall be taken to avoid stoppages in work once pumping has started.

l. When pneumatic placer is used, the manufacturer's advice on layout of pipeline shall be followed to avoid blockages & excessive wear. Restraint shall be provide at the discharge box to cater for the reaction at this end. Manufacturer's advice shall be followed regarding concrete quality & all other related matters when pumping or pneumatic placing equipment are used.
m. Concreting, once started, shall be continuous until the pour is completed. Concrete shall be placed in successive horizontal layers of uniform thickness ranging from 15 to 90 mm as directed by Engineer. These shall be placed as rapidly practicable to prevent the formation of cold joints or planes of weakness between each succeeding layer within the pour. The thickness of each layer shall be such that it can be deposited before the previous layer has stiffened. The bucket loads or other units of deposit shall be spotted progressively along the face of the layer with such overlap as well facilitate spreading the layer to uniform depth and texture with a minimum of shoveling. Any tendency to segregation shall be corrected by shovelling stones into mortar rather than mortar on to stones. Such a condition shall be corrected by redesign of mix or other means, as directed by Engineer.

n. The top surface of each pour and bedding planes shall be approximately horizontal unless otherwise instructed.

p. Compaction
i) Concrete shall be compacted during placing the approved vibrating equipment until the concrete has been consolidated to the maximum practicable density, is free of pockets of coarse aggregate & fits tightly against all form surfaces, reinforcement & embedded fixtures. Particular care shall be taken to ensure that all concrete placed against the forms faces & into corners of forms or against hardened concrete at joints is free from voids or cavities. The use of vibrators shall be consistent with the concrete mix & caution exercised not to over-vibrate the concrete to the point that segregation results.

ii) Vibrators shall conform to IS specifications. Type of vibrator to be used shall depend on the structure where concrete is to be placed. Shutter vibrators to be effective, shall be firmly secured to the formwork which must be sufficiently rigid to transmit the vibration & strong enough not to be damaged by it. Immersion vibrators shall have no load frequency, amplitude & acceleration as per IS 2505 depending on the size of vibrator. Immersion vibrators in sufficient numbers & each of adequate size shall be used to properly consolidate all concrete. Tapping or external vibrating of forms by hand tools or immersion vibrators will not be permitted.

iii) The exact manner of application & the most suitable machines for the purpose must be carefully considered & operated by experienced men. Immersion vibrators shall be inserted vertically at points not more than 450 mm apart & withdrawn when air bubbles cease to come to the surface. Immersion vibrators shall be withdrawn very slowly. In no case shall immersion vibrators be used to transport concrete inside the forms. Particular attention shall be paid to vibration at the top of a lift e.g. in a column or wall.

iv) When placing concrete in layers, which are advancing horizontally as the work progresses, great care shall be exercised to ensure adequate vibration, blending & mixing of the concrete between the succeeding layers.

v) The immersion vibrator shall penetrate the layer being placed & also penetrate the layer below with the under layer is still plastic to ensure good bond & homogeneity between the two layers & prevent the formation of cold joints.

vi) Care shall be taken to prevent contact of immersion vibrators against reinforcement steel. Immersion vibrators shall not be allowed to come in contact with
reinforcement steel after start of initial set. They shall also not be allowed to come in contact with forms or finished surfaces.

vii) Form attached vibrators shall be used only with specific authorization of Engineer.

Vii) The surface vibrators will not be permitted under normal conditions. However for thin slabs vibration by specially designed vibrators may be permitted upon approval of Engineer.

ix) The formation of stone pockets or mortar bondages in corner & against faces of forms shall not be permitted. Should these occur, they shall be dug out, reformed & refilled to sufficient depth & shape for through bonding, as directed by Engineer.

q. Placement interval

Except when placing with slip forms each placement of concrete in multiple lift work, shall be allowed to set for at least 24 hours after the final set of concrete & before the start of a subsequent placement.

r. Special provision in placing

When placing concrete in walls with openings & in floors of integral slab & beam construction and other similar

s. Placing concrete through reinforcement steel

When placing concrete through reinforced steel, care shall be taken to prevent segregation of the coarse aggregate. When the congestion of steel makes placing difficult it may be necessary to temporarily move the top steel aside to get proper placement and restore reinforcing steel to design position.

t. Bleeding

Bleeding of free water, on top of concrete being deposited, in to the forms shall be caused to stop the concrete pour. The conditions causing this defect corrected before any further concreting is resumed.

Curing, Protecting, Repairing and finishing

A. Curing

i. All concrete shall be cured by keeping it continuously damp for the period of time required for complete hydration & hardening to take place. Preference shall be given the use of continuous sprays or ponded water continuously saturated covering of sacks, canvas, hessian or other absorbent materials, or approved effective curing compounds applied with spraying equipment capable of producing a smooth, even textured coat. Extra precautions shall be exercised in curing concrete during cold and hot water as outlined hereinafter. The quality of curing water shall be the same as that used for mixing concrete.

ii) Certain types of finish or preparation for overlaying concrete must be done at certain stage of the curing process & special treatment may be required for specific concrete surface finish.
iii) Curing of concrete made of high alumina cement & supersulphated cement shall be carried out as directed by Engineer. Unit rate are also inclusive & necessary centering & shuttering work which shall be as per following:

iv) Fresh concrete shall be kept continuously wet for a minimum period of 10 days from the date of placing of concrete following a lapse of 12 to 14 hours after laying of concrete. The curing of horizontal surfaces exposed to the drying winds shall however begin immediately the concrete has hardened. Water shall be applied uniformly to concrete surfaces within 1 hour after concrete has set. Water shall be applied to formed surfaces immediately upon removal of forms quantity of water applied shall be controlled so as to prevent erosion of freshly placed concrete.

v) Curing shall be assured by use of an ample water supply under pressure in pipes with all necessary appliance of hose, sprinklers & spraying devices. Continuous fine mist spraying or sprinkling shall be used, unless otherwise specified or approved by Engineer.

vi) Whenever, by the judgment of Engineer, it may be necessary to omit the continuous spray method, a covering of clean sand or other approved means such as wet gunny bags which will prevent loss of moisture from the concrete, may be used. No type of covering will be approved which would stain or damage the concrete during or after the curing period. Covering shall be kept continuously wet during the curing period.

vii) For curing of concrete in pavements, side-walks floors, flat roofs or other level surfaces, the ponding method of curing is preferred. The method of containing the ponded water shall be approved by Engineer. Special attention shall be given to edges and corners of the slabs to ensure proper protection to these area. The ponded area shall be kept continuously filled with water during the curing period.

viii) Surface coating type compounds shall be used only by special permission of Engineer, curing compounds shall be liquid type white pigmented. Other curing compounds shall be used on surfaces where future blending with concrete, water or acid proof membrane or painting is specified.

ix) All equipment and materials required for curing shall be on hand and ready for use before concrete is placed.

B. Protecting fresh concrete

Fresh concrete shall be protected from defacements & damage due to construction operation by leaving forms in place for an ample period as specified later in this specification. Newly placed concrete shall be protected by approved means such as tarpaulins from rain, sun & winds. Steps as approved by Engineer shall also be taken to protect immature concrete from damage by debris, excessive loading, vibration, abrasion or contact with other materials etc, that may impair the strength and/or durability of the concrete. Workmen shall be warned against & prevented from disturbing green concrete during it setting period. If it is necessary that workmen enter the area of freshly placed concrete, Engineer may require that bridges be placed over the area.

C. Repair and replacement of unsatisfactory concrete

i) Immediately after the shuttering is removed, the surface of concrete shall be very carefully inspected & all defective areas called to the attention of Engineer who may
permit patching of the defective areas or also reject the concrete unit either partially or entirely. Rejected concrete shall be removed & replaced by contractor at no additional expense to owner. Holes left by from bolts etc. shall be filled up & made good with mortar composed of one part of cement to one & half parts of sand passing 2.36 mm IS sieve after removing any loose stones adhering to the concrete shall be finished as described under the particular items of work.

ii) Superficial honey combed surfaces & rough patches shall be similarly made good immediately after removal of shuttering in the presence of Engineer & superficial water & air holes shall be filled in. The mortar shall be well worked into the surface with a wooden float. Excess water shall be avoided. Unless instructed otherwise by Engineer the surface of the exposed concrete placed against shuttering shall be rubbed down immediately on removal of shuttering to remove fine or other irregularities & necessary care being taken to avoid damage to the surface. Surface irregularities shall be removed by grinding.

iii) If reinforcement is exposed or the honeycombing occurs at vulnerable positions e.g. ends of beams or columns it may be necessary to cut out the member completely or in part & reconstruct. The decision of Engineer shall be final in this regard. If only patching is necessary, the defective concrete shall be cut out till solid concrete is reached (or to a minimum depth of 25mm) the edges being cut perpendicular to the affected surface or with small under cut if possible. Anchors, tees or dovetail slots shall be provided whenever necessary to attach the new concrete securely in place an area extending several centimeters beyond the edges & the surfaces of the prepared voids shall be saturated with water for 24 hours immediately before the patching material is placed.

iv) The use of epoxy for bonding fresh concrete used for repairs will be permitted upon written approval of Engineer. Epoxy shall be applied in strict accordance with the instructions of the manufacturer.

V) Small size holes having surface dimensions about equal to the depth of the hole, holes left after removal of form bottom, grout insert holes & slots cut for repair of cracks shall be repaired as follows. The hole to be patched shall be roughened and thoroughly soaked with clean water until absorption stops. A 5mm thick layer of grout of equal parts of cement & sand shall be well brushed into the surface to be patched, followed immediately by the patching concrete which shall be well consolidated with a wooden float. The concrete patch shall be built up in 10 mm thick layers. After an hour or more, depending upon weather conditions, it shall be worked off flush with a wooden float and smooth finished obtained by wiping with hessian, a steel trowel shall be used for this purpose. The mix for patching shall be of same material and in the same proportions as that used in the concrete being repaired, although some reduction in the maximum size of the coarse aggregates may be necessary and the mix shall be kept as dry as possible. Mortar filling by air pressure (guniting) shall be used for repairing of areas too large and/or too shallow for patching with mortar. Patched surfaces shall be given a final treatment to match the colour and texture of the surrounding concrete. While cement shall be substituted for ordinary cement, if so directed by Engineer, to match the shade of the patch with original concrete.

vi) The patched area shall be covered immediately with an approved non-staining water saturated material such as gunny bag which shall be kept continuously wet and protected against sun and wind for a period of 24 hours. Thereafter, the
patched area shall be kept wet continuously by fine spray of sprinkling for not less than 10 days.

vii) All materials, procedures and operations used in the repairing of concrete and also the finished repair work shall be subject to the approval of Engineer. All fillings shall be tightly bonded to the concrete and shall be sound, free from shrinkage cracks after the fillings have been cured and finished.

Finishing

i) The type of finish for formed concrete surface shall be as follows, unless, otherwise specified by the Engineer. For surfaces against which backfill or concrete is to be placed, no treatment is required except repairing of defective areas.

For surface below grade which will receive waterproofing treatment the concrete shall be free of surface irregularities which would interfere with proper application of the waterproofing material which is specified for use.

Unless specified, surfaces which will be exposed when the structure is in service shall receive no special finish, except repairing of damage or defective concrete removal of fins and abrupt irregularities, fillings of holes left by form ties and rods and clean up of loose or adhering debris.

ii) Surfaces which will be exposed to the weather & which would normally be level, shall be sloped for drainage. Unless the drawing specifies such as stair treads, walls shall be sloped across the width approximately 1 in 30 broader surface such as walkways., roads, parking areas & platforms shall be sloped about 1 in 50. Surfaces that will be covered by backfill or concrete sub floors to be covered either concrete topping, terrazzo or quarry tile & similar surfaces shall be smooth screened & leveled to produce even surfaces. Surface irregularities shall not exceed 6mm. Surfaces which will not be covered by backfill, concrete or tile toppings such as outside decks, floors of galleries & sumps, parapets, gutters, sidewalks floors & slabs shall be consolidated, screeded & floated. Excess water & laitance shall be removed before finishing. Floating may be done with hand or power tools & started as the screeded surface has attained a stiffness to permit finishing operation & these shall be the minimum required to produce a surface uniform in texture & free from screed marks or other imperfections. Joints edges panels & forms linings shall be of uniform size & be as large as practicable & installed with closed joints. Upon removal of forms the joint marks shall be smoothed off & all blemishes, projections etc, removed leaving the surfaces reasonably smooth & unmarred.

iv) Integral cement concrete finish When specified on the drawings & integral cement concrete finish of specified thickness for floors & slabs shall be applied either monolithic or bonded as specified on the drawingly as per IS 2571. The surface shall be compacted & than floated with a wood float or power floating machine. The surface shall be tested with a straight edge & any high & low spots eliminated. Floating or trowelling of finish shall be permitted only after all surfaces water has evaporated. Dry cement or a mixture of dry cement and sand shall not be sprinkled directly on the surface of the cement finish to absorb moisture or to stiffen the mix.

v) Exposed Concrete finish/Rendering
A rubbed finish shall be provided only on exposed concrete surfaces as specified on the drawings. Upon removal of forms, all fins & other projections on the surfaces shall be carefully removed, off-sets leveled & voids & damaged sections be immediately saturated with water & repaired by filling with a concrete or mortar of the same composition as was used in the surface. Then surface shall be thoroughly wetted & rubbed with carborundrum or other abrasive. Cement mortar may be used in the rubbing, but the finished surface shall be brush coated with either cement grout after rubbing. The finished surfaces shall present a uniform and smooth appearance.

**Mode of Measurement**

i) The unit rate for concrete work under various categories shall be all inclusive & no claims for extra payment on account of such items as leaving holes, embedding inserts etc. shall be entertained unless separately provided for in the schedule of quantities. No extra claim shall also be entertained due to change in the number, position end/or dimensions of holes solts or openings sleeves, inserts or on account of any increased lift or scaffolding etc. All these factors should be taken into consideration while quoting the unit rates.

ii) Payments of concrete will be made on the basis of unit quoted for the respective items in the Schedule of Quantities. No deduction in the concrete quantity will be made for reinforcements, inserts etc. & opening less than 0.05 cu.m. where concrete is measured in cum. Where no such deduction for concrete is made, payment for shuttering work provided for such holes, pockets etc. will not be made.

iii) Payment for beams will be made for the quantity based on the depth being reckoned from the underside of the slabs & length measured as the clear distance between supports. Payment for columns shall be made for the quantity based on height reckoned upto the underside of slabs.

2.05 Providing and laying M20 concrete in superstructure.

General specification same as per item no. 2.04.

2.07 Providing and laying M 25 concrete up to above plinth level.

The general specification is same as per item no 2.04 but for the design mix M 25 instead of M20.

2.08 Providing and laying M 25 concrete in superstructure.

The general specification is same as per item no. 2.04 the design mix M25 instead of M20.

2.09 Providing & laying RCC for equipment/machine foundation

The general specification is same as item no 2.04 but for the mix of the concrete, which shall be as specified in the item. The rate is exclusive of reinforcement steel but inclusive of centering and shuttering, providing number of holes, pockets (size and as shown in the drawings/directed) and grouting the same after the machine/equipment is erected with concrete of specified mix and finishing the same as specified.

2.10 Supplying and mixing water proofing compound
The water proofing compound may be Fosroc, Sika, Cico or of any equivalent make. It shall be added to cement concrete or cement mortar as instructed by the Engineer. The proportion of the compound to be added shall be as per the Manufacturer's specifications.

Mode of Measurement

The quantity of compound added shall be measured and paid for. The unit shall be as specified in the item specification.

2.11 Providing, fabricating and placing in position Reinforcement steel

The quality of the steel shall be as mentioned in the materials section. The bars shall be fabricated as per the drawings. Laps & splices for reinforcement shall be as shown on the drawings. Splices in adjacent bars shall be approved by Engineer. The bars shall not be lapped unless the length required exceeds the maximum available lengths of bars at site.

Bending

a. Reinforcing bars supplied bent or in coils, shall be straightened before they are cut to size. Straightening of bars shall be done in cold and without damaging the bars. This is considered as a part of reinforcement bending fabricating work.

b. All bars shall be accurately bent according to the sizes & shapes shown on the detailed working drawings/bar bending schedules. They shall be bent gradually by machine or other approved means. Reinforcing bars shall not be straightened & rebent in a manner that will injure the material, bars containing cracks or splits shall be rejected. They shall be bent cold, except bars of over 32mm in diameter which may be bent hot if specifically approved by Engineer. Bars bent hot shall not be heated beyond cherry red colour (not exceeding 845 deg. C.) & after bending shall be allowed to cool slowly without quenching. Bars incorrectly bent shall be used only if the means used for straightening & rebinding shall not injure the material. No reinforcement shall be bent when in position in the work without approval whether or not it is partially embedded in hardened concrete. Bars having kinks or bends other than those required by design shall not be used.

Fixing

a. Reinforcement shall be accurately fixed by any approved means & maintained in the correct position shown in the drawings by the use of block, spacers and chairs as per IS 2502 to prevent displacement during placing and compaction of concrete. Bars intended to be in contact at crossing points shall be strongly bound together at all such points with two no. 16 gauge anhealed soft iron wire. The vertical distance required between successive layers of bar in beams or other members shall be maintained by providing of mild steel spacer bars at such intervals that the main bars do not perceptibly sag between adjacent spacer bars.
Cover

a. Unless indicated otherwise on the drawings, clear concrete cover for reinforcement (exclusive of plaster or other decorative finish) shall be as follows:

i) At each end of reinforcing bar, not less than 25 mm nor less than twice the diameter of the bar whichever is less.

ii) For a longitudinal reinforcing bar in a column, not less than 40mm, nor less than the diameter of the bar. In case of columns of minimum dimensions of 20 cm or under, with reinforcing bars of 12 mm and less in diameter, a cover of 25 mm may be used.

iii) For longitudinal reinforcing bars in a beam 25 mm nor less than the diameter of the bar.

iv) For tensile, compressive, shear, or other reinforcement in a slab or wall not less than 12mm nor less than the diameter of such reinforcement.

v) For any other reinforcement not less than 12 mm nor less than the diameter of such reinforcement.

vi) For footings and other principal structural members in which the concrete is deposited directly against the ground, cover to the bottom reinforcement shall be 75 mm. If concrete is poured on a layer of lean concrete the bottom cover may be reduced to 50 mm.

vii) For concrete surfaces exposed to the weather or the ground after removal of forms, such as retaining walls, footing sides & top etc. not less than 50 mm for bars larger than 16 mm dia and not less than 40mm for bars 16 mm dia or smaller.

viii) Increased cover thickness shall be provided, as indicated on the drawings, for surfaces exposed to the action of harmful chemicals (or exposed to earth contaminated by such chemical, acid, alkali, saline atmosphere, sulphurous smoke, etc.

ix) For reinforced concrete members, totally or periodically immersed in sea water or subject to sea water spray, the cover of concrete shall be 50mm more than those specified in (i) to (v) above.

x) For liquid retaining structures the minimum cover to all steel shall be 40mm or the diameter of the main bars, whichever is greater. In the presence of sea water & soils and waters of a corrosive character the cover shall be increased by 10 mm.

xi) Protection to reinforcement in case of concrete exposed to harmful surroundings may also be given by providing a dense impermeable concrete with approved protective coatings, as specified by the Engineer.

xii) The correct cover shall be maintained by cement mortar cover blocks. Reinforcement for footings, beams and slabs on sub-grade shall be supported on precast concrete blocks as approved by engineer. The use of pebbles or stones shall not be permitted.
Inspection

Erected & secured reinforcement shall be inspected, jointly measured & recorded & approved by Engineer prior to placement of concrete.

Mode of Measurement

Lengths of reinforcement steel shall be measured to the nearest centimeter. Spacers and chairs shall be measured & converted to weight using IS coefficients. The actual quantity of steel embedded in concrete as calculated & approved by Engineer, irrespective of the level or the height at which the work is done shall be taken. The unit rate for reinforcement shall include all wastages, binding wire, etc. for which no separate payment shall be made. Laps as shown in drawings or as approved by Engineer & minimum number of chairs & spacer bars required to keep the reinforcement in position shall be paid for. The cost of this quantity of steel plus wastage as specified in clause 5.0 of Section VI shall be recovered at issue rate from the Contractor. Rolling margin shall be paid as per clause 6.0 of Section VI.

2.12 Providing & placing in position bitumen impregnated fibers boards. The bitumen impregnated fiber boards shall be placed in locations before concreting as instructed by the Engineer. The work shall be done at all levels without any extra cost. The thickness of the board shall be as specified in the item specification.

Mode of Measurement

It shall be measured in sqm. The rate quoted shall be valid for all levels.

2.13 Providing and laying bituminous mastic

This shall be of approved make and quality. This shall be filled in the expansion joints as directed by the Engineer/shown in the drawings. The joints shall be of uniform width and care shall be taken for proper bonding of the joints.

Mode of Measurement

This shall be measured in RM for specified width and depths per the item in the Schedule of Quantities.

Clean-up

i) Upon the completion of concrete work, all forms, equipment, construction tools protective coverings and any debris resulting from the work shall be removed from the premises.

ii) All debris, i.e. empty containers, wooden pieces etc. shall be removed.

iii) The finished concrete surfaces shall be left in a clean condition satisfactory to Engineer.
2.14 Grouting the pockets with Ready mixed Grouting cement concrete mix of specified brand complete with making holes if necessary in concrete as directed. The work shall be measured based on the size of pockets actually grouted or size of pockets shown in the approved drawing, whichever is less. Similarly, in case of grouting below the base plate of machine / equipment, measurement shall be based on the area of grout and the thickness as per the drawing or as per actual whichever is less. 2.15 Providing & laying CC M20 in floor/road.

The general specification as per item no. 2.04

2.17 Precast concrete

Pre-cast concrete shall comply with IS 456 and with the following requirements:

a. All precast units shall be cast on suitable bed or platform with firm foundation and free from wind. Contractor shall be responsible for the accuracy of the level or shape of the bed or platform. A suitable serial number and the date of casting shall be impressed or painted on each unit.

b. Side shutters shall not be struck in less than 24 hours after deposition concrete and no precast unit shall be lifted until the concrete reaches a strength of at least twice the stress to which the concrete may be subjected at the time of lifting.

c. The lifting & removal of precast units shall be undertaken without shock, vibration or undue bending stresses to or in the units. Before lifting & removal takes place Contractor shall satisfy Engineer or his representative that the methods he proposes to adopt for these operations shall not over stress or otherwise affect seriously the strength of the precast units. The reinforced side of the units shall be distinctly marked.

d. All precast work shall be protected from the direct rays of the sun for at least 7 days after casting and during that period each unit shall be kept constantly watered or preferably be completely immersed in water if the size of the unit so permits, otherwise curing practice as given in clause 20 shall be followed.

e. Slots, opening or holes, pockets etc. shall be provided in the concrete work as shown in the drawings or as directed by Engineer. Any deviation from the approved drawings shall be made good by Contractor at his own expense, without damaging other work sleeves, bolts, inserts, etc. shall also be provided in concrete work where so specified.

g. Mode of Measurement

It shall be measured as per the item schedule. The unit rate for precast concrete members shall include formwork, mouldings, finishing, hoisting and setting in position including mortar, provision of lifting arrangement, exposed concrete finish etc. complete. Only if reinforcement is used, it shall be measured and paid for separately under item rate.
2.18 Making holes in old/new concrete by drilling of required diameter & depth as per detail & directed, anchoring steel bars in drilled hole properly of required length & diameter, grouting with epoxy chemicals such as “Fischer” fixing system, Forsoc, sico or equivalent as per detail & directed.

[a] 8 mm Tor steel bar  
[b] 10 mm Tor steel bar  
[c] 12 mm Tor steel bar  
[d] 16 mm Tor steel bar  
[e] 20 mm Tor steel bar  
[f] 25 mm Tor steel bar

2.19 Providing & applying concrete bonding compound to old & new concrete surfaces after necessary chipping & cleaning surface dust free. The bonding agent/compound shall be FOSROC, SICO, CANBEXTRA., or equivalent make confirming to IS as per manufacturer’s specifications and detailed drawing. at all levels, in vertical & horizontal planes as directed by site engineer.

2.25 Providing & mixing plastisizer of approved make such as Pidilite, Sico, Fosroc or S.T.P. as per detail and instruction of site engineer.

2.26 Providing & Laying 25mm x15 mm deep polysulphide sealing compound of FOSROC, PIDILITE or equivalent make confirming to IS as a filler material as per manufacturer’s specifications and detailed drawing. In expansion joints at all levels, in vertical and horizontal planes.

SECTION 3.00 MASONRY WORKS

Applicable codes and specifications

a. The following codes, standards & specifications are made a part of this specification. All standards, tentative specifications, codes of practices referred to herein shall be the latest edition including all applicable official amendments and revisions.

IS:1077 - Common burnt clay building bricks  
IS:3102 - Classification of burnt clay bricks  
IS:2180 - Burnt clay building bricks, heavy duty  
IS:3495 - Method of sampling and testing clay building bricks  
IS:2691 - Burnt clay facing bricks  
IS:2221 - Code of practice for brick work  
IS:2185 - Load bearing hollow concrete blocks  
IS:5498 - Lime-cement-cinder hollow concrete blocks  
IS:3115 - Lime-cement cinder soiled blocks  
3.01 Providing and constructing brick masonry in CM in foundation & upto plinth level

a. Bricks used in works shall be bricks of specified crushing strength as described in the Schedule of Quantities. They shall have the following general properties:

They shall be sound, hard, homogenous in texture, well burnt in kiln without being vitrified, table molded, deep red, cherry or copper colored, of regular shape and size free from pores, chips, flaws or humps of any kind. Bricks containing unground particles and which absorb water more than 1/5th of their weight when soaked in water for twenty four hours shall be rejected. Over burnt or under burnt bricks shall be liable to rejection. These bricks shall give a clear ringing sound when struck.

b. Samples of bricks shall be submitted before starting the brickwork to the Engineer for approval. Bricks supplied shall conform to these approved samples. Brick sample shall be got tested as per IS:3495 by Contractor at no extra cost. Bricks rejected by Engineer shall be removed from the site of works within 24 hours.

(c) Mortar

i) Mix for cement mortar shall be as specified in the respective items of work. Gauge boxes for sand shall be of such dimensions that one complete bag of cement containing 50 kgs. of cement forms one unit. The sand shall be free from clay shale, loam, alkali & organic matter & of sound, hard, clean and durable particles. Sand shall be approved by the engineer. If so directed by the engineer sand shall be thoroughly washed till it is free of any contamination.

ii) For preparing cement mortar the ingredients shall first be mixed thoroughly in dry condition. Water shall then be added and mixing continued to give a uniform mix of required consistency. Cement mortar shall preferably be machine mixed, through mixing in a thorough manner may be allowed. The mortar so mixed shall be used within 30 minutes of mixing. Mortar left unused in the specified period shall be rejected.

iii) The Contractor shall arrange for test on mortar samples if so directed by the engineer retemping of mortar shall not be permitted.

(d) Workmanship

i) All bricks shall be thoroughly soaked in clean water for at least one hour immediately before being laid. The cement mortar for brick masonry work shall be as specified in the respective item of work. Brick work 230 mm thick and over shall be laid in English bond unless otherwise specified. While laying bricks shall be pressed in to the mortar and shoved into final position so as to embed the brick fully in mortar. Bricks shall be laid with frogs uppermost.

ii) All brick work shall be plumb, square & true to dimensions. Vertical joints in alternate courses shall come directly one over the other & be in line. Horizontal courses shall be leveled. The thickness of brick courses shall be kept uniform. For walls of thickness greater than 230mm both faces shall be kept in vertical planes. No broken bricks shall be used except as closers. Care shall be taken that the bricks forming the top corners & ends of the wall shall be properly radiated & keyed into position. Holes kept in masonry for scaffolding shall be closed before plastering. All interconnected brickwork shall be
carried out at nearly one level (so that there is uniform distribution of pressure on the supporting structure) & no portion of the work shall be left more than one course lower than the adjacent work where this is not possible, the work shall be raked back accordingly to bond (& not saw toothed) at an angle not exceeding 45 deg.

iii) Bricks shall be so laid that all joints are well filled with mortar. The thickness of joints shall not be less than 6mm and not more than 10 mm. The face joint shall be raked to a minimum depth of 12mm by raking tools daily during the progress of work when the mortar is still green so as to provide a proper key for the plaster or pointing to be done. Where plastering or pointing is not required to be done the joints shall be uniform in thickness and be struck flush and finished at the time of laying. The face of brickwork shall be cleaned daily and all mortar droppings removed. The surface of each course shall be thoroughly cleaned of all dirt before another course is laid on top. If the mortar in the lower course has begun to set the joints shall be raked out to a depth of 12 mm before another course is laid.

iv) All brick work shall be built tightly against columns, floor slabs or other structural member.

v) Where drgs. indicate that structural steel columns are to be fireproofed with brick work the brick shall be built closely against all flanges and webs with all spaces between the steel and bricks works filled solid with mortar. Steel members partly embedded in brickwork and not indicated to be fireproofed with concrete shall be covered with not less than 12mm thick mortar unless directed otherwise by engineer.

vi) The work shall be cured for 15 days.

(e) Miscellaneous inserts in masonry e.g. sleeves, wall ties, anchors, conduits, structural sheet, steel lintels etc. shall be installed by the Contractor. Furnishing fixing of any of these inserts by the Contractor will be paid for separately under steel work. Openings, arches, etc. shall be provided as shown on the drawings, chasses, pockets etc, shall be provided as shown on the drawings to receive rain water pipes etc. Wall ties and flashings shall be built into the brickwork in accordance with the drawings and specifications.

(f) Mode of Measurement

i) Brick work of thickness one brick i.e. 230 mm & above shall be paid in units of cum. In all cases, the quantities measured shall be executed after asking necessary deductions for openings etc. as given below:-

No deductions shall be done for openings upto 1000 sqcm, ends of dissimilar materials, drainage holes, window/door holdfasts, concrete lintel bearings, landing slab bearing, beam bearing, chimney flues, cutouts, iron fixtures, pipes upto 30cm dia.

ii) It shall be clearly understood that the rates quoted by the Contractor include leaving openings, cutting chases in brickwork as per drawings/ instructions of the Engineer.

iii) The rate includes necessary single or double scaffolding, centering, soaking of bricks, raking out joints and curing the work all complete.
3.02 Providing and brick work in CM in super structure at all levels

The general specification is same as per item no. 3.02.

3.03 Providing and constructing 115 mm brick masonry in partition for superstructure in CM

The bricks shall be laid with stretchers. The proportion of the mortar shall be as specified in the item description. The quality of the bricks shall be as specified in the item 3.01. The bricks shall be well soaked in water before using them. The brick work shall be plumb and square. Two nos. of 6mm dia MS bars or 25mm x 1.2 mm deep iron band kept at every third course of 115 mm thick brick work. This shall be provided by the Contractor.

Mode of Measurement

The brick work shall be measured in sq.m. The deductions shall be as specified in the item 3.01. The rate includes necessary single or double scaffolding, centering, soaking of bricks, providing and placing of 2 nos of 6 mm dia MS bars or 25mm x 1.2 mm deep iron band, raking out joints and curing the work all complete.

3.04 Providing and constructing honey comb brick work

The specification for the material and the workmanship shall be as specified in the items 3.01 or 3.03 depending on the thickness of the brick work. The proportion of the CM shall as specified in the item description in the Schedule of Quantities.

Mode of Measurement

It shall be measured as a normal brick work. No deductions shall be made for the honeycombing. Also nothing extra shall be made for the honeycombing.

SECTION 4.00 WOODWORK

Applicable Codes

IS:4021 - Timber door, window and ventilator frames
IS:2202 - Wooden flush door shutters (solid core type) part I
IS:1003 - Timber panelled and glazed shutters (part I & II)
IS:4020 - Method of tests for wooden flush doors: Type tests.
IS:1761 - Transparent sheet glass for glazing and framing purposes
IS:3097 - Specification for veneered particle boards (Exterior Grade)

4.01 Providing & Fixing panelled or glazed or partly panelled & partly glazed door shutters of specified thickness with frame of specified size
a. Wood used for all work shall be the best of the respective class specified & properly seasoned, suitable for joiner work should be of natural growth, uniform in texture, straight grained, free from sapwood, dead knots, open shakes, rot, decay and any other defects and blemishes.

b. For joints following principles to be observed:

At the joints the weakness of pieces must be minimum as far as possible. To place each abutting surface in a joint as neatly as possible, perpendicular to pressure. To form and fit accurately every pair of surface that come in contact.

c. All joining shall be wrought on all faces and finished off by hand with sand paper with slightly rounded arises.

d. The joints shall be pinned with hard wood pins and put together with white lead. Jointing shall be by means of mortice and tenon or dovetailed joints as approved. For external work the joints shall be coated with white or red lead before the members are put together. For internal joints where there is no chance of moisture the joint shall be glued. Driving of screws with hammer is prohibited The screws shall be soaked in oil before driving them home. The heads of the screws and nails shall be sunk and putti

e. Any joinery work which shall split, fracture, shrink or show flaws or other defects due to unsoundness, inadequate seasoning or bad workmanship, shall be removed and replaced with sound materials at the contractor's expense.

f. Door frames shall be rebated. All dimensions shall be as per drawings. The verticals of door frames shall project about 50mm below finished floor. surface coming in contact with brick work shall be painted with bitumen or solignum as directed by the engineer. The door frame shall be provided with 3 nos MS 230x30x3 mm flat split hold faster on each side, respectively. These hold faster shall be embedded in masonry or concrete work with concrete block of mix 1:2:4 and size 230x300x250. The work shall conform to IS:4021.

g. The door shall be paneled or solid flush doors as described in the item of work. All doors shall be supplied with approved fittings such as hinges, mortice lock of approved make with handles on both sides, oxidized brass tower bolts & latch arrangements door stops etc, and as shown in drawings. External flush doors shall be made of weatherproof plywood as per item description in the Schedule of Quantities.

h. The workmanship of all doors & window shutters shall conform to the requirements of IS:1003 (Parts 1 & II) & IS:2202 (Part 1). Flush door panels shall be got tested as per IS:4020 in standard Laboratories.

i. Beading and architraves shall conform to the shapes shown on drawings or as approved and fixed by means of screws (counter sunk or otherwise) or bolts.

j. Glass

Sheet glass or plate glass shall be of Indian make as specified in the Schedule of Quantities/ as directed. It shall be free from waves and bubbles and all defects The thickness of the glass shall be as follows:-

2mm thick glass for panes upto 900 sqcm area
3mm thick glass for panes from 900 - 5500 sqcm area

4mm thick glass for panes 5500-8400 sqcm area

5.5mm thick glass or plate glass for panes above 8400 sqcm

It should be clearly understood that glass which does not have uniform refractive index or which is wavy, will be rejected. The glazing shall be fixed with teak wood beading and putty.

It shall conform to IS:1761. The putty shall be made up of one part of white lead, 3 parts of finely powdered chalk and adding boiled linseed oil to make a stiff elastic paste. No voids shall be left in the putty. Woodwork shall not be painted oiled or otherwise treated before it has been approved by the engineer.

k. Mode of Measurement

The doors shall be measured in sq.m. or part thereof. The outer to outer of the door shutter shall be measured. The rate for the item shall include the following works :-

i) Providing and fixing of the shutter as specified and instructed by the Engineer

ii) Providing and fixing of architrave as per drawing.

iii) Painting / polishing of the shutter and the architrave/beading

vi) Fittings shall be provided as specified in the item / as per the drawings/as directed.

V) Providing & fixing of glass of specified thickness with painted/polished teak wood beading/putty etc. all around.

4.02 -Do- same as per item 4.01 but for 19 mm NOVA TEAK paneled or equivalent make board as filler material.

The specification shall be same as for item 4.01 but for NOVA TEAK or the board of ISI approved make.

4.03 -Do- same item 4.02 but without frame

The specification shall be same as item 4.01 but the measurement of the actual size of the shutter shall be taken.

4.04 Providing and fixing Composite door and window partly openable, partly fixed with frame of specified size.

The specification for the door shutter shall be as per item 4.01. The specifications for the windows shall be as given below:-

The window frame shall be provided with 2 nos MS 230 x 30x 3mm flat split hold fasts on each side, respectively. These hold fasts shall be embedded in masonry or concrete work with concrete block of mix 1:2:4 and size 230x300x250 mm.

The type of windows shall be as specified. Each leaf of the shutter shall have one pair of hinges for a width of less than or equal to 2 feet, for width more than 2 feet extra nos. of hinges shall be provided as directed by the Engineer at no extra cost. The glazed
windows shall be provided with glass of thickness as specified in the item description. Architraves shall be provided as per drawings.

Mode of Measurement

Same as item 4.01.

4.05 Providing and fixing windows and ventilators fixed type

The specification for windows shall be same as given in item 4.04. Ventilators shall have two MS holdfasts. Ventilators shall be provided with glass of thickness as specified in the item description. Architraves for the ventilator shall be provided as per the drawing. Mode of measurement shall be same as item 4.04.

4.06 -Do- same as item 4.05 but for fully openable type

The specification shall be same as item 4.05 but with necessary hinges as per item description / drawing. The work shall be carried out as per the drawing/ as instructed by the Engineer.

4.07 -Do- same as item 4.05 but for partly openable and partly fixed

The specification shall be same as item no. 4.05 but with necessary hinges as per item description / drawing.

4.08 Providing & Fixing mosquito/fly proof shutter

The specification for frames and the shutter shall be same as item description and for the fly wire mesh the following specification shall be applicable:

Fly/Mosquito proof netting of 100G or 140G (22 to 23 SWG), rust proof, galvanized as specified in the item description shall be used. Mosquito proof of 100 G (23 SWG), 0.60mm wire dia and 1mm average distance between the wire or Fly proof of 140 G (22SWG), .71mm wire dia and 1.40mm average distance between the wire shall be used.

Mode of Measurement

The wire mesh shutter shall be measured in sqm. The wiremesh Bent up or turned back shall not be paid, only shutter out to out shall be paid. The rate shall include painting/polishing of both sides of the shutter and the beading provided all around the wire net as specified in the item description.

4.09 Providing & Fixing fixed glass louvers in TW frame of specified size

The frame shall be fixed to the masonry or RCC elements with 2 nos hold fasts. The louver shall be provided with glass of thickness as specified in the item description. The glass shall be fixed at an angle in the frame as shown in the drawing. The frame shall be painted/polished as specified in the item description.

Mode of Measurement

It shall be measured in sqm. The outer to outer of the frame shall be measured. The rate shall include providing of frame, architrave, glass louvers, painting/polishing etc. all complete.
4.11 Providing & fixing built in cupboard

These shall be made of block board / particle board as specified in the item description. The shutter shall also be made of 19 mm or 25 mm thick block board or particle board or marine ply as specified in the item. 6mm thick and of suitable width teak wood lipping shall be provided on all edges. Horizontal partitions shall be provided as per the drawings/ instructions. The size of the frame shall be as specified in the item description. The inside shall be painted with paint of ISI approved make and exterior shall be painted / polished as specified / directed.

Mode of Measurement

It shall be measured in sq.m. The outer to outer of the frame shall be measured. The rate shall include provision of frame shutter, horizontal and vertical partitions, beading and painting / polishing all complete.

4.12 Providing and Fixing Meter box cupboard on wall

The frame shall be of specified size and class of wood. It shall be fixed with 2 no. of holdfasts and the same may be grouted with CC 1:2:4 blocks of size 230x230x300. The shutter shall be of 19 mm thick Nova teak. A slit shall be provided in the shutter as directed by the Engineer. 3mm thick glass shall be fixed in the slit. Architraves shall be provided as directed by the Engineer. Fixtures as specified shall be provided. The shutter, frame and the architrave shall be painted with 3 coats of ISI approved enamel paint.

Mode of Measurement

It shall be measured in sq.m. The outer to outer of the frame shall be measured.

4.13 Providing and fixing TW baluster (molded hand rail)

The hand rail shall be of specified quality of teak wood. The size, shape and the design shall be as per the Architect’s drawing. The rounding at the landing shall be made up of monolithic one piece. The hand rail shall be fixed on MS flats with screws/anchor bolts as specified. It shall be applied with three coats of paint/polish as specified.

Mode of Measurement

It shall be measured in cum or part thereof. Measurement shall be for the rectangle or square cross-section circumscribing the curve ends and the actual length.

4.14 Extra for making vision panel/Venetian in flush door.

These shall be provided as shown in the drawings. The inside of the opening shall be lipped. The glass shall be braced with beading and putty. The lipping and the architrave shall be painted with 2 coats of approved paint or polished as directed. Opening up to 0.259 sqm shall not be deducted from the shutter area for payment.

Mode of Measurement

It shall be measured in nos.

4.15 Providing and Fixing cupboard below platform
TW frame of specified size and class of wood shall be provided. The shutter shall be of 19mm thick block board/particle board/marine ply shutter as specified. The frame and both the sides of shutter shall be duly painted as directed. Architrave shall be provided as specified and the same shall be painted as directed.

Mode of Measurement

It shall be measured in sqm. The measurement shall be out to out of the frame.

SECTION 5.00 FINISHING WORKS

Applicable Codes

IS:1477 - Code of practice for painting of ferrous metals in buildings & allied finishes (part I & II)
IS: 427 - Distemper, dry colour as required
IS:2395 - Code of practice for painting concrete, masonry and plaster surfaces
IS:428 - Distemper, oil emulsion, colour as required.

5.01 Providing & Applying Cement plaster 12 mm thick

The surface to be plastered shall be washed with fresh clean water free from all dirt, loose material grease etc. and thoroughly wetted for 6 hours before plastering work is commenced. Concrete surfaces to be plastered will however be kept dry. The wall should not be too wet but only damp at the time of plastering the damping shall be uniform to get uniform bond between the plaster and the wall. The junction between the brick work and RCC should be fixed with chicken wire mesh/PVC strip as directed before plaster.

The proportion of the mortar shall be as specified under the respective items of work. Cement shall be mixed thoroughly in dry condition and then just enough water added to obtain a workable consistency. The quality of water, sand and cement shall be as mentioned in the Specifications for Concrete & allied works. The mortar thus mixed shall be used immediately and in no case shall the mortar be allowed to stand for more than 30 minutes after mixing with water. The plaster shall be laid in a single coat. The mortar shall be splashed on the prepared surface with a trowel and finished smooth by trowelling. The plastered surface shall be rubbed with iron plate till the surface shows cement paste. The work shall be in line and level. Curing of plaster shall be started as soon as the applied plaster has hardened enough so as not to be damaged. Curing shall be done by continuously applying water in a fine spray and shall be carried out for at least 7 days.

The plaster shall be carried out on jambs, lintel and sill faces top and undersides, etc. as shown in the drawing or as directed by the engineer.
Mode of Measurement

a. The quantity of work to be paid for under this item shall be calculated by taking the projected surface of the area plastered after making necessary deductions for openings, doors, windows etc. as given below:

i) No deductions shall be made for opening or end steel joints, beams, post girders etc. upto 0.5 sqm area. No addition shall be made for joints, soffits and sills of such openings. This is applicable to both the sides of the wall.

ii) Where opening exceeds 0.5 sqm. but does not exceed 3 sqm & also when only one side of the wall is treated and other side is not treated, deduction shall be made if the width of the reveal on the treated sides is less than that on the untreated side but if the width of the reveal is more then no deduction nor addition shall be made for reveals for jambs, soffits, sills etc.

iii) For openings more than 0.5sqm but not exceeding 3 sqm & also when both the sides of the wall is plastered with the similar plaster, deduction shall be made for one face only. But when both the sides treated with different plaster, then deduction shall be made from the side on which the reveal is less and no deduction on the other side.

iv) For openings whose respective areas exceed 3 sqm deduction shall be made for the full opening of the wall treatment on both faces while at the same time jambs, sills and soffits shall be measured in sqm for payment. In measuring the jambs deduction shall not be made for the area in contact with the frames of doors, windows etc.

v) If the average thickness of the plaster is more than the specified thickness due to any account nothing extra shall be paid for the same.

vi) Nothing extra shall be paid for double scaffolding and the rate is applicable for work at all levels.

5.02 Providing & Applying cement plaster 20 mm thick. The General specifications as same for item no. 5.01 but for the thickness of the plaster. The plaster work shall be carried out in 2 layers, the first layer being 12-14mm thick and the second layer being 6-7mm thick. The proportions of the mortar for both the layers shall be as specified in the item specification. The first layer shall be splashed against the prepared surface with a trowel to obtain an even surface. The second layer shall then be applied and finished leaving an even and uniform surface, trowel finished unless otherwise directed by the engineer. The plastered surface shall be rubbed with the iron plate till the cement plaster comes on the surface.

Mode of Measurement

It is same as specified in item 5.01.
5.03 Providing & Applying lime punning to the plastered surface.

The plastered surface shall be finished smooth by trowelling on the surface with lime Neeru (lime cream). Neeru shall be properly slaked flat time. The neeru shall be applied at the rate of 2.2 Kg per sqm.

Mode of Measurement

It shall be measured in sq.m. The rate shall include the cost of lime, double scaffolding, finishing and curing the work at all levels. The deduction as mentioned in item 5.01 shall be applicable here also.

5.04 Providing and Applying 19mm sand faced plaster

a. This shall be applied in 2 coats. The first coat or the base coat should be approximately 12 mm and shall be continuously carried out without break to the full length of wall or natural breaking points such as doors, windows etc. The base coat shall be splashed on to the prepared surface with heavy pressure, brought to true and even surface and then lightly roughened by cross scratch lines, to provide bond for the finishing coat. The mortar proportion for this base coat shall be as specified in the respective item of work. The base coat shall be cured for at least seven days.

b. The second coat shall be 6mm thick. Before application of the second coat, the base coat shall be evenly damped. This coat shall be applied from top to bottom in one operation and without joints, finish shall be straight, true and even. The mortar proportions of this coat shall be as specified under the respective item work. Sand to be used for the second coat and for finishing work shall be as specified in the item description. The second coat shall be finished with sponge. Grooves shall be made as per the drawings.

Mode of Measurement

It shall be same as per item 5.01.

5.05 Providing & Applying water-proof cement plaster

The plaster shall be of specified thickness and of mortar proportions. The contractor shall use approved waterproofing admixture made by reputed manufacture in the mortar for plaster work. The quantity to be used shall be accordance with the manufacturer's instructions, however subjected to the approval of the Engineer. The use of Calcium chloride shall be prohibited unless specifically allowed by engineer and shall conform to IS:2645. The plaster shall be cured at least for 7 days.

Mode of Measurement

It shall be measured in sqm. The rate shall include the double scaffolding, plastering & curing. The cement of water-proofing material added shall be measured & paid for separately.
5.06 Providing & Applying neat cement neeru.

The specification same as per item no.5.03 except that neat cement is applied to the plaster surface in place of lime neeru.

5.07 Providing & Applying white washing on new work 3 or more coats Walls to be thoroughly scrapped with sand paper before white wash is applied. White wash shall be prepared from a good quality fat lime. Lime shall be slaked with water to the consistency of a cream and allowed to remain under water for 2 days. It shall then be strained through a cloth and 2 kg of clean gum of approved make, as specified in the item specification or by the engineer, shall be added for every cubic meter of lime and indigo upto three gm. per kg of lime dissolved in water shall then be added and stirred well.

Each coat to be applied with a brush. It shall be applied with a stroke of the brush from the top downwards, another from bottom upwards over the first stroke and similarly one stroke on the right and another from the left over the first brush, before it dries. Minimum 3 coats shall be applied on the plaster surface for desired finish. If the desired finish is not obtained extra coats shall be applied without any extra cost.

Mode of Measurement

It shall be measured in sqm. Deductions shall be carried out as per item no.5.01. The rate shall be applicable for carrying out the work at all heights, double scaffolding etc. all complete. Extra 20% shall be added to the area for AC corrugated sheets and 17% for semi-corrugated sheets, Cornices and others.

5.08 Providing and fixing Chicken wire mesh.

The wiremesh shall be 24 gauge and it shall be fixed with nails at the junction of brick masonry and RCC elements the chicken wiremesh shall not sag in between the nails. This shall be done before the application of plaster.

Mode of Measurement

It shall be measured in sqm. Measurement shall be taken before the application of the plaster. The rate includes for carrying out the work at all heights.

5.10 Providing & Applying Plastic Emulsion paint

SECTION 6.00 FLOORING

Application Code

IS : 2114 - Code of practice for laying in situ terrazzo floor finish
IS : 777 - Glaze earthenware tiles
6.01 Providing & Fixing precast Mosaic tile flooring

The type, quality, size, thickness, colour etc. of the tiles for flooring shall be as per the item description given in the Schedule of Quantities and of best quality. The contractor shall provide the Engineer with necessary sample for approval.

Before the tiling work is commenced, the sub-surface shall be thoroughly cleaned and washed of all loose material, dirt, and surface. The tiles shall be laid on cement mortar or lime mortar bedding of thickness and proportion as specified in the item description. The mortar shall be evenly spread on the sub-floor. Over this mortar bed, 4.4 kg of cement per sqm of floor area shall be spread. The tiles shall be fixed on this bed one after another. Each tile being gently tapped with a wooden mallet till it is properly bedded and in level with the adjoining tiles. The joints shall be perfectly straight and uniform in thickness. The tiles shall be laid perfectly in level unless otherwise specified by the Engineer. After laying the tiles the joints shall be finished with white cement or ordinary cement as specified.

For lime mortar bedding lime from burnt stone shall be used. It shall be free from ash and impurities and be in the form of lumps and not powder when brought to site, lime which is damaged due to rain, soaking, moisture or air slaking shall be rejected.

Floor tiles laid adjoining the wall shall project 12mm or as specified under the plaster, skirting or dado as directed by the Engineer. Half tiles and pieces shall be avoided as far as possible. After laying the tiles, it shall be cured for at least 14 days. About a week after laying the tiles each and every tile shall lightly tapped with a small wooden mallet to find out if it gives a hollow sound, if it does, such tiles along with any other cracked or broken tiles shall be removed and replaced with a new tile to proper line level. The same procedure shall be followed again after the tiles are finally polished. The purpose of ensuring that such replaced tiles match with those earlier laid it is necessary that the Contractor order enough extra tiles from the factory to meet this contingency. The tiles shall finally be cleaned and polished by using dilute oxalic acid or any other method recommended by the manufacturer and approved by the Engineer.

After the joints have attained sufficient strength, the floors shall be machine polished to the desired finish approved by the Engineer. Sufficient quantity of water shall always be used during polishing to prevent scratches.
Mode of Measurement

Unit of measurement for floor tiling shall be sqm or part thereof of the superficial area. Actual quantity of tiling work carried out shall be measured and paid for after making deductions for openings etc. The rate shall include the cost of tiles including wastage, laying as per specifications, curing, polishing etc. all complete.

6.02 Providing & Fixing precast Mosaic tiles in skirting, dado and risers

For dado and skirting work, the vertical surface shall be thoroughly cleaned and wetted. Thereafter it shall be evenly & uniformly covered with about 12mm thick 1:3 cement mortar. For this work the tiles as obtained from the factory shall be of the size required & practically fully polished. The back of each tile to be fixed shall be covered with a thin layer of neat cement paste and the tile shall then be gently tapped against the wall with a wooden mallet. This shall be done from the bottom of the surface upwards. The joints shall be as close as possible and the work shall be truly vertical and flush. The tiles shall be fixed flush with the plaster or projected as specified by the Engineer. The junction of the plaster and the skirting or dado shall be neatly finished. The joints shall be filled with ordinary cement unless otherwise specified. After the tile has set, hand polishing with carborundum stones shall be done so that the surface attains a glossy finish. Corners and junctions be finished true.

Mode of Measurement

Skirting, dado or risers shall be measured in rmt or part thereof. The rate shall include providing tiles including wastage, laying as per specifications, filling joints, curing, rubbing and polishing etc. all complete.

6.03 Providing & Laying cast-in-situ Marble chips flooring

The marble chips shall be of approved size, colour & shade. The cement used may be white cement or cement mixed with coloring pigments as directed by the Engineer. The proportion of marble chips to cement shall be as specified in the item description, but in no case it shall be less than 2:5:1. Samples of terrazzo / mosaic work shall be prepared for approval of Engineer. The entire work shall conform to the approved samples. The terrazzo chips shall be laid after placing the base. The base shall consist of a layer of 28 mm thick 1:2:4 cement concrete (1 cement, 2 coarse sand, 4 19mm & down graded stone aggregate) spread & leveled. While laying the flooring, dividing strips of glass/PVC/aluminum of specified thickness shall be inserted in the mortar bed according to the design of the floor. Care being taken to see that no panel exceeds 1.5 sq.m. in area. The top of strips shall be 10mm above the surface of the under bed & shall conform to the finished level of the floor. Chips shall be thoroughly mixed dry & then white cement or cement of approved colour shall be added in mixed & evenly spread on the platform & not heaped. Water shall then be added to obtain a plastic mix of suitable consistency as directed by the Engineer. Terrazzo sufficiently but in no case than the day thereafter. The thickness of terrazzo topping shall not be less than 10mm. The surface shall be rammed to obtain the consolidation & leveled surface. Additional chips shall be sprinkled on the surface and rammed in until surplus cement is checked out & chips forced together so that the finished floor will show not less than 70% aggregate. The surface is finally trowelled lightly. The Contractor shall keep the floor moist for not less than seven days. The surfaces neat grouting of same kind and colour as matching. This grouting shall remain at least 72 hours before being removed for
final cleaning. The floor shall be refinished wherever necessary to leave the work in first class condition.

Mode of Measurement

This shall be measured in sq.m. The rate shall include providing and laying marble chips flooring with dividing strips, curing, machine /hand polishing. This item shall also be applicable for flooring in landings, kitchen platform etc.

6.04 Providing and Laying cast-in-situ- marble chips in skirting and dado.

The height of the skirting/dado shall be as per the drawing. The cast layer shall be 12mm cement mortar of 1:3 proportion (1 cement, 3 coarse sand) and top 7 mm thick layer shall be of approved marble chips in proportion 1:2 (1 cement, 2 marble chips). While laying the skirting / dado glass strips of specified width shall be provided. The skirting/dado shall be flush with the plaster or projected as specified by the Engineer. The junction between the skirting/dado and the plaster shall be finished properly. The skirting/dado shall be hand polished.

Mode of Measurement

It shall be measured in sq.m. The rate shall include providing and laying marble chips in skirting/dado, dividing strips, curing, rounding off the corners of the floor and the skirting, hand polishing, cleaning etc.

6.05 Providing & Laying polished green kotah stone flooring

Stone shall be of approved quality, size and uniform thickness, edges shall be chisel dressed and the top surface shall be machine polished with joints running true and parallel from side to side. Stones should be laid on a bed of cement of lime mortar. The pattern of the flooring shall be as per the Architect’s drawing. Thickness of mortar bedding shall be as specified in the item specification. The Stone slabs shall be thoroughly wetted with clean water. Neat cement shall be spread over the mortar bed and the slabs shall be placed one by one, Keeping in check the level and line of the flooring. The slabs are then gently tapped with wooden mallet till it is firmly and properly bedded. There should be no voids left. The joints should not be more than 2 mm thick. The joints should be struck smooth. If specification terrazzo filling of specified thickness shall be done in the joints between the kota stone slabs. The floor should be kept covered with damp sand or water for a week. Stone should be of sizes as specified. The stone shall be machine polished and then cleaned with oxalic acid. If the contractor is asked to mop the floor with kerosene and water be the engineer, the same be done without any extra cost. The shall be carried out at least for 10 times 7 days.

Mode of Measurement

This shall be measured in sq.m. The rate shall include providing and laying, Curing, machine polishing, cleaning etc. all complete.
6.06 Providing and laying kota stone in skirting & dado

The stone shall be of required sizes and the thickness shall be as mentioned in the item specification. The stones shall be pre-polished and machine cut. The stone's edges shall be dressed fine true, straight and at right angles to each other. The stones shall be fixed over cement mortar bed 1:4 (1 cement : 4 coarse sand). The joints are filled with ordinary cement and its hand and wax polished. The joint between the top of skirting/dado and plaster shall be continued in the skirting/dado also. The work shall be cured properly.

Mode of measurement.

This shall be measured in rmt. If mopping of the Kota stone is asked to be carried out instead of wax polishing the same be carried out without extra cost.

6.07 Providing & laying Pre-polished, machine cut kota stone in treads

Polished green kota stone of specified thickness with machine cut edges shall be fixed for treads of steps in single piece or on the kitchen platform or open shelves trades & risers and window sills as directed. The stones shall be hand and wax polished. The laying procedure is same as specified in the item 6.02 above. Curing shall be done properly.

Mode of measurement.

Measurement shall be in sqm of the stones laid. If mopping of the kota stone is asked to be carried out instead of wax polishing the same shall be done continuously for ten days description in the schedule of Quantities.

6.09 Providing & Fixing kotah stone shelves

The stones shall be pre-polished on both the sides and the thickness shall be 25 to 30mm. The stones shall be placed in the brick masonry zarrries and the same shall be finished properly.

Mode of Measurement

This shall be measured in sqm. The rate shall include providing kotah stones, cutting zarrries, placing the shelves, filing zarrries, propping them till the CM sets and curing all complete.

6.10 Providing & laying rough chiselled kotah stone flooring.

The stones shall be of specified thickness and size. The stones shall be placed on 20 thick CM bedding or lime mortar bedding and the joints shall be with CM 1:2 (1 cement, 2 stone dust). The joints shall be finished flush or with "V" grooves of 5 to 8 mm wide & 8 mm deep. The slope shall be maintained as given in the drawing or as directed.

Mode of Measurement

This shall be measured in sqm. The rate shall include providing and laying of stones, finishing of joints etc. all complete.
6.11 Providing & Laying 40mm thick IPS flooring

The mix shall be 1 part cement, 2 parts coarse sand and 4 parts graded stone aggregate. The flooring shall be laid in panels of uniform sizes nor exceeding 2 sqm. They shall be laid in alternate panels on alternate days. The edges shall be protected properly. Glass/PVC/aluminium strips shall be provided to separate the panels, as per the item description in the schedule of Quantities. The Slope shall be maintained as directed by the engineer.

The mix shall be prepared by volumes. Mixing shall be done in mixers. The concrete shall be placed in position and levelled up with the help of wooden straight edge and trowel and beaten up well till slurry comes on top and holes filled up with concrete.

If IPS had to be laid directly on RCC slab, the surface of the RCC slab shall be roughened up with brushes while the concrete is green. Before laying the flour, the laitance, loose materials, cake of mortar dropping shall be removed and the surface of the slab hacked and coat of cement slurry @ 2.75 kg of cement per sq.m. shall be applied so as to get a good bond between the slab and IPS. IPS has to provided on lean concrete no slurry as required.

The flooring shall be finished with 25 mm thick (1:1) cement-sand mortar and cement slurry @2.2 kg of cement per sq.m and water shall be applied on top with wooden float till the voids in the concrete are filled with mortar cream. The surface must be uniform and even in colour. Dry cement of cement sand mixture shall not be sprinkled to absorb excess moisture in the flooring. The top of flooring chequered with 9 mm thick grove at 75mm x 75mm groove or as directed. Colour pigments shall be added to flooring if instructed by the engineer. Curing shall be done for seven days. The edges of the panels shall be protected from damage.

Mode of Measurement

The flooring shall be measured in sq.m. The finishing plaster is included in the IPS flooring item and shall not be measured separately. The rate shall include providing and laying IPS flooring, finishing the work, curing, rounding of the edges between the wall and skirting, chequering etc complete.

6.12 P & L IPS flooring of 50 mm thick

-DO- same as item 6.11 but for 50mm thick

6.13 P & L IPS flooring of 75 mm thick

-DO- same as item 6.11 but for 75 mm thick
6.13 Providing & laying 75 mm thick vacuums dewatered surface vibrated & finished with trimix machine with controlled grade i.e. M20 RCC for industrial floor slab with 8 mm diameter steel reinforcement @ 250 mm c/c (both ways) placed on concrete chairs on upper third of the concrete slab formation of construction joints @ 6mm c/c by cutting up to 1/4th thk of concrete slab with mechanized screw and filling the same with semi rigid epoxy based Rockite or equivalent sealant including preparation of base, curing finishing etc complete as directed. Reinforcement including dowel bars will be paid under the relevant item of reinforcement.

6.14 Extra for providing, mixing and laying of IRONITE.

The ironite shall be consisting of uniformly graded iron particles, free form non-ferrous metal particles, oil, grease, sand and soluble alkaline compounds. This shall be mixed with cement in proportion of 4 cement and 1 compound by eight. The laying procedure is same as per the specification for IPS flooring.

Mode of Measurement

The metallic compound added to the IPS flooring shall be measured in Kg.

6.15 Providing & laying PVC tiles flooring

This shall be laid over IPS flooring. These shall be of approved make. The tiles shall be fixed as per the Manufacturer's specifications.

Mode of Measurement

This shall be measured in sq.m.

6.16 Providing & Laying acid and alkali proof, non-skid ceramic tile Flooring

Ceramic tiles of 20mm thick in sizes and quality as specified in the item description shall be laid for floor on 37mm thick concrete bed of 1:2:4 (1 cement, 2 sand, 4 coarse aggregate of nominal size 12mm and down). The floor shall be first applied with a coat of acid alkali primer and then the bed concrete is laid. The acid alkali proof powder shall be added to the bed concrete in proportions specified by the manufacturer. The tiles shall be laid in proper line, level and slope and with joints of thickness 6-10mm even all around. It shall be cured for 7 days. Then the joints shall be filled with acid alkali proof powder and epoxy resin as specified in the item description. All joints shall be finished neat and it shall be kept dry for atleast for 48 hours.

Mode of Measurement

It shall be measured in sqm. The unit rate shall include the providing and fixing of tiles as specified above. The rate is for work at all levels.
6.17 Providing & Laying Mandana in flooring, skirting and dado.

The sizes of the stones shall be 600 mm x 600 mm or 600 mm x 450 mm or 450 mm x 450 mm x 300 mm or 300 mm x 300 mm as directed, and the thickness shall be 37 mm for flooring and 15-20 mm for skirting and dado. The stone shall be acid and alkali resistance and approved by the Engineer.

The approved quality of acid and alkali preventive primer shall be applied uniformly in two coats over the slab or the concrete surface. The acid-alkali proof powder shall be mixed with the cement in the proportion 2:1 (2 cement:1 powder) or as per the manufacturer's specification. The cement powder mix and sand shall be mixed in the ratio 1:3 and the mortar shall be prepared. The stones shall be laid on the mortar bed in level and line with even thickness of 6mm to 10mm joints all around.

The joints shall be raked to 12-19 mm deep and filled with epoxy based resin. The resin is mixed with quick drier and acid-alkali proof powder. As the resin is an atmospheric hardening agent, it does not require curing. The work shall be kept dry for the joint filling operation. The stones shall be either hand polished or machine polished cleaned with oxalic acid and then wax polished.

Mode of Measurement

The work shall be measured in sq.m part thereof. The rate shall be inclusive of providing and laying of stones as described above. Nothing extra shall be paid for cutting holes in the stones, machine cutting of edges, stones for steps and risers etc.

6.18 P & L Ceramic tiles in flooring, skirting and dado

The ceramic tiles in flooring and dado shall be of first class quality as specified in the item specification & shall be of standard size without warp and with straight edges true and even in shape and size and uniform colour. The tiles surface shall be of fine grained texture, dense & homogeneous. The thickness of the tile shall be as per the item specification. The tiles shall be submerged in water till the bubbles cease.

The tiles should be laid on a base of 12 mm thick mortar bed (cement or lime 1:3 sand) & cement (3 Kg/sqm) paste. The tiles shall be laid truly vertical on walls and truly horizontal on floors or to slopes as directed. The joint shall be very thin, uniform and perfectly straight. The tiles in dado shall be finished in such a way that, only that tile thickness projects over the finished plaster or as specified otherwise. Where full tiles are not possible, the same should be cut or sawn to the required size and their edge rubbed to ensure straight and true joints. After tiles are laid extra cement grout shall be removed. The joints shall be cleaned with wire brush and then the joint shall be floated with white or grey cement as approved by the Engineer. The tiles shall be cleaned after the work is complete.

Mode of Measurement

This shall be measured in sqm. The rate quoted for flooring and dado work shall be inclusive of angles and corner pieces, cutting tiles for water points, such away that the point is in the junction of four tiles, electrical points etc.
6.19 Providing & Laying Glazed tiles.

-DO- same as item 6.18.

6.21 Providing Special Mirror Finish Polish on Kota Stone

This shall be carried out by using 500 to 2000 grit emery polishing in six stages and final finishing with 2000 grit tin oxide and felt pads. The work shall be carried out with polishing machine with vibration free rubber lined mounting wheels.

Mode of Measurement

It shall be measured in sqm.

6.22 Providing & laying Granite flooring

The stone shall be of specified quality, hard sound homogeneous in texture, free from cracks, weathering & flaws. All stones shall match each other. All edges shall be true moulded & free from chippings, the surface shall be level, smooth and machine rubbed. The stones shall be laid on a cement mortar bedding of 37 mm thick 1:2 (1 cement  sand). No. cement slurry shall be applied after each grinding. The flooring, skirting, dado, tread and platforms shall be pre polished.

Mode of Measurement

It shall be measured in sqm and no deduction upto 0.05 sqm opening. The rate shall include providing, laying, curing and mirror polishing.

6.23 Providing and Laying Shadbad stone in flooring

The specification is same as for item no. 6.05.

Mode of Measurement

Same as per item 6.05

6.24 Providing & Laying Shabad stone in skirting and dado

The specification shall be same as item no. 6.06.

Mode of Measurement

Same as item 6.06.
6.25 Providing & Applying 115mm thick water proofing treatment

First a layer of about 20mm thick in CM 1:3 (1 cement, 2 coarse sand) mixed with waterproofing compound of M/s India Waterproofing Co., Bombay or equivalent shall be laid as instructed by the Engineer. Then brickbats shall be laid over this at the required slopes and levels as per the drawings and the instructions of the Engineer. The surface of the brickbats shall be finished smooth with another layer of water proof plaster and the gaps between the brickbats shall also be filled with CM mixed with water proof plaster. Finally the surface is finished smooth and desired patterns are formed on the surface with thread. All openings, sleeves, drains, pipes etc. shall be specially treated and made sure that they are water tight.

Mode of Measurement

The item shall be measured in sqm. The wall flashing or the watta shall also be measured in sqm. A guarantee certificate for a period of ten years shall be issued by the Contractor for free maintenance of the treated area.

6.26 Providing & Laying 75mm thick water proofing

-DO- same as item 6.25 but for 75mm thick.

6.27 Providing & Laying Cast Iron Tiles Flooring

Cast iron tiles of specified size shall be supplied to the Contractor and he has to take the delivery from the NDDB stores without any extra cost. The tiles shall be stored safely as any loss or damage shall be at the Contractor’s cost. The tiles shall be laid over a bed of 37mm thick 1:2:4, (1 cement : 2 coarse sand : 4 graded stone aggregate of nominal size 12mm and down). The tiles shall be fixed in line and level as per the drawing and as directed by the Engineer. The joints shall be filled with 1:1 cement mortar (1 cement : 1 sand). Curing shall be done at least for 15 days. The tiles shall be hand/machine polished and the entire surface shall be smooth and all joints shall be filled properly.

6.28 Providing & Laying pre-polished Cuddappah stone in treads

The specification is same as for item 6.07.

Mode of Measurement

Same as for item 6.07.

6.29 Providing & Laying Cuddapah stone in shelves

Same as per item 6.09.

Mode of Measurement

Same as per item 6.09.
SECTION-7.00 STEEL WORK

Applicable Codes.

IS : 4351 - Steel door frames
IS : 1038 - Steel door, Windows and Ventilators

7.01 Providing & Fixing pressed steel frames for doors.

They shall be made of hollow metal pressed section of approved make such as "Perfect Industrial Products", TIL of equivalent make. They shall be single/double rebates as per the Architect's drawing. It shall be made of CR sheet and size 65x125x1 mm thick. It shall be provided with four hinges of 125x2 mm thick of friction type. Four hinges shall be provided per leaf of the door. The frame shall be provided with 4 holdfasts of size 150x20x3 mm for each side and the same shall be embedded in brick work with CC 1:2:4 blocks of size 300x230x230 mm. The hollow portion of the frame shall be filled with CC 1:2:4 before it is fixed.

The frame shall be painted with red oxide primer. There shall be provision in the frame for fixing of tower bolts, aldrop, louvers, mortice lock etc. The frame shall be painted with two or more coats of approved synthetic enamel paint to get a uniform finish.

Mode of Measurement

It shall be measured in SQM. The rate shall include providing and fixing of pressed frame as per above specifications.

7.02 Providing & Fixing pressed steel section windows for fully openable windows

The frame shall be of size 100x6x1 mm thick and it shall be of perfect Industrial Products", TIL, Senharvic, Agew or of any approved make. The frames shall be double rebated. The frame shall be provided with 3 holdfasts of 100x15x3 mm long and the same shall be grouted with CC 1:2:4 in the brick work or to RCC member. Shutters shall be made of standard steel sections style F7d, sash bar of T6 and locking bar of F4b section. The hollow portion of the frame shall be filled with CC 1:2:4 before fixing the frame.

Glass of 4mm or 5.5mm shall be fixed with beading as per the Architectural drawing. The beading shall be of Aluminium of GI hollow square pipe of 10 sqmm & wall thickness 1.25 mm.

The Section shall be provided with arrangement for fixing the MS or aluminium oxidized and washers. The window section shall be painted with one coat of primer and two coats of synthetic enamel paint of approved make and shade.

Mode of Measurement

It shall be measured in sqm. The rate shall be for providing and fixing steel windows as per the above specifications.
7.04 -DO- same as item 7.02 for partly openable and partly fixed windows
   -DO- same as item 7.02.

7.05 -DO- same as per item No.7.01 but for louvred ventilators
   -DO- same as above but provision shall be given for fixing 4/5.5 mm thick glass.

7.08 Providing and fixing Rolling shutters.

   The rolling Shutter shall be of 18 gauge MS solid laths or grill with all the accessories such as top cover (Conform to the size indicated in drawings and shall be of quality specified in the item specification. The rolling slats shall be in one piece and be made of have gauge steel sheet minimum 19 swg in thickness. A cylindrical hood shall be provided on the top to enclose the shutter when it is open. The rolling shutters shall be provided with suitable locking arrangements and deep channel guides. In case galvanized rolling shutters are specified the rolling shutter shall be made of hot dip galvanized slats hood, deep channel guides all preferable in one piece. The channels guides shall be fixed with holding down bots with PCC 1:2:4 (1 cement, 2 sand, 4 coarse aggregate of nominal size 12mm and down) holing

   In case of hand operated pull and push type rolling shutters and very large gear operated rolling shutters of sizes larger than 10 sqm. in area, they shall be provided with ball bearings for smooth and efficient operation. In case of large rolling shutters and depending upon local wind conditions, the rolling shutters should be provided with special locking type of wider channel guides or it shall be provided with central movable channel supports to take up the design wind pressures in the area.

Mode of measurement

   i) The measurement shall be in sqm. The width shall be measured as the width of the shutter including the portion hidden in the guide channels and the height shall be measured from the bottom of the locking plate to the bottom of lintel and to this 450 mm shall be added for the top hood.

   ii) The rate quoted shall be inclusive of providing & fixing or rolling shutter with push & pull arrangement, two coats of approved paint over 2 coats of approved primer coat (one shop coat and one coat after erection). Fixing lugs to be provided to guide channel to suit actual site conditions or as directed by the engineer at no extra cost. The mechanical arrangement provided for the opening and the closing of the shutter shall be paid for separately in sqm of the shutter area as specified in the item description.

7.09 Providing & Fixing Mechanically operated rolling shutters

   The specifications same as item no. 7.08

7.10 Providing & Fixing partly grilled Rolling shutters

   The specifications same as item no. 7.08
7.11 Providing & fixing in position grill, railing, steel ladder etc.

This work shall be carried out as per the detailed drawing or the Architect. The MS sections shall be of approved quality. The welding shall be perfect and the junctions shall be ground properly. The frames shall be provided with holdfasts and the same shall be grouted with CC blocks of 1:2:4 in brickwork. It shall be painted with one coat of primer and 2 coats of approved synthetic enamel paint.

Mode of Measurement

The dimensions of the members shall be measured in unit lengths and the same shall be converted into weights as per the standard steel table. The payment shall be done based on the weight of the item.

7.12 Providing & Fixing MS inserts in RCC and Brick work

Inserts, bolts etc shall be provided in masonry and concrete works as indicated on the drawing. It is imperative that all inserts, bolts fixtures and fittings shall be provided in their position very accurately. Such inserts and bolts be fixed with necessary templates. If due to negligence on the part of the contractor, the inserts, bolts fixtures, and fittings etc, are out of alignment the contractor shall make arrangements to have the inserts and bolts removed and refixed in their proper position as directed by the engineer, at no extra cost. The exposed parts shall be painted with one coat of primer and two coats of approved synthetic enamel paint.

Mode of Measurement

It shall be measured in KG. The measurements at site shall be taken in unit lengths and the same shall be converted into weight using standard steel coefficients, actual weight taken in the presence of the Engineer.

7.13 Providing & Fixing MS gate

It shall be as per the drawing. The welding shall be perfect and the junctions shall be ground properly. The gate shall be provided with locking arrangements, hinges and it shall be painted with one coat of primer and two coats of approved.

Mode of Measurement

All the members of the gate shall be measured in unit lengths and the same shall be converted into weight using standard steel tables. The payment shall be made in kg.

7.14 Providing & Fixing GI pipe railing

It shall be done with the specified class of GI pipe as per the item in the Schedule of Quantities. The design shall be as per the drawings/instructions. All necessary specials, bends, elbows, tees and holdfasts or clamps shall be provided. If the pipe railing is to be fixed on ground or brick work, it shall be done by embedding the holdfasts, as directed by the Engineer, in concrete blocks PCC 1:2:4 (1 cement, 2 sand, 4 traded coarse aggregate of size 12mm & down). If it is to be fixed to a RCC member, the pipe shall be welded to the steel plate by embedding it in the RCC members.
Mode of Measurement

The running length of the railing shall be measured. The vertical shall not be paid separately.

7.15 Providing & Fixing MS door frame

It shall be fabricated from structural steel as per the details and drawings. All the members shall be free from rust, flakes, cracks and other fabrication defects. All holes for hinges, bolts, locking plated etc. shall be provided as per drawings/ instructed. The welding shall be smooth. The frame shall be erected and fixed with MS holdfasts of specified size and grouted with cement concrete 1:2:4 (1 cement, 2 sand, 4 graded coarse aggregate of nominal size 12mm and down) The frame shall be painted with a coat of primer before erection and 3 coats of synthetic enamel paint of specified quality after erection.

Mode of Measurement

The length of the members shall be measured and be converted correspondingly to weight in kg using the standard unit weight coefficients. The rate shall include fabrication, erection and painting of the frame.

7.16 Providing & Fixing MS sheet door

The frame shall be of MS as specified above. The door shall be as per the Architect's design. The specified gauge MS sheet door shall be welded to the frame. It should have 3 to 6 hinges depending on the shutter size. It shall have fittings as specified in the item/ Architect's drawings. The door shall be applied with a coat of primer and 2 coats of synthetic enamel paint of quality as specified.

Mode of Measurement

This shall me measured in sqm. If the frames are not included in the item then only the shutter area shall be measured & paid for. The rate shall include fabrication, provision, erection of the door, necessary fittings as specified, painting etc. all complete.

7.17 Providing & Fixing GI barbed wire fencing

This fencing shall either be made with RCC posts and struts or with MS posts and struts. RCC posts and struts shall be of size & length as specified in the item description in the Schedule of Quantities. It shall be free from cracks, twists and honey combing.

MS posts & struts shall be of size & section as specified in the item description. One end of the angle shall be forked to have grip in the concrete and the other side shall have a hole to receive the fencing wire. It shall be applied with a coat of primer & 2 coats of synthetic enamel paint.
It shall be 12 to 14 gauge with 4 points barb two wires twisted together or as specified in the item description. It shall be circular in section, free from scale and other defects and uniformly galvanized. The type, length and standard weight of the GI barbed wire shall be as specified below:

<table>
<thead>
<tr>
<th>Nominal dia of wire</th>
<th>Point wire between two</th>
<th>Nominal distance</th>
<th>Length in M/100kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5mm</td>
<td>2.24mm</td>
<td>75mm</td>
<td>Min. Max</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1000</td>
<td>934 1066</td>
</tr>
<tr>
<td>2.5</td>
<td>2.4</td>
<td>150</td>
<td>1134 1066</td>
</tr>
<tr>
<td>2.24</td>
<td>2.24</td>
<td>75</td>
<td>1576 1490</td>
</tr>
<tr>
<td>2.24</td>
<td>2.24</td>
<td>150</td>
<td>1890 1778</td>
</tr>
</tbody>
</table>

The GI barbed wire shall be well stretched in number of rows as specified with two diagonals. The spacing shall be at least 15cm from the ground and the rest shall be embedded in PCC 1:2:4 or as specified. It shall be fixed in line, level and plumb. The grouting concrete shall be cured for 7 days. The barbed wire shall be held to posts by means of GI staples, U slips or GI binding wire as specified. Turn buckles and straining bolts shall be used at the ends. Two struts shall be provided at the corners and at every 28M. The length of the strut shall be 1.5 times the length of the post.

Mode of Measurement

It shall be measured in RM. The unit rate shall include providing and fixing of posts, struts, barbed wire, painting of MS posts and struts and curing etc. all complete.

7.28 Providing & Fabrication z-type ventilators

Notes:
1. Steel windows and ventilator shall be fabricated out of steel sections confirming to IS:226, and IS:2202.
2. For fabrication of standard steel section Door, windows & ventilators following sections shall be used:
3. Net area of opening shall be measured and paid for relevant item.
SECTION 8.00 ROOFING WORK

8.01 Providing, Fabricating & Erecting MS Structural steel work for trusses, purlins, girders, columns, rafters, struts, wind ties, bracings etc.

All structural steel materials such as angles, RS joists, flats, tees, plates, channels etc. shall conform to the latest edition of IS 226. All structural steel shall be free from twist before fabrication. Cutting of members shall be done by shearing, cropping, sawing or gas cutting. Contact surfaces of plates and butt joints shall be accurately machined over the whole area so that the parts connected shall butt over the entire surface of contact. Welding of pieces shall be done with the approval of the Engineer.

The components parts shall be assembled in such a manner that they are not damaged in any way and specific cambers as shown in the drawing or as directed by the Engineer, shall be provided.

For bolted connection, where necessary washers shall be tapered or otherwise suitably shaped to give satisfactory bearing. The threaded portion of the bolt shall project beyond the nut by at least 1.5 thread.

Welding shall be done in accordance with the latest edition of IS 813 and 814, Code of Practice for use of Electric Arc welding for general Construction in mild steel. In welding it must be ensured that the base metal is in fused state when filler metal makes contact with it; filler metal does not overflow upon any unfused base metal; base metal is not cut along the weld edges; flowing metal floats the slag, oxide and gas bubbles at the surface behind advance pole. For this current shall be adjusted or the electrode size is changed. Welding shall be free from cracks, discontinuity, under or over size welding thickness.

Surface to be welded shall be free from loose mill scale, rut, grease, paint and any other foreign material. As far as possible avoid the welding at heights and at difficult positions. Generally fillet welding is preferred. The parts to be welded are brought in as close contact as practicable and rigidly clamped together.

Before erection, steel work shall be thoroughly cleaned of rust, loose scale, dust, welding slag, and shall be given one coat of red oxide primer of approved make and one coat of synthetic enamel paint of approved make as specified in the item before erection and final coat of painting after the erection as directed.

Steel members shall be hoisted and put in position carefully without any damage to the member and to the building and labour. The trusses shall be lifted at such points that they do not buckle or deform or be unduly stressed. The end of the truss which faces the prevailing wind shall be fixed and the other end may be kept free to move. The steel work shall be securely fastened wherever necessary, temporarily braced, to provide for all loads to be carried by the member during erection including the load due to the erection equipment and its operation. No permanent bolting or welding is done until proper alignment has been obtained. The holes for the rivets shall be determined with the help of templates and drilled. Erection clearance of the cleared ends shall not be more than 1.5mm and without cleaning end clearance shall not be more than 3mm. Grouting or embedding of structural steel members done after the approval of the alignment, level & position of the members by the Engineer.
Important points

Before the actual execution of the job, the Contractor shall prepare fabrication drawings for all structural steel work from the structural drawings supplied to him and determine the exact cutting lengths of the members, sizes of gusset plates, welding lengths by marking out on a level platform to full scale.

Welding plant, electrodes and other equipments, scaffolding, labour shall be arranged by the Contractor at his cost. Erection equipment of required capacity, sufficient number of spare parts & staff shall be maintained by the Contractor at site at his cost.

Mode of Measurement

All structural steel members shall be measured in lengths and are converted into weights as per IS tables. All rivets, bolts shall be measured in kg. and paid for. No deduction shall be made for rivet holes and bolts. Nothing extra shall be paid for wastages.

8.03 Providing & Fixing MS Chequered plates

The chaquered plates shall be cut to the required shape with arc gas cutting machine. The cut edges shall be ground and finished properly. The plates shall be given a coat of primer and two coats of approved synthetic enamel paint.

The cross section of the plates shall be measured and it shall be converted into weight using standard steel table and paid for.

8.04 Providing & Fixing MS holding down bolts

The MS holding down bolts of specified dia. length and shape shall be provided as per the drawings in line & level. These shall be fixed to RCC work or brick work by grouting it with concrete. The bolt shall be provided with nuts and washers. The grease shall be applied to the threaded portion with the help of templates. If the bolts need some adjustment it shall be provided with a wooden piece 75x75mm or 50mm dia GI pipe around bolt shall be provided at the time of concreting and shall be removed after initial set.

Mode of Measurement

The length of the bolt is measured and according to the dia of the bolt the length shall be converted into weight using standard steel tables.

8.05 Providing & Fixing AC corrugated sheets

AC sheet and accessories shall be free from cracks, chipped edges and corners. The fixing shall be done as per the latest edition of IS 459. The spacing of the purlins shall not be more than 1.4m for 6mm sheets. The light shall not be visible form the joints of the AC sheets. The AC sheets to be kept on ceiling shall be placed with smooth side upward and the AC sheets to be put in cladding shall be placed with smooth side out side. The AC sheets shall have at sides a lap of half corrugation and an end lap of 150mm minimum. The free over hangs at ends shall not be more than 300mm. Hole for 8mm dia L or J bolts shall be drilled and not to be punched in the ridge of the
corrugation. The diameter of the hole shall not be more than the diameter of the bolt by 1.5mm. The bolts shall be galvanized J or L hooks with nuts and two nos. of bitumen washers. All AC sheet accessories shall be painted or white washed as specified in the item or directed by the Engineer.

Mode of Measurement

The AC sheet roofing shall be measured in sq.m. It shall include all tools, plants, ladder, scaffolding, triangular pieces in cladding or at gable ends or at north light, side laps and end laps. The work shall be carried out at all heights without any extra cost.

8.06 Providing & Fixing AC & G.I.accessories

-DO- same as above but for Northlight curve, AC ridges, Curves, Corner pieces, Barge boards, Eaves board, G.I.gutters etc.

Mode of Measurement

These accessories shall be measured in RM.

8.07 P & F Aluminium Flashing

This shall be fixed between the RCC facial and the AC sheets with bitumen to prevent leakage. The work shall be carried out as per the item specification.

Mode of Measurement

It shall be measured in sqm. sunless specified otherwise.

SECTION 9.00 MISCELLANEOUS WORKS

9.01 Providing & fixing approved make 6 lever Mortice lock with pair of brass oxidized/chromium plated handles.

This shall be measured in nos. The rate quoted shall be for providing mortice lock with handles in doors and finishing as per item schedule.

9.02 Providing and fixing hydraulic door closer of approved size and make such as EVERITE/HYPER/GARNISH or equivalent as directed.

This shall be measured in no. This shall be fixed at places as directed by the Engineer.

9.03 Filling the electrical zaris 250mm to 150mm wide and 25mm to 100mm deep with cement mortar 1:3 and finishing the same to match with the surrounding white wash or any other finish, etc. complete as directed.

This shall be measured in RM. No patch shall be seen after the zaris are filled up.

9.04 Dismantling brick masonry walls and partitions, plastered or unplastered as per instructions including finishing the broken surface to match with the surrounding, removing the debris as directed within site, cutting the reinforcements if any etc. complete as directed.

The work shall be measured in cum.

9.05 Dismantling the RCC beams, slabs, lintels, columns, pardi walls, platform etc. including
finishing the broken surface to match with the surrounding, removing the debris within site, including cutting the reinforcement if any etc. complete as directed.

This shall be measured in cum.

9.06 Filling the zaris 25mm to 150mm wide and 50 to 100mm deep with CM (1:3:4) and Finishing with plaster to match with surroundings including chiseling, curing etc. complete as directed.

This shall be measured in RM.

9.07 Making holes upto 30 cms. in dia. or 30 x 30 cms. in size in RCC works and filling the same with PCC (1:2:4) and finishing the same as per surrounding including scaffolding, cutting the reinforcement bars, curing etc. complete as directed.

This shall be measured in nos.

9.08 -Do- same as item no. 9.07 but in brick masonry wall.

This shall be measured in nos.

9.09 Providing and fixing in RCC side wall or bottom or cover slab of sump the following size GI B class pipes maximum 300 mm long with outside flanges/threaded end or connecting the inlet, outlet, washout and overflow pipes of 150 mm dia.

The specification of the GI pipe shall be as per the specification given in Section 11.00 of the this Technical specifications. It shall be placed during concreting the walls of the sump of underground/over-head water tanks etc.

It shall be measured in nos. The rate quoted shall be for providing and placing of the pipe with flange or threaded in line and level.

9.10 Providing and fixing in RCC side wall or bottom or cover slab of sump the following size GI B class pipes maximum 300 mm long with outside flanges/threaded end or connecting the inlet, outlet, washout and overflow pipes of 100 mm dia.

The specifications same as item no. 9.09.

9.11 Providing and fixing in RCC side wall or bottom or cover slab of sump the following size GI B class pipes maximum 300 mm long with outside flanges/threaded end or connecting the inlet, outlet, washout and overflow pipes of 75 mm dia.

The specifications same as item no. 9.09.

9.12,13&14 Providing & fixing in RCC side wall or bottom or cover slab of sump the following size GI B class pipes maximum 300mm long with outside flanges/threaded end or connecting the inlet, outlet, washout & overflow pipes of 50mm, 38mm & 25 mm dia.

The specifications same as item no. 9.09.

9.15 Providing & fixing removable CI gratings of approved quality for rain water pipes including painting the same with two coats of approved enamel paint as directed for 100 mm dia.
The shall be measured in no.

9.16 Providing & fixing removable CI gratings of approved quality for rain water pipes including painting the same with two coats of approved enamel paint as directed for 150 mm dia.

- Do - same as item No. 9.15

9.22 Providing and fixing vent cowl

The vent cowl shall be of CI or PVC as specified in the item description. It shall be of approved quality.

Mode of Measurement

It shall be measured in nos

SECTION 10.00 ROAD WORK

Materials

Moorum

It shall be got from approved quarries. It shall be grannular and gritty. It shall be free from dust, all rubbish, and any organic materials as well as clods of black cotton soils. The material shall be got approved prior to its use in road construction.

The material shall be stacked on a level ground. If the item is only for supplying of murrum, then it shall be measured in cum. The rate shall include digging the murrum, supplying at site, conveying with all lead and lift and stacking the same at site as directed by the Engineer. The rate shall also include all tolls, duties, fees, royalties etc.

Sand

The sand shall be from a river or nala or sea. It shall be clear, sound, properly graded; free from organic material, silt, clay etc. and it shall be well graded.

Metal

The stone metal shall be hard, sound, durable, stone of close texture as is locally available and reasonably free from decay and weathering. It shall be angular or cubical, and round elongated or flaky metals shall be rejected. No round or oblong pebbles or angular chips shall be allowed. The size of the metal shall be 40mm to 63mm. All disintegrated stone shall be rejected. The metals shall be tested for Abrasion value, Aggregate Impact value and Flakiness Index in standard laboratories before the material is put to use and they shall conform to relevant IS codes as given in page 4.16 of this section. Metal shall be stacked at site on fairly level ground.

Rolling

A power roller shall, as a rule, be not less than 10 tones but if at any time still heavier rollers are required on the works the contractor shall have to bring them as may be directed by the Engineer. A hand roller should not be less than a ton. Rolling shall progress from edges to the center of the road in strips parallel to the centre line of the road. Rolling shall be done by lapping uniformly each preceding rear wheel track by at least one half width of the track.

On super elevations, rolling shall be started at inner edge & shall progress towards outer
edge. During and after rolling, the surface shall be checked for grade and camber, with camber plate. The roller shall be started, worked or stopped without jerks. Rolling shall not normally be done length less than 100 M.

10.01 Surface dressing including preparation of sub grade

The high portion of ground shall be cut down and/or hollows & depression shall be filled up to 300 mm. The gradient & camber/slope should be maintained as per requirement so as to give an even, neat and tidy look to the work. The measurement will be in sq.m. The area requiring cutting or filling more than 300 mm shall be paid separately under relevant items of earth work and surface dressing item will not be applicable. Earth from cutting will be used for filling. The rate for the item shall also include jungle clearing viz plants, shrubs, grass etc. excluding trees.

Preparation of Subgrade

The sub grade shall be leveled approximately to the proper level & camber by filling depressions with excavated material & cutting of protuberances. The sub grade shall be made to have as nearly as practicable, a uniform bearing layer and all hard spots therefore be properly excavated and refilled. All soft and spongy parts of the sub grade shall be excavated & refilled with approved materials of 15 cm layers for the same reason. The cost of this excavation will be paid under the item for excavation. The sub grade shall be watered as directed at least 12 hours before a 10 MT roller is put on it.

Proper accesses should be prepared for the roller to get to the sub grade and all manholes frames and covers should be removed and replaced by plates of adequate strength free of cost whenever they interfere with the free rolling of the subgrade.

After rolling the camber, super elevation and longitudinal slope etc. of the subgrade shall conform in shape to those of the finished road surface. This should be checked with the help of level strings and camber board, if necessary. When subgrade consists of black cotton soil, a thin layer of murrum or coarse sand shall be provided below any base course, watered and rammed and rolled tightly.

Mode of Measurement

The work shall be measured in sq.m. The rate quoted shall include jungle clearing, leveling the surface, dressing to the required shape, grade and camber and rolling.

10.02 Providing & Laying Base course

65 mm, nominal size or as specified, metal shall be spread over the prepared base to a thickness of 130 mm in one or two layers as specified, the metal layer dry and wet shall then be rolled and consolidated by a 10 tone power roller. The thickness of the consolidated layer after completing all the operations described below shall be less than 100mm then blinding material like murrum or red Bajri shall be laid and watered and rolled. Rolling shall start from edge of road and proceed towards the crown in longitudinal strips overlapping on successive strips by at least one half the width of the rear wheel of the roller. The operation shall continue till no visible settlement of the metal or movement under the roller is observed. The gradient and camber shall be checked from time to time by means of level, stacks, strings camber board etc. Any depression or hump shall be corrected by removing completely the metal layer there at the spot and rolling the same satisfactorily.
After the dry rolling is completed, grit, stones, dust, sand etc. shall be spread. Moderate sprinkling of water & rolling shall be continued & stone dust shall again be spread if required till all the voids are completely filled & the movement of metal under the wheel ceases. If there is excess powder the same shall be removed lightly by brooms.

The surface shall be checked for camber etc. the unevenness or undulations shall be rectified as required. The whole surface shall be then watered, extra powder added if required, brushed and rolled to obtain a mosaic surface. This type of surfaces shall be maintained till upper layer is laid.

Mode of Measurement

The metal spreading and compaction shall be measured, under single item, in sq.m., the thickness of the layer shall be as specified in the item specification or in cum as specified in the Schedule of Quantities. The rate shall include all the works described above.

10.03 Providing & Laying wearing course

50 mm metal shall be spread, in one or two layers, over the prepared base to a thickness of 100 mm consolidated and the rate of spreading grit shall not be less than 10 to 15 cft/100 sq.ft. the other operations such as rolling watering etc. as item 10.02.

Mode of Measurement

-Do- same as item 10.02.

10.04 Providing & Laying 37.5mm thick layer of hot asphalt & aggregate over the wearing course

The surface shall then be brushed free of any loose blinding material out of the voids into which it has set. The surface then shall be tested for depression, which shall be made up by remetalling and blinding with aggregate of a size equivalent to the depth of the depression.

Bitumen 80/100 of approved brand, heated to a temperature of 350 Deg.F. shall then be applied evenly to the road surfaced by means of a pressure distributor at the rate of 25 kg per 10 sqm.

While the bitumen 80/100 is still hot the surface shall be laid evenly with premix aggregate of 20mm size well mixed with bitumen. The stone aggregate shall be hot & dry and contain not more than 2% moisture before use. It shall be first screened of dust, measured and heated. The rate of application of stone chips shall be 0.20 Cum Per 10sqm or as specified in the Schedule of Quantities.

After spreading of the premix carpet the road shall be given a final rolling with 10 tone power roller. Any soft spot or depressions detected at a later date shall be made up as directed by the engineer.
Mode of Measurement
This shall be measured in sqm.

10.05 Providing & Laying Seal coat with hot bitumen

Seal coat is applied to waterproof road, to seal the surface, to prevent oxidation due to air circulation to strengthen bitumen surface or to improve texture, reduce porosity and tendency to disintegration.
Seal coat with hot bitumen: Treatment consist of applying a coat of hot bitumen 2.5 kg/sq.m. On prepared surface, blinding with stone grit 0.30 cu.m./10m. And consolidating with road roller of 10 tone.

Mode of Measurement

It shall be measured in sqm. If the quantity of grit & kg of asphalt per sqm of surface is given in the item specification the same shall be adhered to. The rate shall include covering the surface with sand and removing the sand after 2-3 days as directed by the Engineer.

10.08 Providing & Laying RCC kerb

Road kerbing shall be cast-in-situ/precast cement concrete stone as per the item description in the Schedule of Quantities. In case of pre-cast kerb it shall be laid over Brick bat concrete 1:4:8 150 mm thick or as specified in the ground and the joint between the two stone shall be filled up with cement mortar (1:6). The stones shall be cast with cement concrete of 1:2:4 proportion within the project premises. The stone shall be red for at least 15 days. Contractor shall have to make one tank at his own cost for curing the stones.

Mode of measurement

The whole work shall include excavation, cutting roads if necessary, laying of bed concrete, shuttering, excluding reinforcement, casting, exposed concrete finishing and curing the kerb stones. The item shall be measured in RM.

10.10 Providing and Laying RCC roads

Mixing and placing of concrete, compacting & curing shall be as per RCC specification. Before concreting the form work should be placed to exact alignment, line & level. The width of panel shall not be more than 6 M. Alternative panels should be cast to avoid cracking and cured. The top surface of the road slab shall be either floated finish or striped finish or brush finish or broom finish using neat cement slurry as directed. The entire work shall be cured for minimum 15 days.

Mode of Measurement

The work shall be measured in cum. The rate shall include cost of form work, casting & curing of the slabs. It shall also include the finishing the slab as per the item description. Reinforcement work shall be measured in respective item of work separately.

10.11 Providing & Laying P.C.C. 1:4:8

General specifications are same as item no. 2.02.
10.12 Providing & Fixing TMT bar Reinforcement steel.

General specifications are same as item no. 2.11.

SECTION 11.00 WATER SUPPLY

11.01 a) Providing & Laying under ground GI pipe line for 100mm dia

The pipes shall be galvanized mild steel welded pipes & screwed and socketed tubes conforming to the requirements of IS:1239, for medium grade. They shall be of the diameter (nominal bore) specified in the description of the item. The sockets shall be designated by the respective nominal bores of the pipes for which they are intended. The pipes & sockets shall be cleanly finished well galvanized in & out & free from cracks surface flaws, laminations, and other defects. All screws threads shall be clean and well cut. The ends shall be cut cleanly and square with the axis of the tube.

All screwed tubes & sockets shall have pipe threads conforming to the requirements of IS:554 screwed tubes shall have taper threads while the sockets shall have parallel threads.

The fittings shall be of malleable cast iron or mild steel tubes complying with all the appropriate requirements as specified for pipes. The fittings shall be designated by the respective nominal bores of the pipes for which they are intended. The fittings shall have screw threads at the ends conforming to the requirements of IS:554 Female threads on fittings shall be parallel & male threads (except on running nipples & collars of unions) shall be taper.

The pipes & fittings shall be inspected at site before use to ascertain that they conform to the specification. The defective pipes shall be rejected. Where the pipes have to be cut or rethreaded, the ends shall be carefully filed out so that no obstruction to bore is offered. The end of the pipes shall then be threaded conforming to the requirements of IS:554 with pipe dies & taps carefully in such a manner as will not result in slackness of joints when the two pipes are screwed together. The taps and dies shall be used only for straightening screw threads which have become bent or damaged & shall not be used for turning of the threads so as to make them slack, as the latter procedure may not result in a water tight joint. The screw threads of pipes & fitting shall be protected from damage until they are fitted.

The pipes shall be cleaned of all foreign matter before being laid in jointing the pipes, the inside of the socket & the screwed end of the pipes shall be oiled and rubbed over with white lead and a few turns of spun yarn wrapped round the screwed end of the pipes. The end shall then be screwed in the socket, tee etc. with the pipe wrench. Care should be taken that all pipes and fittings are properly jointed so as to make the joints completely water tight and pipes are kept at all times free from dust and dirt during fixing. Purr from the joint shall be removed after screwing. After laying, the open ends of the pipes shall be temporarily plugged to prevent access of water, soil or any other foreign matter. Any threads exposed after jointing shall be painted or in the case of under ground piping thickly coated with approved anticorrosive paint to prevent corrosion.
If the galvanized iron pipes and fittings are laid in trenches, the widths and depths of the trenches for different diameters of the pipes shall be as in the table given below:-

<table>
<thead>
<tr>
<th>Dia of pipe</th>
<th>Width of trench</th>
<th>Depth of trench</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 mm to 50mm</td>
<td>30 cm</td>
<td>60 cm</td>
</tr>
<tr>
<td>65 mm to 100mm</td>
<td>45 cm</td>
<td>75 cm</td>
</tr>
</tbody>
</table>

At joints the trench width shall be widened where necessary. The work of excavation & refilling shall be done true to line & gradient in accordance with general specifications for each work in trenches. The pipes shall be painted with two coats of anticorrosive bitumanistic paint of approved quality. The pipes shall be laid on a layer of 7.5 cm sand & filled up to 15 cm above the pipes. The remaining portion of the trench shall then be filled with excavated earth. The surplus earth shall be disposed off as directed when excavation is done in rock the bottom shall be cut deep enough to permit the pipes to be laid on a cushion of sand 7.5 cm minimum. In case of bigger diameter pipes where the pressure is very high thrust blocks of cement concrete 1:2:4 (2 cement: 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) shall be constructed on all bends to transmit the hydraulic thrust without impairing the ground sand spreading it over a sufficient area.

TEST

After laying and jointing, the pipes and fittings shall be inspected under working conditions of pressure and flow. Any joint found leaking shall be redone and all leaking pipes removed and replaced without extra cost.

The pipes and fittings after they are laid shall be tested to hydraulic pressure of 6 kg/sq.cm. (60 MWC). The pipes shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock or water hammer. The draw off takes and stop cocks shall then be closed and specified hydraulic pressure shall be applied gradually. Pressure gauge must be accurate and preferably should have been recalibrated before the test. The test pump having been stopped the test pressure should maintain without loss for at least half an hour. The pipes and fittings shall be tested in sections as the work of laying proceeds, keeping the joints exposed for inspection during the testing.

Mode of measurement

a. The pipes laying shall include all fittings and accessories all proper jointing, painting with anti corrosive paints and testing of pipes shall be paid under this item.

b. Nothing extra shall be paid for the sand bed of 7.5 cm thick laid below the pipe and 15 cm above for underground pipes.

c. High thrust blocks of CC 1:2:4, if provided shall be paid under relevant concrete item.
11.02 Providing & Laying under ground GI pipe line for 75mm dia
-DO- same as item 11.01 a).

11.03 Providing & Laying GI pipe 50mm dia under ground
-DO- same as item 11.01 a).

11.04 Providing & Laying GI pipe 38mm dia under ground
-DO- same as item 11.01 a).

11.05 Providing & Laying GI pipe 25mm dia under ground
-DO- same as item 11.01 a).

11.06 Providing & Laying open GI pipe line 100mm dia
For open line work the galvanized iron pipes and fittings shall run along the surface of the walls, ceiling, structure (not in chase) unless otherwise specified. The fixing shall be done by means of standard pattern holder bat clamps, keeping the pipes about 1.5 cm clear of the walls, ceiling. Pipes may be fixed in the ducts or recesses etc. provided there is sufficient space to work on the pipes with the usual tools.

All pipes & fittings shall be fixed truly vertical & horizontal unless unavoidable. The pipes shall be fixed to walls with standard pattern holders bat clamps of required shape and size so as to fit tightly on the pipes when tightened with screwed bolts. The clamps shall be fixed at short length and near the fittings as directed by the Engineer. The pipe line shall be tested as specified in item 11.01.

Mode of Measurement

GI pipes with fittings completely fixed in position shall be measured & paid for the finished center line lengths. The rate shall include providing and laying the pipe line with all necessary specials in open, properly fixing it with clamps & testing the line all complete.

11.07 Providing & Laying open GI pipe line 75mm dia
-DO- same as item 11.06).

11.08 Providing & Laying open GI pipe line 50mm dia
-DO- same as item 11.06).

11.09 Providing & Laying open GI pipe line 38mm dia
-DO- same as item 11.06).

11.10 Providing & Laying open GI pipe line 25mm dia
-DO- same as item 11.06).

11.11 Providing & Laying open GI pipe line 20mm dia
-DO- same as item 11.06).
11.12 Providing & Laying open GI pipe line 12mm dia  
-DO- same as item 11.06).

11.13 a) Providing & Laying concealed in structure GI pipe line 38mm dia  
For internal work the pipes shall be concealed in the brick masonry. Chasses or zarries shall be cut in the walls & the pipes shall be laid. The pipes shall not ordinarily be buried in solid floors. Where unavoidable pipes may be buried for short distances provided adequate protection is given against damage, but the joints in pipes shall not be buried. Where directed by the Engineer MS sleeve shall be fixed at a place where a pipe is passing through a wall or floor for inception of the pipe & to allow freedom for expansion movements and contraction and other. In case the pipe is embedded in walls or floors it should be painted with anticorrosive bituministic paint of approved quality. The pipe should not come in contact with lime mortar or lime concrete as the pipe shall be laid in layer of sand filling done under concrete floors or as directed by the Engineer. The floor and wall shall be finished same as the surrounding surface after the completion of the work. The line shall be tested as specified in the item 11.01.

Mode of Measurement

GI pipes with fittings laid properly shall be measured along the centre line lengths. The rate shall include making zarries in the wall, cutting floor, making holes, painting the pipe line with anticorrosive bituministic paint all complete.

11.14 Providing & Laying concealed in structure GI pipe line 25mm dia  
-DO- same as item 11.13).

11.15 Providing & Laying concealed in structure GI pipe line 20mm dia  
-DO- same as item 11.13).

11.16 Providing & Laying concealed in structure GI pipe line 12mm dia  
-DO- same as item 11.13).

11.17 Providing and fixing Sluice valve for 100mm dia pipe line  
It shall be of approved quality. It shall be measured in nos.

11.18 Providing and fixing Sluice valve for 75mm dia pipe line  
-DO- same as item 11.17).

11.19 Providing and fixing Sluice valve for 50mm dia pipe line  
-DO- same as item 11.17).

11.20 Providing and fixing Sluice valve for 38mm dia pipe line  
-DO- same as item 11.17).
11.21 Providing and fixing Sluice valve for 25mm dia pipe line

-Do- same as item 11.17).  

11.22 Providing and fixing Sluice valve for 12mm dia pipe line 

-Do- same as item 11.17).  

11.23 Providing & fixing of half turn lever operated valve of approved quality for 25 mm dia pipe line.

It shall be of approved ISI make. It shall be fixed in the pipe line at the place as directed by the Engineer. 

Mode of Measurement

It shall be measured in nos. The rate shall include providing & fixing of the valve as directed.  

11.24 Providing & fixing of half turn lever operated valve of approved quality for 12 mm dia pipe line.

The specification same as item no. 11.23  

11.25 Providing & Fixing Bib cock for 15mm dia pipe line

A bibcock (biptap) is a draw off tap with horizontal inlet & free outlet. It shall be of specified size & shall be of the screw down type. The closing device should work by means of a disc carrying a renewable non-metallic washer, which shuts against water pressure on a seating at right angles to the axis of the threaded spindle which operates it. The handle shall be either catch or butterfly type securely fixed to the spindle. The cocks shall open in anti-clockwise direction. When the bib cocks are required to be chromium plated the chromium plating shall be of grade B type conforming to IS:1068. In finish & appearance, the plated articles shall be free from plating defects such as blister, pits, roughness and shall not be stained or discolored.  

Mode of Measurement

It shall be measured in nos.  

11.26 Providing and fixing long body bib cock. 

The specifications same as item no. 11.25 but the bib cock shall have long body which are generally provided for the kitchen sink. 

It shall be measured in no.
11.27 P&F stop cock for 12mm dia pipe line

A stopcock (stop tap) is a valve with a suitable means of connections for insertion in a pipe line for controlling or stopping the flow. It shall be of specified size & shall be of the screw down type. The closing device should work by means of a disc carrying a renewable non-metallic washer, which shuts against water pressure on a seating at right angles to the axis of the threaded spindle which operates it. The handle shall be either catch or butterfly type securely fixed to the spindle. Valve shall be of the loose letter seated pattern. The cocks shall open in anti-clockwise direction. When the stop cocks are required to be chromium plated the chromium plating shall be of grade B type conforming to IS:1068. In finish and appearance, the plated articles shall be free from plating defects such as blister, pits, roughness & shall not be stained or discolored.

Mode of Measurement

It shall be measured in nos.

11.28 Providing & fixing Angle valve

The brass fittings shall be of heavy quality, CP and approved manufacture and pattern with screwed or flanged ends as specified. The fittings shall in all respects comply with the requirements of IS:781. The standard size of brass fittings shall be designated by the normal bore of the pipe to which the fittings are attached. A sample of each kind of fittings shall be got approved from the Engineer and all supplied made according to the approved samples. All cast fitting shall be sound and free from lumps pot holes and both internal and external surfaces shall be clean, smooth and free from sand etc. Burring, plugging stopping or patching of the casting shall not be permitted. The bodies, spindles and other parts shall be truly machined or that when assembled the points shall be axial, parallel and cylindrical with surface smoothly finished. The area of the water way of the fittings shall not be less than the areas of the nominal bore. The fittings shall be fitted in the pipe line in a workman like manner. The joints between fittings and pipes shall be made leak proof. The joints and fittings shall be leak proof when tested to a pressure of 6 Kg/sq.cm and the defective fittings and joints shall be replaced or redone.

Mode of Measurement

It shall be measured in nos. The rate shall include providing and fixing of angle valve with the disc. all complete.

11.29 Providing & Fixing CI manhole cover of 40 Kg, 80 Kg, 110 Kg.

This shall be of approved make. The cover shall be provided on a CI frame. The frame shall be properly fixed in the brick work/RCC cover slab of the chamber.

Mode of Measurement

This shall be measured in no.
11.30 Providing and Fixing GI water spout of 50 mm dia.

The spout shall be 200 to 450 mm in length as directed by the Engineer. One end of the pipe shall be cut diagonally & tack welded at the bottom to facilitate the flow of water. It shall be fixed at places as directed by the Engineer. The brickwork after the placement of the spout shall be finished properly to match the external finish. The spout shall be painted with paint of approved shade and make.

Mode of Measurement

This shall be measured in no. The rate shall be quoted for providing and fixing water spout in RCC or brick work specified above.

11.31 Providing and Fixing GI water spout of 38 mm dia.

The specification same as item no. 11.30

11.32 Providing & Fixing 100mm dia GI hydrant

The work shall be carried out as per the drawing and as directed. It shall be provided with a wheel valve & a vertical piece of GI pipe to keep the hydrant level above the existing GL at a height as directed by the Engineer. The hydrant shall be fixed in a brick chamber of size 450x450 mm and depth 230 to 500 be finished with PCC 1:4:8 100mm thick and the walls shall be finished with 12mm thick plaster in CM 1:4. An MS cover shall be provided for the chamber.

Mode of Measurement

It shall be measured in nos. The rate shall be for providing the hydrant and connecting it to the main line with required specials, providing and fixing wheel valve and GI pipe piece in a chamber a specified above.

11.36 Providing & Fixing shower rose

This shall be of approved make. This shall be fixed properly as directed by the Engineer.

Mode of Measurement

It shall be measured in nos.

11.38 Providing & Fixing 6mm thick asbestos string for 25mm dia line

This shall be wound closely over the GI pipe concealed in structure.

Mode of Measurement

This shall be measured in RM of the pipe treaded as above.

11.39 Providing & Fixing 6mm thick asbestos string for 12mm dia line

The specifications same as item no. 11.38
11.40 Providing & fixing Towel rail

This shall be brass chromium plated or as specified and of approved make. The length shall be between 500 and 800 mm and the rod shall be of 20mm dia. It shall be fixed as directed by the Engineer.

Mode of Measurement

It shall be measured in nos.

SECTION 12.00 SANITARY WORKS

Scope of work

The scope of work includes providing and fixing sanitary fixtures, providing and laying drainage lines and all items of work described in Schedule of Quantities.

Drawings

Checked and approved drawings showing location of sanitary & water supply fixtures will be furnished to the Contractor & all drawing so furnished shall form a part of this specification. The Contractor shall refer these drawings for all information contained thereon which pertains to and required for this work.

In the case of variations between the drawings & the specifications or discrepancies in the information furnished by the Engineer, the Contractor shall refer such discrepancies to the Engineer before proceeding with such work.

All connected works will be measured and paid under respective items of work unless specifically mentioned otherwise.

12.01 Providing & laying stoneware pipe of 300mm dia

All pipes with spigot & socket ends shall conform to IS 651 and shall be of grade ‘A’ as specified. These shall be sound free from visible defects such as fire cracks or hair cracks. The glaze of the pipe shall be free from crazing. The pipes shall gave a sharp clear sound when struck with a light hammer. There shall be no broken blisters. The approximate thickness of 60 cm long pipes shall be as given in the table.

<table>
<thead>
<tr>
<th>Internal diameter of the pipe (mm)</th>
<th>Thickness the barrel &amp; socket (mm)</th>
<th>Weight of each pipe per M kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>150</td>
<td>16</td>
<td>22</td>
</tr>
<tr>
<td>200</td>
<td>17</td>
<td>33</td>
</tr>
<tr>
<td>230</td>
<td>19</td>
<td>44</td>
</tr>
<tr>
<td>250</td>
<td>20</td>
<td>52</td>
</tr>
<tr>
<td>300</td>
<td>25</td>
<td>79</td>
</tr>
<tr>
<td>350</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>400</td>
<td>35</td>
<td>128</td>
</tr>
<tr>
<td>450</td>
<td>38</td>
<td>147</td>
</tr>
</tbody>
</table>
The length of pipes shall be 60 cm exclusive of the internal depth of the socket. The pipe shall be handled with sufficient care to avoid damage to them.

All pipes shall be laid on a bed of 15 cm cement or lime concrete as specified, projecting on each side of the pipe to the width of the trench which shall be nominal dia of pipe + 400 mm. The pipes with their crown level at 1.20 m depth and less from ground shall be covered with 15 cm thick concrete above the crown of the pipe and sloped off to meet the outer edges of the concrete, to give a minimum thickness of 15 cm around the pipe. Pipes laid at a depth greater than 1.20 m at crown shall be concreted at the side up to the level of the center of the pipe and sloped off from the edges to meet the pipe tangentially. The concreting shall be done as per specifications for concrete. The pipes shall be carefully laid to the alignment levels and gradients shown on the plans and sections great care shall be taken to prevent sand etc. from entering the pipes. The pipes between two manholes shall be laid truly in a straight line without vertical or horizontal undulation. The pipe shall be laid with socket up the gradient. The body of the pipe shall for its entire length rest on an even bed of concrete and places shall be formed in the concrete to receive the socket of the pipe.

Where pipes are not bedded on concrete the trench floor shall be left slightly high and carefully bottomed up as pipe laying proceeds, so that the pipe barrels rest on firm and undisturbed ground. If the excavation has been carried to low the desired levels shall be made up with concrete 1:5 10 (1 cement: 5 coarse sand : 10 graded brick bat of 40 mm nominal size for which no extra payment shall be made.

If the floor of the trench consists of rock or very hard ground that cannot easily be excavated to a smooth surface the pipe shall be laid on a leveling course of concrete as desired. When SW pipes are used for storm water drainage, no concreting will normally be necessary. The cement mortar for jointing will be 1:3 (2 cement: 3 fine sand) testing of joints will also not be done.

Tarred gasket of hemp yarn soaked in thick cement slurry shall first be placed round the spigot of each pipe and the spigot shall then be slipped home well into the socket of the pipe previously laid. The pipe shall then be adjusted and fixed in the correct position and the gasket caulked tightly home so as to fill not more than 1/4th of the total depth of the socket.

The reminder of the socket shall be filled with stiff mixture of cement mortar in the proportion of 1:1 cement 1 fine sand when the socket is filled, a fillet shall be formed round the joint with a trowel having any angle of 45 with the barrel of the pipe. After a day's work any extraneous material shall be removed from the inside of the pipe. The rely made joints shall be cured.

Water test

a. Stoneware pipes used for sewers shall be subjected to a test pressure of 1.5 m head of water at the highest point of the section under test. The test shall be carried out by suitably plugging the low end of the drain and the ends of the connection if any filling the system with water. A buckle bend shall be temporarily jointed in at the top end and a sufficient length of vertical pipe jointed to it so as to provide the required test head. Or the top may be plugged with a connection to a hose ending in a funnel which could be raised or lowered till the required head is obtained and fixed suitably for observation. Where leakage will be visible the defective part of the work shall be removed and made good.
In cases where pipes are not bedded on concrete special care shall be taken in refilling trenches to prevent the displacement & subsequent settlement at the surface resulting in uneven street surfaces and dangers to foundations etc. The backfilling materials shall be packed by hand under and around the pipe, and rammed with a shovel and light tamper. The method of filling will be continued up to the top of pipe. The refilling shall rise evenly on both sides of the pipe continued up to 60 cm above the top of pipe so as not to disturb the pipe. No tamping should be done within 15 cm of the top of pipe. The remainder of the backfill shall not be done until 7 days have elapsed for brick sewers and 14 days of concrete sewers, unless local conditions or materials are suitable for the earlier placing of load on the pipes. The tamping shall become progressively heavier as the depth of the backfill increases. In measuring the length of sewer pipes, laid length between faces of manholes shall only be measured omitting lengths of channels between inside faces of walls of manholes or chambers.

Mode of measurement

a. Providing & laying of pipes, The cement concrete bed provided for the pipes jointing as per above specifications and testing of pipes which carry waste water and sewage all shall be paid in RM under this item.

b. The concrete provided for hunching shall be paid under the respective concrete item.

12.02 Providing & Laying Stoneware pipe of 230mm dia
-DO- same as item 12.01).

12.03 Providing & Laying Stoneware pipe of 150mm dia
-DO- same as item 12.01).

12.04 Providing & Laying stoneware pipe of 100mm dia
-Do- same as item 12.01).

12.07 Providing & Fixing Stainless Steel Sink with drain board.

It shall be of approved make. It shall be provided with fittings & specials like CI brackets, overflow, rubber plugs, CP brass chain, 31 mm dia CP brass waste pipe. The brackets shall be painted with two coats of synthetic n enamel paint.

12.08 Providing & Constructing SW 100mm dia gully trap

SW gully trap for 100/150mm dia pipe shall be fixed in a chamber of 230 thick wall of size 300x300 mm, 12mm thick plaster in CM 1:4 inside, 100mm thick PCC 1:4:8 bed shall be laid over that 38mm thick IPS flooring shall be provided and finished properly. The chamber shall be provided with a CI frame and cover.

Mode of Measurement

It shall be measured in nos. The unit rate shall include all works necessary for the item as specified above.
12.09 Providing & Fixing 100 mm HCI nahni trap

The tap shall be painted with anticorrosive paint & fixed in position with PCC 1:2:4 (1 cement, 2 sand, 4 graded coarse aggregate of nominal size 20 mm & down) The brass CP jali shall be placed over the trap. The flooring around the trap shall be properly finished.

Mode of Measurement

This shall be measured in nos.

12.10 Providing & Fixing 150 mm HCI nahni trap

- Do - as same item no. 12.09

12.11 Providing & Constructing Man holes.

Manholes of different types and sizes as specified shall be constructed in the sewer line at such places & to such levels & dimensions as shown in the drawings or as directed by the Engineer. The size indicate the inside dimensions of the manhole.

Excavation and back filling shall be as per respective specifications.

Manhole shall be built on a bed of brickbat cement concrete 1:4:8 (1 cement : 4 sand : 8 brickbats of 40 mm nominal size). The thickness of the bed concrete shall be 150 mm unless otherwise specified. Brick work shall be in cement mortar 1:6 (1 cement : 6 sand). The external joints of the brick masonry shall be finished smooth. The joints of the pipes with the masonry shall be made perfectly leak-proof with cement concrete 1:2:4.

The brick walls of the manholes shall be plastered inside with 12mm thick cement plaster 1:4 (1 cement : 4 sand finished smooth with a floating coat of neat cement. Channels & benching shall be in cement concrete 1:2:4 (1 cement : 2 sand : 4 graded stone aggregate)

The depth of channels and benching shall be as indicated in the table given below:

<table>
<thead>
<tr>
<th>Size of drain mm</th>
<th>Top of channel at the centre above bed concrete cm</th>
<th>Depth of benching at side walls above bed concrete cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>150</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>200</td>
<td>25</td>
<td>35</td>
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<tr>
<td>250</td>
<td>30</td>
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<td>300</td>
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<tr>
<td>400</td>
<td>45</td>
<td>55</td>
</tr>
<tr>
<td>450</td>
<td>50</td>
<td>60</td>
</tr>
</tbody>
</table>
All manholes dipper than 1.0 m shall be provided with CI foot rest. These shall be embedded 20 cm deep with 20x20x10 cm blocks of cement concrete 1:2:4 (1 cement : 2 sand : 4 graded stone aggregate). The block with CI foot rest placed in its centre shall be cast-in-situ along with the masonry & the surface finished with 12 mm thick cement plaster 1:4 (1 cement : 4 sand) finished smooth. Foot rests shall be fixed 30cm apart vertically & staggered laterally & shall project 10 cm beyond the surface of the wall. The top foot rest shall be 45cm below the manhole cover. Foot rests shall be painted with coal tar, the portion embedded in cement concrete block painted with thick cement slurry before fixing.

CI manhole covers & frames shall conform to IS:1726. The covers & frames shall be cleanly cast & they shall be free from air & sand holes & from cold struts. They shall be neatly dressed and carefully trimmed. All casting shall be free from voids whether due to shrinkage, gas inclusion or other causes. Cover shall have a raised chequered design on the top surfaces to provide an adequate non slip grip. The cover shall be capable of easy opening & closing it shall be fitted in the frame in workmanship like manner. The cover shall be gas tight and water tight.

Covers & frames shall be coated with a black bituminous paint. It shall not flow when exposed to a temperature of 63 Deg. Cent. and shall not be brittle as to chip off at temperature of 0 Deg. Cent.

Manhole cover and frame shall conform to medium duty 500 mm internal diameter and shall weight not less than 75kg unless otherwise mentioned in the item description. (weight of cover 58 kg and weight of frame 58 kg).

Manholes shall be measured in numbers. The depth of the manhole shall be reckoned from top level of CI cover to the invert levels of channel. The depth shall be measured correct to centimeters.

Sewers of unequal sectional area shall not be jointed at the same invert level in a manhole. The invert of the smaller sewer at its junction with main shall be, at a height at least 2/3 the diameter of the main, above the invert of the main. The branch sewer should deliver sewage in the manhole in the direction of main flow and the junction must be made with care so that flow in the main is not impeded. No drains from house fittings e.g. GT, soil pipe etc. exceeding a length of 6m shall be connected unless it is inevitable.

The frame of the manhole cover shall be firmly embedded to correct alignment and levels in plain cement concrete 100 mm thick 1:2:4 (1 cement : sand : 4 graded stone aggregate) on top of the brick masonry. After completion of the work manhole covers shall be smeared by means of thick grease.

Mode of Measurement

It shall be measured in no.

12.11 providing & Constructing inspection chambers size 600x600mmx1.0metre.

12.12 Providing & Constructing inspection chambers size 1000x1000mmx1.0/1.5metre.

-DO- same as item no 12.11
12.13 Providing & Constructing inspection chambers size 1200x1200mmx1.5/2.0metre.

-DO- same as item no 12.11

12.14 Providing & Laying Open PVC rain water line 150mm dia

The strength of the pipe shall be 4kg/sqcm. It shall be of approved make. It shall be provided with all necessary specials. It shall be jointed with adhesive as per the manufacturer's specifications.

Mode of Measurement

It shall be measured in RM. The rate shall include providing the specified quality of pipe with necessary specials, cutting the walls and making them good after the laying, jointing with adhesives all complete.

12.15 Providing & Laying Open PVC rain water line 100mm dia

-DO- same as item 12.14).

12.16 Providing & Construction Soak Pit.

The earth excavation shall be carried out to the exact dimensions as shown in the drawing. The soak pit shall be constructed of honey-comb dry brick work of 250mm thick in cement mortar 1:6, filled with brick bat upto height as specified RCC 1:2:4 precast or cast-in-citu slabs 150 mm thick for top cover with reinforcement. CI manhole cover 500 mm dia of 80 Kg. weight, 150 mm dia sw tee, outlet vent, 75 mm dia CI pipe, 2 m high fixed on masonry pedestal with cowl and bituminastic painting, refilling, watering, consolidating etc., all complete.

Mode of Measurement

All above mentioned works shall be measured under the respective Traders & items as given in the Schedule of Quantities.

12.17 Providing and Constructing Septic tank

Septic tanks shall be built as per the drawings. The cost of all works such as excavation backfilling, concrete, reinforcement etc., shall be paid under the respective items included in the specification.

Mode of Measurement

The various works involved shall be measured and paid for in the respective trade as given in the Schedule of Quantities.

12.28 Providing & Fixing Indian type WC/Orissa pan

This shall be the long pan pattern with footrests/Orissa pattern, as specified, made of white glazed vitreous china or of white glazed fire clay. Each pan shall have an integral flushing rim of suitable type. It shall also have an inlet or supply horn for connecting the flush pipe. The flushing rim and inlet shall be of the self draining type. It shall have a weep hole at the flushing inlet to the pan. The flushing inlet shall be in the front unless otherwise specified or ordered by the Engineer. The inside of the bottom of pan shall have sufficient slope from the front towards the outlet & the surface shall be uniform & smooth to enable easy & quick disposal while flushing. The exterior surface of the outlet below the flange
shall be an unglazed surface which shall have grooves right angles to the axis of the outlet. Pans shall be provided with a trap `P' or `S' type with vent horn etc. complete.

Mode of Measurement

It shall be measured in nos. The rate shall include the providing & fixing of the footrests also.

12.29 Providing & Fixing large flat back urinal

Urinals shall be of flat back or corner wall type lipped in front as specified in the item description in the Schedule of Quantities. They shall be of white glazed earthenware, white glazed vitreous china or white glazed fire clay & of size as specified. Each urinal shall be of one piece construction. Each urinal shall be provided with not less than two fixing holes of a minimum dia of 6.5 mm on each side. Each urinal shall have an integral flushing rim of suitable type and inlet or supply horn for connecting the flush pipe. The flushing rim & inlet shall be of the self draining type. It shall have a weep hole at the flushing inlet of the urinal. At the bottom of the urinal, an outlet for connecting to an outlet pipe shall be provided. The exterior of the outlet horn shall not be glazed & the surface be provided with grooves at right angles to the axis of the outlet to facilitate fixing to the outlet pipe. The inside surface of the urinal shall be uniform & smooth throughout to ensure efficient flushing. The bottom of pan shall have sufficient slope from the front, towards the outlet such that there is efficient draining of the urinal. The waste fittings shall be chromium plated. Also CP brass spreader & pipe of ø100mm dia shall be provided.

Mode of Measurement

It shall be measured in nos. The rate shall include CI brackets & screws, CP brass spreader pipe etc. all complete. The bottle trap if asked to be provided, it shall be measured in nos and paid for separately.

12.30 Providing & Fixing Wash basin

Wash basins shall be of white glazed earthenware, white glazed vitreous china or white glazed fire clay as specified. These shall be of the following type & sizes indicated against each type:

<table>
<thead>
<tr>
<th>Types</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat back</td>
<td>630x450 mm</td>
</tr>
<tr>
<td>Flat back counter top with antis splash rim</td>
<td>530x430 mm</td>
</tr>
</tbody>
</table>

b. Wash basins shall be of one piece construction, including a combined overflow. All internal angles shall be designed so as to facilitate cleaning. Each basin shall have a rim on all sides except sides in contact with the walls & shall have skirting at the back. Basins shall be provided with single or double tap holes as specified. The tap holes shall be square. A suitable tap hole button shall be supplied if one tap hole is not required in installation. Each basin shall have a circular waste hole to which the interior of basin shall drain. The waste hole shall be either rebated or be beveled internally with diameter of 63mm at top and a depth of 10 mm to suit a waste plug having 64 mm diameter. Each basin shall be provided with a non-ferrous 32 mm washer fitting. Stud bolts to receive the brackets on the underside of the wash
basins shall be suitable for a bracket with stud not exceeding 13mm diameter 5 mm high and 305 mm from the back of basin to the centre of the stud. The stud slots shall be of depth sufficient to take 5mm stud every basin shall have an integral holder recess or recesses which shall fully drain into the bowl. The position of the chain stay hole shall not be lower than the over flow slot. A slot type overflow having an area of not less than 5 sq cm shall be provided and shall be so designed as to facilitate cleaning of the overflow. The specifications for waste plug, chain and stay shall be the same as given for sinks.

c. All the waste fittings shall be chromium plated bottle trap conform to IS:5434 the chromium plating shall be of grade B type conforming to IS:1068. Also CI brackets shall be provided with screws.

Mode of Measurement

It shall be measured in nos. The rate shall be quoted for providing and fixing wash basin as specified above.

12.30 Providing & Fixing oval type Wash basin

[ii] The specifications are same as item no. 12.30 [i].

Mode of Measurement

It shall be measured in nos.

12.35 Providing & Fixing Flush valve

It shall be approved make.

Mode of Measurement

It shall be measured in nos.

12.37 Providing & fixing bottle trap

It shall be of heavy duty approved quality and make. It shall be provided with necessary connecting pipe, wall flange etc.

Mode of Measurement

This shall be measured in nos.

12.38 Providing & Fixing paper holder.

It shall be of approved quality. It shall be glazed white vitreous china recessed type. It shall have a wooden roller or alluminium or as specified and a roll of paper.

Mode of Measurement

This shall be measured in nos.

12.43 Providing & Fixing Soap Dish.

It shall be of approved quality. It shall be measured in nos.
12.44 Providing & fixing 450x600 mm size mirror.

This shall be fixed in approved quality plywood including screw, two coats of redoxide etc. shall be measured in nos.

12.45 a) Providing & Laying 300mm dia non-pressure hume pipe

The pipe shall be with or without reinforcement as required & of the class as specified. These shall conform to IS:458. The reinforced cement concrete pipes shall be manufactured by centrifugal (or spun) process while unreinforced cement concrete pipes by spun or pressure process. All pipes shall be true to shape, straight, perfectly sound and free from cracks and flaws, the external and internal surface of the pipes shall be smooth and hard. The pipes shall be free from defects resulting from imperfect grading of the aggregate pressure pipes) shall withstand a test pressure equivalent to 0.7 kg/sq.cm (7 m head) of water.

Concrete used for the manufacture of unreinforced & reinforced concrete pipes & collars shall not be leaner than 1 2:4 (1 cement : 2 coarse sand :4 graded stone aggregate). The max. size of aggregate should not exceed one third of the thickness of the pipe or 20 mm whichever is smaller. The reinforcement in the reinforced concrete pipes shall extend throughout the length of the pipe. The circumferential & longitudinal reinforcements shall be adequate to withstand the specified hydrostatic pressure & further bending stresses due to the weight of water when running full across a span equal to the length of pipe plus three times its own weight. The minimum cover for reinforcement of spun pipes and for all other pipes shall be as given below:

<table>
<thead>
<tr>
<th>Pipes thickness</th>
<th>Spun pipes</th>
<th>Pipes other than spun pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 30 mm</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>30 mm to 75 mm</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>75 mm and over</td>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>

Where the pipe shall be bedded directly on soil, the bed shall be suitably rounded to fit the lower part of the pipe the cost for this operation being included in the rate for laying the pipe.

Loading, transporting, and unloading of concrete pipes shall be done with care. Handling shall be as to avoid impact. Gradual unloading by inclined plane or by chain block is recommended. All pipe sections and connections shall be inspected carefully before being laid. Broken or defective pipes or connections shall not be used. Pipes shall be lowered into the trenches carefully mechanical appliances may be used pipes shall be laid true to the line and grade as specified laying of pipe shall proceed upgrade of a slope.
If the pipe have spigot and socket joints, the socket ends shall face up-stream. In the case of pipes with joints to be made with loose collars, the collars shall be slipped on before the next pipe is laid. Adequate and proper expansion joints shall be provided where directed.

In case where the foundation conditions are unusual such as in the proximity of trees or holes under existing or proposed tracks, manholes etc. the pipe shall be encased all-round in 15 cm thick cement concrete 1:5:10 (1 cement : 5 coarse sand 10 graded stone aggregate 40 mm nominal size) or compacted sand or gravel.

In cases where the natural foundation is inadequate the pipes shall be laid either in concrete or cradle supported on proper foundations or on any other suitably designed structure. If a concrete cradle bedding is used the depth of concrete below the bottom of the pipe shall be at least 1/4th of the internal dia of the pipe subject to a minimum of 10 cm and a max. of 30 cm. The concrete shall extend up the sides of the pipes at least to a distance of 1/4th of the outside diameter for pipes 300 cm and over in diameter. The pipe shall be laid in this concrete bedding before the concrete has set. Pipes laid in trenches in earth shall be bedded evenly and firmly and as far up the haunches of the pipes as to safety transit the load expected from the backfill through the pipe to the bed. This shall be done either by excavating the bottom of the trench to fit the curve of the pipe or by compacting the earth under the curve of the pipe to form an even bed. Necessary provision shall be made for joint wherever required. When the pipe is laid in a trench in rock, hard clay, shale or other hard material the space below the pipe shall be excavated and replaced with an equalizing bed of concrete sand or compacted earth. In no case shall pipe be laid directly on such hard material. When the pipes are laid completely above the ground the foundations shall be made even and sufficiently compacted to support the pipe line without any material settlement. Alternatively the pipe line shall be supported on rigid foundations at intervals. Suitably arrangements shall be made to retain the pipe line in the proper alignment such as by shaping the top of the supports to fit the lower part of the pipe. The distance between the supports shall in no case exceed the length of the pipe. The pole shall be supported as far as possible close to the joints. In no case shall the joint come in the centre of the span. Care shall be taken to see that superimposed loads greater than the total load equivalent to the weight of the pipe when running full shall not be permitted. Suitably designed anchor blocks at change of directions and grades for pressure lines shall be provided where required.

Jointing of the pipes shall be done as described below:

a. Collar shall be spaced symmetrically over the two pipes and the space between collar and pipe filled with cement mortar 1:1 thoroughly rammed with caulking tools. The joint shall be finished with a fillet sloping at 45. Joints shall be protected and cured for about 10 days. If specified in the item specification wedge shaped groove in the end of the pipe shall be filled with a special bituminous plastic compound for bitumen soaked spun yarn. The collar shall then be slipped over the end of pipe and next pipe butters well against tee plastic compound by suitably appliance so as to compress the plastic compound in the grooves, care being taken not to disturb concentricity and level of the pipes.
Mode of measurement

a. Providing and laying of pipe links, rounding off the bed to fit the lower part of the pipe, jointing of pipes all shall be paid in RM under this item.

b. The concrete bed and blocks of CC 1:2:4 provided at junction shall be paid under concrete work.

c. Providing & Laying 230 mm dia non-pressure hume pipe
   -DO- same as item 12.45 a).

d. Providing & Laying 150 mm dia non-pressure hume pipe
   -DO- same as item 12.45 a).

SECTION 13.00 ALLUMINIUM WORKS

Detailed specifications shall be as per Schedule of Quantities.

Section IX. Drawings

LIST OF DRAWING (ARCHITECTURAL)

<table>
<thead>
<tr>
<th>DRG.NO</th>
<th>TITLE</th>
<th>COPY</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>MAIN CAMPUS SITE LAYOUT PLAN</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>MAIN PLANT</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>SUN DRYING YARD</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>MOLASIS TANK</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>FODDER BUNKER</td>
<td></td>
</tr>
</tbody>
</table>
Section X : BILL OF QUANTITIES

Objectives

The objectives of the Bill of Quantities are:

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

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

General Notes:

1. Item for which no rate or price has been entered in will not be paid for by the Employer when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities (refer :ITB Clause 14.2 and GCC Clause 41.3)
2. Unit rates and prices shall be quoted by the bidder in Indian Rupees [ITB Clause 14.1]
3. Where there is a discrepancy between the rate in figures and words, the rates in words will govern.[ITB Clause 28.1(a)]
4. Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by quantity, the unit rate quoted shall govern [ITB Clause 28.1(b)].

Technical Notes:

1. Soak pit / Soak well, Drop chamber, Road gully chamber, Manhole chamber, Septic tank etc included in technical specifications and shall be paid under individual tender items of the tender in different trades as applicable.
2. Scaffolding/staging, lift, lead etc. is inclusive for all the items required to be executed under the Schedule of Quantities of this contract even if not mentioned in an item.
3. Bidders to build a small, low cost but safe site office & store; 3mx10mx 3m high at our site at no extra cost.
4. For water supply for construction the successful bidder to drill & install one small tube well at our site at no extra cost OR if supplied by employer then 0.5 % of total work value will be deducted from bills.
5. The Quantity can increase or Decrease.
6. For electricity the successful bidder has to make his own arrangement OR if supplied by employer then 0.5 % of total work value will be deducted from bills.

Necessary authority letters if required will be provided by the purchaser.

ON COMPLETION OF WORK items indicated under note3 & 4 become the property of the purchaser.
Section XI. Security Forms

Samples of acceptable forms of Bid, Performance, and Advance Payment Securities are provided in this Section XI. Bidders shall not complete the Performance and Advance Payment Security forms at this stage of the procurement process. Only the successful Bidder shall be required to provide these two securities.

Forms of Securities

Acceptable forms of securities are annexed. Bidders should not complete the Performance and Advance Payment Security forms at the time. Only the successful Bidder will be required to provide Performance and Advance Payment Securities in accordance with one of the forms, or in a similar form acceptable to the Employer.

Annex A : Bid Security (Bank Guarantee) Annex B :

Performance Bank Guarantee

Annex B1 : Performance Bank Guarantee for Unbalanced Items Annex C :

Bank Guarantee for Advance Payment
Form of Bid Security (Bank Guarantee)-Annexure A

WHEREAS, [name of Bidder] (hereinafter called “the Bidder”) has submitted his Bid dated [date] for the construction of Civil work for Straw enrichment & Densification Plant at Mudshingi, Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur (hereinafter called “the Bid”).

KNOW ALL PEOPLE by these presents that We [name of bank] of [name of country] having our registered office at [bank address] (hereinafter called “the Bank”) are bound unto Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur [name of Employer] (hereinafter called “the Employer”) in the sum of [amount] for which payment well and truly to be made to the said Employer the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this ______ day of ______ 19____.

THE CONDITIONS of this obligation are:

(1) If after bid opening the Bidder withdraws his bid during the period of Bid validity specified in the Form of Bid;

Or

(2) If the Bidder having been notified of the acceptance of his bid by the Employer during the period of Bid validity:

(a) fails or refuses to execute the Form of Agreement in accordance with the Instructions of Bidders, if required; or
(b) fails or refuses to furnish the Performance Security, in accordance with the Instruction to bidders; or
(c) does not accept the correction of the Bid Price pursuant to Clause 28.

The Bidder should insert the amount of the guarantee in words and figures denominated in Indian Rupees. This figure should be the same as shown in Clause 16.1 of the Instructions of Bidders.
We undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or any of the three conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date ________20 days after the deadline for submission of Bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not later than the above date.

DATE __________   SIGNATURE OF THE BANK______________________

WITNESS_________   SEAL__________________

_________________________________________________________________

[Signature, name and address]

20 45 days after the end of the validity period of the Bid.
Performance Bank Guarantee ANNEXURE B

To: Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur

At Kolhapur

WHEREAS _______________[name and address of Contract] (hereinafter called “the Contractor”) has undertaken, in pursuance of Contract No. 1-GANGANAGAR dated_________ to execute: Civil work for Straw enrichment & Densification Plant at Mudshingi, Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur (hereinafter called “the Contract”):

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

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

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

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

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

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

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

Signature and seal of the guarantor___________________

Name of Bank_______________________________

Address_______________________________

Date ________________________________
PERFORMANCE BANK GUARANTEE (for unbalanced items)-ANNEXURE B1

To Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur

[Name of Employer]

Kolhapur [address of Employer]

WHEREAS ____________________ [name and address of Contract] (hereinafter called “the Contractor”) has undertaken, in pursuance of Contract No.1 dated ___________ to execute Civil work for Straw enrichment & Densification Plant at Mudshingi, Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur (hereinafter called “the Contract”);

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

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee; NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of ___________[amount of guarantee] _________ 22 _________ [in words], such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of __________ [amount of guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

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

We further agree that no change or addition to or other modification of the terms of the contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification. This guarantee shall be valid until............(i.e.) 28 days from the date of issue of the Certificate of completion of works.

Signature and seal of the guarantor___________________

Name of Bank___________________________________

Address________________________________________

Date __________________________________________

An amount shall be inserted by the Guarantor, representing the percentage of the Contract Price specified in the Contract and denominated in Indian Rupees.
BANK GUARANTEE FOR ADVANCE PAYMENT-ANNEXURE C

To: Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur

Gentlemen:

In accordance with the provisions of the Conditions of Contract, sub clause 51.1 (“Advance Payment”) of the above-mentioned Contract, __________________ (name and address of Contractor) shall deposit with Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur a bank guarantee to guarantee his proper and faithful performance under the said Clause of the Contract in an amount of ___________ (amount of guarantee) _______ [in words].

We, the __________________ (bank or financial institution), as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur on his first demand without whatsoever right of objection on our part and without his first claim to the Contractor, in the amount not exceeding ________________ (amount of guarantee) ________ [in words].

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

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

This guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until Kolhapur Zilla Sahakari Dudh Utapadak Sangh Ltd. Kolhapur receives full repayment of the same amount from the Contractor.

Yours truly,

Signature and seal of the guarantor

Name of Bank/Financial Institution

Address

Date

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Attachment (Refer ITB Clause 5.4)
Amendments for Permitting Joint Ventures

NCB – Civil Works – Document W-2 [Amendments for Joint Ventures]

In NCB contracts where it is proposed to permit JV [in the case of high value or specialized/complex works], the following corrections are to be incorporated in W-2

1. Instructions to Bidders

A. Modify clause 5.4 as under:

5.4 Bids submitted by a joint venture of two or more firms as partners shall comply with the following requirements:

(a) the bid shall include all the information listed in Sub-clause 5.3 above;

(b) the bid and, in case of a successful bid, the Agreement, shall be signed so as to be legally binding on all partners;

(c) all partners of the joint venture shall be liable jointly and severally for the execution of the contract in accordance with the contract terms, and a statement to this effect shall be included in the authorization mentioned under

(d) below, as well as in the bid and in the Agreement [in case of a successful bid];

one of the partners shall be nominated as being in charge, and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the partners;

(e) the partner in charge shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture and the entire execution of the contract, including payment, shall be done exclusively with the partner in charge;

(f) The joint venture agreement should indicate precisely the role of all members of JV in respect of planning, design, construction equipment, key personnel, work execution, and financing of the project. All members of JV should have active participation in execution during the currency of the contract. This should not be varied/modified subsequently without prior approval of the employer;

(g) The joint venture agreement should be registered in ...........* so as to be legally valid and binding on partners; and

(h) a copy of the Joint Venture Agreement entered into by the partners shall be submitted with the bid. Alternatively, a Letter of Intent to execute a joint Venture
Agreement in the event of a successful bid shall be signed by all partners and submitted with the bid, together with a copy of the proposed Agreement. [*Fill in the name of the city where contract agreement is to be signed]*

B. Substitute Clause 5.6 as under:

5.6 The figures for each of the partners of a joint venture shall be added together to determine the Bidder’s compliance with the minimum qualifying criteria of Sub-clause 5.5. However, for a joint venture to qualify each of its partners must meet at least 50 percent of the minimum criteria set in Sub-clause 5.5 above and all the partners collectively must meet the criteria specified in Sub-clause 5.5 above in full. Failure to comply with this requirement will result in rejection of the joint venture’s bid. Sub-contractor’s experience and resources will not be taken into account in determining the Bidder’s compliance with the qualifying criteria, except to the extent stated in Clause 5.5 [A] above.

C. In Sub-clause 6.1, insert words ‘either individually or as a partner in a Joint Venture’ at the end of the first sentence in Line 1.

D. In sub-clause 17.3, add the following at the end: ‘The bid security of a joint venture must define as ‘bidder’ all joint venture partners and list them in the following manner: a joint venture consisting of ‘………’, ‘………’, and ‘………’.( List names of all future partners as named in the letter of intent mentioned in ITB 5.4(h))

E. In sub-clause 35.2, add the following at the end:

‘The performance security of a Joint Venture shall be in the name of the joint venture.’

2. Qualification Information

Insert Clause 3 as under:

3. Joint Ventures

3.1 The information listed in 1 to 2.8 above shall be provided for each partner of the joint venture.

3.2 The information in 2.9 above shall be provided for the joint venture.

3.3 Attach the power of attorney of the signatory[ies] of the bid, authorizing signature of the bid on behalf of the joint venture.

3.4 Attach the agreement among all partners of the joint venture [and which is legally binding on all partners], which shows the requirements as indicated in sub-clause 5.4 of the Instructions to Bidders. Alternatively, a Letter of Intent to execute a Joint Venture Agreement in the event of a successful bid shall be signed by all partners and submitted with the bid, together with a copy of the proposed Agreement.

3.5 Furnish details of participation proposed in the joint venture as below:
DETAILS OF PARTICIPATION IN THE JOINT VENTURE

<table>
<thead>
<tr>
<th>PARTICIPATION DETAILS</th>
<th>FIRM ‘B’</th>
<th>FIRM ‘C’</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRM ‘A’ (Lead Partner)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name of the Banker(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key Personnel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Execution of Work (Give details on contribution of each partner and the controlling partner)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. General Conditions of Contract

(a) In sub-clause 49.1, add the following at the end:

‘The bank guarantee of a joint venture shall be in the name of the joint venture’.

(b) In sub-clause 50.1, add the following at the end:

‘The performance security of a joint venture shall be in the name of the joint venture’.

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