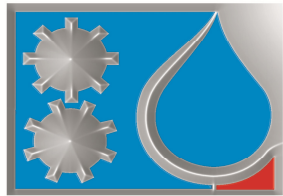


**EFFLUENT TREATMENT PLANT, EXPANSION
& MODIFICATION OF EXISTING CAPACITY
FROM 150 KLD TO NEW 200 KLD FOR DAIRY
PLANT AT PURABI DAIRY, GUWAHATI,
ASSAM**



IDMC
L I M I T E D

IDMC LIMITED
ANAND -388121

SECTION – 0

INVITATION FOR BID

**Plot no. 124-128, G.I.D.C. Estate, Vithal Udyognagar,
Anand - 388 121, Tel: 02692-220521
Website: <http://www.idmc.com>**

**INVITATION FOR BIDS (IFB) NATIONAL
COMPETITIVE BIDDING(NCB)**

**Tender/Event Ref. No: IDMC/ Sourcing & VD/ 2025-26/ Enquiry/ 290
Dated 21.08.2025**

The IDMC Ltd having its Head Office at Anand, Gujarat invites rate bids from eligible bidders through “online E- Tender” from reputed eligible bidders for **“EFFLUENT TREATMENT PLANT, EXPANSION & MODIFICATION OF EXISTING CAPACITY FROM 150 KLD TO NEW 200 KLD FOR DAIRY PLANT AT PURABI DAIRY, GUWAHATI, ASSAM”** as per details given below:

Estimated cost	Rs. 2,10,00,000/- (Inclusive of GST) (Rupees Two Crore Ten Lakh Only).
Completion period	12 Months (from the date of notification of award of Contract/Purchase Order).
Earnest Deposit Money(EMD)	Rs. 2,10,000/- (Rupees Two Lakh Ten Thousand Only).
Mode of Tender	eProcurement at NCDFI eMarket portal, considering online open tender of IDMC with single stage two bid envelope system (Part I- Techno-commercial Bid and Part II- Price Bid) through www.idmc.com (click procurement) OR https://www.ncdfiemarket.com/index.php/idmc/ and can be downloaded and used as tender document for uploading the offer. The intending bidders are required to submit their offer electronically through NCDFI eMarket portal. No physical tender/email is acceptable.

Issued by Head (Purchase),
tender committee, IDMC LTD, Anand.

IDMC LTD	Invitation for Bid	BIDDER
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Section 0

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IDMC LTD

Invitation for Bid

BIDDER

INVITATION FOR BID

**Tender/Event Ref. No: IDMC/ Sourcing & VD/ 2025-26/ Enquiry/ 290
Dated 21.08.2025**

1.0 DESCRIPTION OF WORKS: The IDMC Limited, having its Head Office at Anand, Gujarat invites item rate bids from eligible bidders, for the construction & completion of the following works:

EFFLUENT TREATMENT PLANT, EXPANSION & MODIFICATION OF EXISTING CAPACITY FROM 150 KLD TO NEW 200 KLD FOR DAIRY PLANT AT PURABI DAIRY, GUWAHATI, ASSAM

ADDITIONAL INFORMATION: Interested eligible bidders may obtain further information from and download the bidding documents from NCDFI portal www.idmc.com(click procurement) OR <https://www.ncdfiemarket.com/index.php/idmc/>

2.0 REQUEST FOR BIDDING DOCUMENT:

- (a) The bid documents will be available in the website www.idmc.com (click procurement) OR <https://www.ncdfiemarket.com/index.php/idmc/> can be downloaded and used as tender documents for uploading the offer.
- (b) It is hereby brought to the notice of all bidders that if any change/additions/ deletions/alterations are found to be made by them in the tender and the same is subsequently noticed at any stage, even after award of the contract, the bidders are liable for all consequences thereof and IDMC LTD shall be free to take suitable action as deemed necessary.

3.0 Minimum Eligibility Criteria: For the purpose of bidding, the bidder shall meet the following minimum qualifying criteria:

- a) The Bidder, in the same name and style, should be in business at least for **five years** at time of bid opening. In case of change of

IDMC LTD

Invitation for Bid

BIDDER

name of bidder by merger / acquisition / change in status, the bidder may be eligible based on the documentary evidence.

- b) The Bidder should have valid registration under various Acts that may be applicable for the contract proposed. This shall include but not limited to Income Tax, Companies Act, GST, the Building & other construction workers' welfare cess act, Employee State Insurance, Contract Labour, Provident fund etc.
- c) The Bidder's financial turnover in the same name and style during each of the **last three financial years (22-23; 23-24; 24-25)** ending 31st March should **not be less than 80% of the estimated contract value.**
- d) The bidder should have positive net worth in **last two financial years.**
- e) The bidder should have **cash profit** in any two financial years out of the last five financial years
- f) The Bidder in the same name & style shall have successfully executed /completed contracts of **Similar nature of work**** during the last five years ending last day of the month previous to the month in which bid is opened, either of the following: -
 - I. **One contract/work of similar nature costing not less than 80% of estimated value of the contract.**
 - OR**
 - II. **Two contracts/works of similar nature each costing not less than 50% of the estimated value of the contract.**

Notes:

- a) **** Similar nature of work means Effluent Treatment Plant works of industrial buildings in Dairy/ Food or Beverage/Pharma/ Chemical/ Electronics/Frozen Semen station.**

IDMC LTD

Invitation for Bid

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including or excluding internal electrification works etc.

- b) The contract means the work done against one work order on a single location.
- c) Cost of contracts/works shall be considered for evaluation as per the clause 4(f) above excluding the cost/recovery of materials supplied by the purchaser.

Bidder shall submit the following details to support their claim for meeting the minimum eligibility requirement -

1. Name / Names of project to be considered for meeting minimum eligibility criteria
 2. Nature of each project / work completed.
 3. Value of work of each project / work completed.
 4. Location of execution of each project/work completed.
- The copy of purchase order/work order, completion certificate and abstract sheet of final bill/invoice showing the cumulative value of work done should be submitted in order to support aforesaid details. In case, the final bill/invoice does not contain cumulative value of work done, copy of all the bills/invoices submitted prior to the final bill should be attached.

Note:

For evaluation and comparison of bids, the purchaser may, at its discretion, ask the bidder for clarification on the bid. The shortfall information / documents shall be sought only in case of historical documents which pre-exist at the time of tender opening and which have not under gone change since then.

So far as the submission of the documents is connected with regard to qualification criteria, after submission of the tender, only related shortfall documents shall be asked for the considered. For example, if the bidder has submitted a supply order without its completion / performance certificate, the certificate can be asked for and considered. However, no new supply order shall be asked for and considered so as to qualify the bidder.

- g) In addition to the above, the following information/documents should also be submitted along with the bid by the bidders for evaluation/determination of their eligibility:
- I. Copy of Income Tax Returns and audited balance sheet for **three** previous years in original or certified true copies, along with Permanent Account Number (PAN) for income tax purpose.

II. Copy of TDS certificate issued by the clients to substantiate the claim for the value of works executed in the private sector.

III. Copy of Form 26 AS for the last 3 financial Years

- h) Even though the bidder meets the specified criteria, it may be disqualified if it has:
- I. Made untrue or false declaration in the forms, statements and attachments submitted in proof of their qualification and / or
- II. Record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion or financial failure etc.


As a part of **Technical Bid** (part-I) the bidder shall also submit the following documents & credentials.

1. The manpower deployment plan of bidder and the organization chart. The bidder to deploy at project site minimum 1 nos. Graduate Project Engineer (Mechanical), 1 no. QC Engineer, 1 no. Safety (EHS) Engineer and 1 Electrical Engineer with varying experience ranging from 5 to 15 years.

2. QAP plan with method statement & schedule in MS Project

5.0 BID DETAILS: Detailed terms and conditions as well as the technical specifications for all the items of works as indicated in the invitation for bid are contained in one bidding document.

(a)	Tender/Event Ref. No.:	IDMC/ Sourcing & VD/ 2025-26/ Enquiry/ 290 Dated 21.08.2025
(b)	Transaction Fee Payment of transaction fee by NEFT/ RTGS in favour of IDMC Limited (refer clause No.-4 of Annexure-A)	: Not Applicable
(c)	Incidental charges (in land) in case documents are to be sent by courier/post	: Not Applicable
(d)	Event Start Date	25.08.2025
(e)	Event Close Date & time	15.09.2025, 17.00 Hours
(f)	Last Date and time for bid	15.09.2025, 17.00 Hours
IDMC LTD Invitation for Bid BIDDER		

		Section 0	Page - 0 - 8
	Submission		
(g)	Place of opening of bids	ONLINE on web portal	
(h)	Address for communication	: Head (Purchase), IDMC Ltd, V.U Nagar, Anand 124-128 GIDC Estate Vithal Udyognagar- 388121 Dist.- Anand (Gujarat) Tel: 02692-220521 Email: tenders@idmc.com	
(i)	Estimated Cost of works	Rs. 2,10,00,000/- (Inclusive of GST) (Rupees Two Crore Ten Lakh Only).	
(j)	Time of completion	12 Months (from the date of notification of award of Contract/ Purchase Order).	
(k)	Amount of Bid Security	Rs. 2,10,000/- (Rupees Two Lakh Ten Thousand Only).	
(l)	Date and time for receipt of EMD. The EMD in original to be submitted to communication	13.09.2025 17.00 Hours	
IDMC LTD		Invitation for Bid	BIDDER

address as stated above in clause (i)

6.0 PURCHASE OF BIDDING DOCUMENT IN PERSON: Not Applicable. Only Downloading.

7.0 PURCHASE OF BIDDING DOCUMENT BY COURIER/POST: Not Applicable. Only Downloading.

8.0 EARNEST MONEY DEPOSIT (EMD): All bids must be accompanied by a Earnest Money Deposit (EMD) in the acceptable form as specified in the bidding document and must be delivered to the address of communication as stated above in **clause 5.0 (i)** on or before the last date and time of receipt of bids as given in **clause 5.0 (m)** above.

9.0 PRE-BID MEETING: (Not applicable for this work)

10.0 OPENING OF BIDS: All the bidders should submit their online bids in Part I – Technical Bid and Part II – Price Bid. The technical bid (Part I) shall contain all the details EXCEPT FOR THE PRICE. Only technical bids (of those bidders whose Original EMD, in acceptable form, have reached the office of IDMC LTD as mentioned above in clause no. 5-Bid Details (m) of this Section) shall be opened online on the date and time specified above. The date and time of opening of Price Bid (Part II) shall be communicated later to responsive /technically qualified bidders.

11.0 BID VALIDITY: The Bid shall remain valid for a period of **120 (One Hundred Twenty) days** from the date of bid opening as mentioned above.

12.0 BID SECURITY VALIDITY: The bid security accompanying the bid shall be valid till **15.01.2026**.

13.0 TENDER DRAWINGS: Drawing(s) are attached with this bidding document and the same shall be available for reference at the office of

IDMC LTD

Invitation for Bid

BIDDER

The IDMC Ltd, at the address of communication on all working days.

14.0 RIGHTS RESERVED BY IDMC LTD: IDMC Ltd, at its sole discretion & without assigning any reason thereof reserves the right to accept and / or reject any or all the bids.

Issued by Head (Purchase),
tender committee, IDMC LTD, Anand.

IDMC LTD

Invitation for Bid

BIDDER

SECTION - I , INSTRUCTIONS TO BIDDERS / VENDORS

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3.	Eligibility and Qualification Requirements	I-4
4.	Cost of Bidding	I-8
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B	BIDDING DOCUMENTS	I-4
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IDMC Ltd.	Instructions to Bidders	BIDDER

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IDMC Ltd. Instructions to Bidders BIDDER		

SECTION - I - INSTRUCTIONS TO BIDDERS**A. GENERAL****1.0 General Information:**

1.1(a) Description : EFFLUENT TREATMENT PLANT, EXPANSION & MODIFICATION OF EXISTING CAPACITY FROM 150 KLD TO NEW 200 KLD FOR DAIRY PLANT AT PURABI DAIRY, GUWAHATI, ASSAM

(b) Owner : WESTERN AMUL MILK UNION LIMITED

1.2 Location and Area:

(a) Project site : EFFLUENT TREATMENT PLANT, EXPANSION & MODIFICATION OF EXISTING CAPACITY FROM 150 KLD TO NEW 200 KLD FOR DAIRY PLANT AT PURABI DAIRY, GUWAHATI, ASSAM

(b) Nearest Railway Station : Guwahati

(c) Nearest Airport : Guwahati Airport.

(d) Nearest Major Town : Guwahati.

(e) Nearest Road : NH-27 Porbandar to Sicer

1.3 Period of Completion:

The Period of completion shall be **12 Months for overall completion** from the date of issuance of work order (WO / LOI), **which shall include the non-working periods during monsoon and festivals.**

2.0 Source of Funds:

The Service Recipient has arranged the funds and provided to the purchaser.

3.0 Eligibility and Qualification Requirements:

- 3.1** This invitation for bid is open to all bidders from all eligible sources.
- 3.2** All goods and services to be supplied under this Contract shall have their origin in eligible source and all expenditures made under the Contract will be limited to such goods and services.
- 3.3** For the purpose of this clause, "Origin" means the place where the goods are mined, grown or produced or from which the services are supplied. Goods are produced when, through manufacturing or processing or substantial and major assembling of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose of utility from its components.
- 3.4** The origin of goods and services is distinct from the nationality of the bidder.
- 3.5** To be eligible for the award of Contract, bidders shall provide evidence satisfactory to the IDMC Ltd, of their eligibility under **sub-clause 3.1** above, and adequacy of resources to carry out the Contract effectively. To this end, all bids submitted shall include the following information:
- (A) Copies of original documents or certified true copies, defining the constitution or legal status, place of registration and principal place of business of the company or firm or partnership.
 - (B) Power of Attorney or a true copy thereof duly attested in case an authorized representative has signed the bid.
 - (C) ~~Sales tax/VAT (as applicable) clearance certificate for current financial year, copy duly attested.~~ **Deleted**
 - (D) Details of the experience and past performance of the bidder on works of similar nature **within the past five years**, and details of current work in hand and other Contractual commitments shall be submitted as per formats given in **Schedule IV and Schedule VIII of Section VII respectively of this bidding document.**
 - (E) Major items of constructional plant proposed for use in carrying out the Contract in the format prescribed in **Schedule I** and the qualifications and experience of key personnel proposed for the administration and the

execution of the Contract, both on and off site, in the format prescribed in **Schedule II of Section VII of this bidding document.**

(F) Proposals for sub-contracting elements of the works amounting to more than **10%** of the bid price for each element and shall be as listed in **Schedule III of Section VII of this bidding document.**

(G) Reports on the financial standing of the bidder such as profit and loss statements, balance sheets and auditor reports for **the past three years**, an estimate of the financial projection for the **next two years** as prescribed in the **Schedule VII of Section VII of this bidding documents**, and an authority from the bidder to seek reference from the bidder's bankers; and

(H) Statement of arbitration/disputes in which the bidder is involved as prescribed in the **Schedule VI of Section VII of this bidding document.**

Note: As a part of **Technical Bid** (part-1) the bidder shall also submit the following documents & credentials.

1. The manpower deployment plan of bidder and the organization chart. The bidder to deploy at project site minimum 1 nos. Graduate Project Engineer, 1 no. QC Engineer, 1 no. Safety (EHS) Engineer and 1 Electrical Engineer with varying experience ranging from 5 to 15 years.

2. Technical capability of the firm includes the equipment owned by them. They should deploy one no. fully automated concrete batching plant with printing facility and accessories, Poclain, Excavator with Hydraulic Chiller Breaker arrangement & Backhoe good quality new shuttering materials as per project requirements and fully furnished QC laboratory for regular testing of materials at project sites as per QAP.

3. QAP plan with method statement & schedule in MS Project.

3.6 For the purposes of this particular Contract bidders shall meet the following qualifying criteria as minimum:

a) The Bidder, in the same name and style, should be in business for at least **five years** at the time of the bid opening. In case of change of name of bidder by merger / acquisition / change in status, the bidder may be eligible based on the documentary evidence.

b) The Bidder should have valid registration under various Acts that may be

applicable for the contract proposed. This shall include but not limited to Income Tax, Companies Act, GST, the building & other construction workers' welfare cess act, Employee State Insurance, Contract Labour, Provident fund etc.

- c) The Bidder's financial turnover in the same name and style during each of the **last three financial years (22-23; 23-24; 24-25)** ending 31st March should **not be less than 60% of the estimated contract value**.
- d) The bidder should have positive net worth in the last two financial years.
- e) The bidder should have a cash profit in any two financial years out of the last five financial years
- f) The Bidder in the same name & style shall have successfully executed /completed contracts of similar nature. **Similar nature of work means Effluent Treatment Plant works of industrial buildings in Dairy/ Food or Beverage/Pharma/ Chemical/ Electronics/Frozen Semen station.** ending last day of the month previous to the month in which bid is opened, either of the following: -

- I.** One contract/work of similar nature costing not less than 80% of the estimated value of the contract.

OR

- II.** Two contracts/works of similar nature each costing not less than 60% of estimated value of the contract.

Notes:

- a) The contract means the work done against one workorder on a single location.
- b) Cost of contracts/works shall be considered for evaluation as per the clause 3.6 (f) above excluding the cost/recovery of materials supplied by the purchaser.

Bidder shall submit the following detail to support their claim for meeting the minimum eligibility requirement -

1. Name / Names of project to be considered for meeting minimum eligibility criteria
2. Nature of each project / work completed.
3. Value of work of each project / work completed.
4. Location of execution of each project/work completed. The copy of purchase order/work order, completion certificate and abstract sheet of final bill/invoice showing the cumulative value of work done should be submitted in order to support aforesaid details. In case, the final bill/invoice, does not

contain cumulative value of work done, copy of all the bills/invoices submitted prior to the final bill should be attached.

g) In addition to the above, the following information/documents should also be submitted along with the bid by the bidders for evaluation/determination of their eligibility:

I. Copy of Income Tax Returns and audited balance sheet for **three** previous years in original or certified true copies, along with Permanent Account Number (PAN) for income tax purpose.

II. Copy of TDS certificate issued by the clients to substantiate the claim for the value of works executed in the private sector.

III. Copy of Form 26 AS for the last 3 financial Years

h) Even though the bidder meets the specified criteria, it may be disqualified if it has:

I. Made untrue or false declaration in the forms, statements and attachments submitted in proof of their qualification and / or

II. Record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion or financial failure etc.

III. If the bidder is overbooked beyond his capacity to execute the work as per required schedules, the bidding capacity of the bidder will be worked out by following methodology. The available bid capacity of the bidder shall be worked out on the basis of ready for erection time and cost (i.e. 60% of the estimated cost indicated in IFB).

Assessed Available bid capacity = $(A \times N \times 1.5 - B)$

Where,

A= Maximum turnover achieved in any one year during the last three years.

N= Number of years (number of months/12) prescribed for ready for erection of the works for which bids are invited as specified in Invitation for Bid.

B= Value of on-going works to be completed during the period of ready for erection of the works for which bids are invited.

4.0 Cost of Bidding:

The bidder shall bear all costs associated with the preparation and submission of his bid and the IDMC Ltd, hereinafter referred to as IDMC LTD will in no case be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

5.0 Project Site Visit:

- 5.1** The bidder is advised to visit and examine the site of works and its surroundings and obtain for himself on his own responsibility all information that may be necessary for preparing the bid and entering into a Contract. The costs of visiting the site shall be at bidder's own expenses.
- 5.2** The bidder and any of his personnel or agent(s) will be granted permission by the IDMC LTD to enter upon the premises and lands for the purpose of such inspection but only upon the express condition that the bidder, his personnel and agent(s) from and against all liabilities in respect thereof and will be responsible for personal injury (whether fatal or otherwise), loss of or damage to property and any other loss or damage, costs and expenses however caused, which but for the exercise of such permission would not have arisen.
- 5.3** Each of the civil contracts, if executed at site under the circumstances of an operating plant which cannot be closed down for any reason, the site works of every nature has to be planned and executed with the knowledge of operational and processing routines at existing plant, as the plant will continue uninterrupted throughout the year. The execution of contract will be done with clear understanding that their all staff and workers will have to strictly abide by the security rules and procedures that is followed by plant authorities during the concurrency of the contract.

B. BIDDING DOCUMENTS
6.0 Contents of Bidding Documents:

- 6.1** The set of Bidding documents issued for the purpose of bidding includes the number of copies as stated below, together with any addenda there to issued in accordance with **clause-8** & any minutes of the pre-bid meeting issued in accordance with **clause-16**.

Number copies	Volume	Section	Description of
1	I	0	Invitation for Bid
1	I	I	Instructions to bidders
1	I	II	General Conditions of Contract
1	I	III	Special Conditions of Contract

1	I	IV	Technical Specifications
1	I	V	Form of Bid
1	I	VI	Schedule of Materials to be issued by owner/IDMC LTD
1	I	VII	Schedule of Supplementary Information
1	I	VIII	Form of Agreement
1	I	IX	Acceptable Forms of Bank Guarantees
1	II	X	Schedule of Quantities
1	II	XI	Sketches – General Site Layout

6.2 The Bidder is expected to examine carefully all instructions, conditions, forms, terms, specifications and drawings in the bidding documents. Failure to comply with the requirements of bid submission will be at the bidder's own risk. Pursuant to **clause-25**, bids which are not substantially responsive to the requirements of the bidding documents will be rejected.

7.0 Clarification of Bidding Documents:

A prospective bidder requiring any clarification of the bidding documents may notify the IDMC LTD in writing at the address of communication indicated in the Invitation for bid. The IDMC LTD will respond in writing to any request for the clarification which is required earlier than **10 days** prior to the deadline for the submission of the bids. Written copies of the response of the IDMC LTD (including a description of the enquiry without identifying its source) will be sent to all prospective bidders who purchased the bidding documents.

8.0 Amendment of Bidding Documents:

8.1 At any time prior to the deadline for the submission of bids, the IDMC LTD may for any reason whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the bidding document by the issuance of amendment.

8.2 The amendment will be sent in writing to all prospective bidders who have purchased the bidding documents and will be binding upon them. The amendment will also be notified separately as Corrigendum for the respective bidding document on the IDMC LTD's website. Prospective bidders shall promptly acknowledge receipt thereof in writing to the IDMC LTD. However, the late receipt of the amendments by the prospective bidder due to postal delays shall not bind the IDMC LTD to extend the deadline for the

submission of the bids. The amendment will be attached to the bidding document sold subsequently.

- 8.3** In order to afford prospective bidders reasonable time in which to take an amendment into account in preparing their bids, the IDMC LTD may, at its discretion, extend the deadline for the submission of bids in accordance with **clause-19**.

C. PREPARATION OF BIDS

9.0 Language of Bid:

The bid prepared by the bidder and all correspondence & documents relating to the bid exchanged by the bidder and the IDMC LTD shall be written in the **English language**. Supporting documents and the printed literature furnished by the bidder with the bid may be in another language provided if required an English translation of the same is provided. For the purpose of the interpretation of the bid, the **English language** shall prevail.

10.0 Documents Comprising the Bid:

The bid to be prepared by the bidder shall comprise the following:

- (a) The form of bid along with Appendixes (**Refer Section V**) thereto duly filled;
- (b) The bid Security;
- (c) The Schedule of Quantities duly filled on portal
- (d) The Schedule of supplementary information (**Refer Section VII**), the information on eligibility and qualifications;
- (e) The complete bidding document has to be returned along with bid as stated above.
- (e) Alternative offers where invited, and any other materials required to be completed and submitted in accordance with the Instruction to Bidders (**Section I**) embodied in these bidding documents.

The forms, Schedule of quantities and Schedule provided in this bidding document shall be used without exception (subject to the extension of the Schedules in the same format and to the provisions of **sub-clause 14.2** regarding the alternative form of Bid Security)

Additional special instructions:

Before uploading their bid, the bidder should check the IDMC LTD's /IDMC's website for any Corrigendum/additional information on the bidding document,

if any. However, non- information in changes/amendments put on website as Corrigendum to the prospective bidders shall not bind the IDMC LTD to extend the deadline for the submission of the bids and non-compliance to such Corrigendum by the bidder shall result to non-responsiveness of the bid leading to rejection.

11.0 Bid Prices:

11.1 Unless stated otherwise in the bidding documents, the Contract shall be for the whole works as described in the Invitation for bid based on the schedule of unit rates and prices submitted by the bidder.

11.2 The bidder shall fill in rates and prices for all items of works described in the schedule of quantities. **Items against which no rate is entered by the bidder shall not be paid for by the IDMC LTD when executed and shall be deemed to have covered by the other rates in the schedule of quantities.**

11.3 All applicable Taxes (GST), levies, cess (including labour cess, seigniorage, royalty etc., as applicable to this contract) and duties shall be payable by the bidder under the Contract or for any other cause, and shall be included in the rates and the prices and total bid price submitted by the bidder and the evaluation and the comparisons of bids by the IDMC LTD shall be made accordingly.

11.4 Fixed Prices:

The rates and prices quoted by the bidder shall be fixed for the entire duration of the Contract and shall not be subjected to adjustment on any account except as defined in clause no. 11.5 below. A bid submitted with any price adjustment condition except as defined in clause no. 11.5 below shall be treated as non-responsive & rejected, pursuant to **clause 25 of this section**. Any variation in the taxation shall be subjected to the adjustment as per the detailed specified under clause 72 of section II of the bidding document.

11.5 Price Variation – Not Applicable for this contract:**12.0 Currency of Bid & Payment:**

The unit rates and prices shall be quoted by the bidder entirely in Indian currency and all payment shall be made in Indian currency only.

13.0 Bid Validity:

13.1 Bids submitted shall remain valid for acceptance for a period of **120 days** from the date of bid opening.

13.2 In exceptional circumstances, prior to expiry of the original bid validity period, the IDMC LTD may request the bidder for a specified extension in the period of validity. The request and the response thereto shall be made in writing. A bidder may refuse the request without forfeiting his bid security. A bidder agreeing to the request shall not be permitted to modify his bid, but shall be required to extend the validity of his bid security correspondingly. The provisions of **clause 14** shall continue to apply during the extended period of bid validity.

14.0 Bid Security:

14.1 The bidder shall furnish, as part of the bid, a bid security for each package separately of the amount as specified in **clause 5 (I)** in the **Invitation for bid, Section 0**.

14.2 The Earnest Money Deposit (EMD) shall be denominated in Indian Rupees only, and shall be in one of the following forms.

a) **A Bank Guarantee issued by a Nationalized Indian Bank or a Foreign Bank having Branches in India, in the form Provided in Bidding Document and valid till 15/01/2026.**

Or

b) **A Demand Draft/ Bankers Cheque issued by a Nationalized Bank/Schedule Bank / Foreign Bank having branches in India, drawn in favour of IDMC Limited, payable at Anand.**

Or

c) **Through Online Banking Transaction i.e. NEFT/RTGS**

Bidders can pay/remit the EMD through NEFT/RTGS to IDMC LTD Account (details mentioned below) and upload the transaction details of e-procure Portal along with techno-commercial bid. Bidder must inform the transaction details through email (tenders@idmc.com) as per enclosed format **on or before 12:00 hrs. on the last date of receipt of bid.**

Details of IDMC LTD's Bank Account for online banking transaction i.e. NEFT/RTGS is as under:

1. Beneficiary Name	IDMC Limited
2. Beneficiary Bank & Branch	INDIAN BANK ANAND BRANCH

3. Account Number to be credited	CA -494481837
4. RTGS/IFSC Code	IDIB000A021 (PLEASE READ 'ZERO' AFTER B)

Format for e-mail confirmation about the transaction made thru NEFT/RTGS for EMD:

Name of the Bidder	IFB Reference	EMD Amount	Bank Details UTR No. & date

Bidders shall be required to submit/upload the successful transaction details along with techno-commercial bid.

The bid shall not be considered if the valid EMD is not available at the time of opening of techno-commercial Bid.

14.3 Any bid not accompanied by an acceptable Earnest Money Deposit (EMD) pursuant to **clause 14.1 and 14.2** hereof shall be rejected by IDMC LTD as non-responsive.

14.4 The Earnest Money Deposit (EMD) of the unsuccessful bidders shall be refunded as promptly as possible, but not later than **30 days** after the expiry of the period of bid validity as prescribed in these documents.

14.5 Earnest Money Deposit (EMD) of the successful bidder(s) shall be refunded when the bidder has signed the Agreement and furnished the required performance security.

14.6 No interest shall be paid by the IDMC LTD on the Earnest Money Deposit (EMD) furnished by the bidder.

14.7 The Earnest Money Deposit (EMD) may be forfeited
 (a) If a bidder withdraws his bid during the period of bid validity; or
 (b) In the case of a successful bidder, if he fails within the time limit to:
 (i) Sign the agreement, or
 (ii) Furnish the required performance security.

15.0 Variation in Bidding Conditions:

15.1 The bidder shall submit offer which comply fully with the requirements of the bidding documents, including the basic technical design as indicated in the

drawings and specifications. Conditional bids are liable to be considered as non-responsive in accordance with **clause-25**.

16.0 Pre-Bid Meeting: (Not Applicable for this tender).

17.0 Format and Signing of Bids:

17.1 The bidder shall prepare and upload the original copy of the documents comprising the bidding documents downloaded by him.

17.2 All pages of the bidding documents shall be digitally signed by person(s) duly authorised, to bind the bidder to the Contract. Proof of authorisation shall be in the form of a written power of attorney which shall accompany the bid. All pages of the bid documents, where entries and amendments had been made, shall additionally be initialled by the person(s) signing the bids.

17.3 The complete bid shall be without alterations, interlineations or erasures except those in accordance with instructions issued by the IDMC LTD, or as necessary to correct errors made by the bidder in which case such corrections shall be initialled by the ~~person(s) signing the bid. No over writing shall be permitted.~~

17.4 Only one bid may be uploaded by each bidder. No bidder shall be allowed to participate in the bid in the name of another for the same Contract in any relation whatsoever.

17.5 The bidder shall quote the rate of each item both in figures and words.

D. SUBMISSION OF BIDS

18.0 The Technical Bid (Part I) and The Commercial Bid (Part II) has to be uploaded on-line at NCDFI eMarket portal.

19.0 Deadline for Submission of Bids:

19.1 Bids must be uploaded on or before the date and time of submission as stated in the bid.

19.2 The IDMC LTD may, at its discretion, extend the deadline for the submission of bids by issuing an amendment in accordance with **clause 8** hereof, in which case all rights and obligations of IDMC LTD and the bidders previously subject to the original deadline shall thereafter be subject to the new deadline as extended.

20.0 Late Bids: Not Applicable**21.0 Modification and Withdrawal of Bids**

21.1 The bidder cannot modify or withdraw his bid after bid submission.

21.2 Withdrawal of the bid during the interval between the deadline for the submission of bids & the expiry of the period of bid validity shall result in the forfeiture of the Earnest Money Deposit (EMD) pursuant to **clause 14**.

E. BID OPENING AND EVALUATION**22.0 Bid Opening**

The IDMC LTD will open the Technical bids on the time and date stated in the IFB. Bidders can witness electronic opening of bid.

Commercial bids will be opened electronically of only those bidders whose Technical Bid is found to be acceptable by IDMC LTD. Such bidders will be intimated date of opening of Part II- Commercial Bid separately.

The IDMC LTD will examine the bids to determine whether they are complete, whether the requisite Earnest Money Deposit (EMD) have been furnished, whether the documents have been properly signed, and whether the bids are generally in order.

23.0 Process to be Confidential:

23.1 After the public opening of bids, information relating to the examination clarification, evaluation and comparison of bids and recommendations concerning the award of Contract shall not be disclosed to bidders or other persons not officially concerned with such process until the award of the Contract to the successful bidder has been announced.

23.2 Any effort by a bidder to influence the IDMC LTD in the process of examination, clarification, evaluation and comparison of bids and in the decision concerning the award of Contract may result in the rejection of the bidder's bid.

24.0 Clarification of Bids:

24.1 To assist in the examination, evaluation and comparison of bids, the IDMC LTD may ask the bidders individually for clarification of their bids, including break down of unit rates. The request for clarification and the response shall be in writing but no change 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 IDMC LTD during the evaluation of the bids in accordance with **clause 26**.

25.0 Determination of Responsiveness

25.1 Prior to the detailed evaluation of the bids the IDMC LTD will determine whether each bid is substantially responsive to the requirements of the bidding documents.

25.2 For the purpose of this clause, a substantially responsive bid is one which conforms to all terms, conditions and specifications of the bidding documents without material deviation or reservation. A material deviation or reservation is one which affects in any substantial way the scope, quality or the performance of the works or which limits in any substantial way, inconsistent with the bidding documents, the IDMC LTD's right or the bidder's obligations under the Contract, and the rectification of which deviation or reservation would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

25.3 If a bid is not substantially responsive to the requirements of the bidding documents, it will be rejected by IDMC LTD and may not be subsequently made responsive by the bidder having corrected or withdrawn the non-conforming deviation or reservation.

26.0 Correction of Errors: Not Applicable**27.0 Conversion to Single Currency:**

27.1 All bid prices shall be submitted in Indian currency only.

28.0 Evaluation and comparison of the Bids:

28.1 The IDMC LTD evaluate and compare only bids determined to be substantially responsive to the requirements of the bidding documents in accordance with **clause 25**.

28.2 In evaluating bids, the IDMC LTD will determine for each bid the evaluated price by adjusting the bid price making any correction for errors pursuant to **clause 26.0**

28.3 The IDMC LTD reserves the right to accept or reject any variation, deviation or alternative offers. Variations, deviations and alternative offers and other factors which are in excess of the requirement of the bidding documents or

otherwise result in the accrual of unsolicited benefits to the IDMC LTD shall not be taken in to account in bid evaluation.

28.4 Price variation provisions of the Contract shall be taken in to account in bid evaluation pursuant to **clause 11.5**

28.5 Additional Performance Security:

- If the bid of the successful bidder is having ALR (Abnormally Low Rates i.e. the rates less than 40% of estimated rates) for prices of individual items or total bid price offered in relation to the IDMC LTD's item rates estimate or total price estimate of the real cost of the work to be performed under the Contract, the IDMC LTD may require that the amount of the performance security deposit set forth in the **clause 33.0** be increased at the expense of the successful bidder to a level sufficient to protect the IDMC LTD against financial loss in the event of subsequent performance of the successful bidder under the Contract.

28.6 Upon the furnishing by the successful bidder of a performance security in accordance with the **clause 33** the IDMC LTD may notify the unsuccessful bidders that their bids have been unsuccessful.

29.0 Award Criteria

The Purchaser will award the contract to the successful bidder whose bid has been determined to be substantially responsive and has been determined as the lowest evaluated bid provided further the bidder is determined to be qualified to perform the contract satisfactorily as per clause 28.

Subject to Para 29.1, the Purchaser will award one single contract or more than one contract to the successful bidder at the Purchaser's discretion.

30.0 IDMC LTD's Right to accept any bid and to reject any or all bids.

The IDMC Limited reserves the right to accept or reject any offer /bid and to annul the bidding process and reject all offers/ bids, at any time prior to the award of the Contract, without thereby incurring any liability to the affected bidder(s) or any obligation to inform the affected bidder(s) of the grounds for the IDMC Limited's action.

31.0 Notification of Award

31.1 Prior to the expiry of the period of offer /bid validity prescribed in the enquiry / bid documents, the IDMC Limited will notify the finalized bidder / vendor here in after referred to as the "Agency / Contractor", in writing on acceptance of their offer /bid and issue a Letter of Intent / Award, followed by Detailed Purchase order mentioning all the required terms and conditions and

(hereinafter and in the Conditions of the Contract referred to as the "Contract price")

- 31.2** Upon the furnishing by the successful bidder of a performance security in accordance with the **clause 33** the IDMC LTD may notify the unsuccessful bidders that their bids have been unsuccessful.

32.0 Signing of Agreement:

- 32.1** At the same time that the IDMC LTD notifies the successful bidder that his bid has been accepted, the IDMC LTD will send the bidder the Form of Agreement provided in the bidding documents (**Section VIII**), incorporating all agreements between the parties.

- 32.2** Within **15 days** of the receipt of the Form of Agreement the successful bidder shall sign the Form and return it to IDMC LTD.

33.0 Performance Security:

- 33.1** Within **30 days** of the receipt of the notification of award from the IDMC LTD, the successful bidder shall furnish to the IDMC LTD a performance security for an amount of **5% (five percent)** of the Contract cost pursuant to clause **10.0 of General Conditions of Contract (Section II)**.

Failure of the successful bidder to comply with the requirements of the **clauses 32 or 33** shall constitute sufficient grounds for the annulment of the award and forfeiture of the Earnest Money Deposit (EMD).

34.0 License and Permit for Goods/Services:

Unless stated otherwise, no license or permit shall be provided by Purchaser/Owner/Service Recipient for the Goods/Services being provided by contractor against this bid.

SECTION – II

GENERAL CONDITIONS OF CONTRACT

SECTION II GENERAL CONDITIONS OF CONTRACT
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GENERAL CONDITIONS OF CONTRACT**DEFINITIONS AND INTERPRETATIONS**

- 1.0 DEFINATION AND INTERPRETATION:** In the Contract, as hereinafter defined, the following words and expressions shall have the meanings hereby assigned to them, except where the context otherwise requires:-
- 1.1 OWNER/PROJECT AUTHORITY/ SERVICE RECIPIENT** - shall mean the client on whose behalf the enquiry is issued by the IDMC Limited and shall include its successors and assignees, as well as its authorised representatives.
- 1.2 PURE AGENT/ CONSULTANT** shall mean the IDMC Limited or the consultants appointed by the IDMC Limited or the Owner for the Project.
- 1.3 IDMC LTD** shall mean the IDMC LIMITED
- 1.4 ENGINEER** shall mean the Engineer or any other authorized representative of the IDMC LTD.
- 1.5 Architect** shall mean the architect appointed by the IDMC LTD/Owner.
- 1.6 Structural Consultants** shall mean the Structural Consultants appointed by the IDMC LTD/Owner.
- 1.7 Bidder** shall be the firm/party/individual who submits the bid against the Invitation for Bid.
- 1.8 Contractor** shall mean the successful bidder whose Bid has been accepted by the Owner / IDMC LTD and on whom a work order has been placed and shall include his heirs, legal representatives and assignees.
- 1.9 Sub-Contractor** shall mean the person/firm/ party named by the Contractor whom a part of the Contract has been sublet with the consent of owner /IDMC LTD and shall include his heirs, successors, legal representatives, and assignees.
- 1.10 Contract price/rate** shall mean the prices/rates of the accepted Bid.
- 1.11 Contract** shall mean the work order along-with articles of agreement, the conditions, the appendix, the schedule of quantities, and/or specifications attached herewith.
- 1.12 "Notice in writing"** shall mean a notice in written, typed or printed characters sent (unless delivered personally or otherwise proved to

have been received) by courier/registered/ordinary post to the last known address or the registered office of the addressee and shall be deemed to have been received when in the ordinary course of post it would have been delivered.

- 1.13 “Engineer -In-charge”** means the site engineer designated as such or other Engineer appointed from time to time by purchaser.
- 1.14 Site** shall mean the actual place of the proposed project or any other place where work is to be executed under the Contract. It shall also include any other land allotted by the IDMC LTD for the Contractor's use.
- 1.15 Month** shall mean from the beginning of a given date of a calendar month to the end of the preceding date of the next calendar month.
- 1.16 Week** shall mean seven consecutive days.
- 1.17 Day** shall mean a day from midnight to midnight.
- 1.18 Building** shall mean the proposed building (s), roads, fencing, sanitary and water supply, underground/overhead water tank etc. under the Contract.
- 1.19 Bid Security** shall mean the sum paid along with the bid as a token to bind the Contract.
- 1.20 Award** shall mean the written acceptance of Bid by the IDMC LTD/owner given to the successful bidder.
- 1.21 Performance Security** shall mean the amount pledged with the IDMC LTD while signing the agreement for faithful and satisfactory performance of the Contract.
- 1.22 Constructional Plant** shall mean all appliances or things of whatsoever nature required in or about the execution and maintenance of the Works but does not include the materials or other things required /intended to form or forming part of the Works.
- 1.23 Specifications** shall mean the specification referred to in the bid and any modification thereof or addition thereto as may from time to time be furnished or approved in writing by the IDMC LTD/Engineer.
- 1.24 Drawings** shall mean drawings referred to in the specifications and any modification of such drawings approved in writing by the Engineer and such other drawings as may from time to time be furnished or approved in writing by the IDMC LTD/Engineer / consultant.

1.25 Temporary Works shall mean temporary works of every kind required in or about the execution or maintenance of works.

1.26 Permanent Works shall mean the permanent works to be executed and maintained in accordance with the Contract.

1.27 Works shall include both temporary works and permanent works.

1.28 Approved/Approval shall mean approval in writing, including subsequent written confirmation of previous verbal or written approval.

1.29 I.S.S. shall mean Indian Standard Specifications

1.30 Government shall mean the Government of India or any other State Government.

1.31 Tender shall mean the Bid.

1.32 Headings and Marginal notes:

All headings of and notes to the clauses of these Conditions of Contract or of and to the Specifications or any other bid document are solely for the purpose of giving concise indication and not a summary of the contents thereof, and they shall never be deemed to be the part of or be used in the interpretation or construction thereof or of the Contract.

1.33 Singular and Plural.

In this Contract document unless otherwise stated specifically the singular shall include the plural and vice-versa wherever the context so requires.

1.34 Cost

The cost shall be deemed to include overhead costs whether on or off the site.

1.35 Purchaser

The organization who is purchasing the goods/services.

ENGINEER & ENGINEER'S REPRESENTATIVE

2.0 Duties and Powers of the Engineer and the Engineer's Representative:

2.1 The field management shall be the responsibility of the Engineer. The Engineer shall carry out such duties as taking decisions and issuing

certificates and orders as specified in the Contract. The Engineer is empowered to take decisions on the following matters:

- (a) Approval of subletting of any part of the works pursuant to **clause 4.0** hereof;
- (b) Certification of additional sums under **sub-clause 53(2)** hereof;
- (c) Determination of an extension of time pursuant to **clause 44.0** hereof;
- (d) Issuance of a variation order pursuant to **clause 52.0** hereof;
- (e) Fixing rates or prices for the additional works executed under the Contract pursuant to **clause 52.0** hereof.

2.2 The Engineer's Representative shall be responsible to the Engineer and his duties are to watch and supervise the works and to test and examine any materials to be used or workmanship employed with the works. The Contractor shall get the materials or the workmanship tested, as instructed by the Engineer's Representative, at his own cost. He shall have no authority to relieve the Contractor of any of his duties or obligations under the Contract nor, except as expressly provided hereunder or elsewhere in the Contract, to order any work involving delay or any extra payment by the Service Recipient/ IDMC LTD, nor to make any variation of or in the works.

2.3 The IDMC LTD may from time to time in writing delegate to the Engineer's Representative any of the powers and authorities vested in the Engineer. Any written instruction or approval given by the Engineer's Representative to the Contractor within the terms of such delegations, but not otherwise, shall bind the Contractor as though it had been given by the Engineer provided always as follows:

- (a) Failure of the Engineer's Representative to disapprove any work or materials shall not prejudice the power of the Engineer thereafter to disapprove such work or materials and to order the pulling down, removal or breaking up thereof.
- (b) If the Contractor shall be dissatisfied by reason of any decision of the Engineer's Representative he shall be entitled to refer the matter to the Engineer, who shall there upon confirm, reverse or vary such decision.

3.0 Inspection of Works:

3.1 The IDMC LTD and his representatives shall have full power and authority to inspect the works at any time wherever the work is in progress either on the site or at the Contractor's premises/ workshop wherever situated, premises/ workshop of any person, firm or corporation where the work in connection with the Contract may be in hand or wherefrom materials are being produced or are to be supplied, and the Contractor shall afford or procure for the Engineer every facility and assistance to carry out such inspection. The Contractor shall at all times during usual working hours and at all other times at which reasonable notice of the intention of the Engineer or the Engineer's Representative to visit the works shall have been given to the Contractor, either himself be present to receive the orders and instructions, or have a responsible agent /representative duly accredited in writing present for the purpose. Orders given to the Contractor's agent/ representative shall be considered to have the same force as if they had been given to the Contractor himself. The Contractor shall give not less than **three days** notice in writing to the Engineer's Representative before covering up or otherwise placing beyond the reach of inspection and measurement any work in order that the same may be inspected and measured. In the event of breach of the above the same shall be uncovered at the Contractor's expenses for carrying out such measurement or inspection.

3.2 No materials shall be removed from the site before obtaining the approval in writing of the Engineer. The Contractor is to provide at all times during the progress of the work and the maintenance period proper means of access with ladders, gangways, etc. and the necessary attendance to move and adopt as directed for inspection or measurement of the works by the Engineer's Representative.

3.3 The Contractor shall make available to the Engineer's Representative free of cost all necessary instruments and assistance in checking of setting out of works and checking of any works made by the Contractor for the purpose of setting out and taking measurements of works.

3.4 Nothing in this clause shall in any way relieve the contractor from any warranty or other obligations under the contract.

4.0 Sub-letting of Work:

4.1 The Contractor shall not sub-let the whole of the works. Except where otherwise provided by the Contract, the Contractor shall not sub-let any part of the works without prior written consent of the Engineer, which shall not be unreasonably withheld, and such consent, if given

shall not relieve the Contractor from any liability or obligation under the Contract and he shall be responsible for the acts, defaults and negligence of any sub-contractor, his agents, servants or workmen as fully as if they were the acts, defaults or negligence of the Contractor, his agents, servants or workmen, provided always that the provision of labour on a piece work basis shall not be deemed to be a sub-letting under this clause.

CONTRACT DOCUMENT

5.0 Language and Law of Contract:

- 5.1** i) All written material and correspondence shall be in **English**.
ii) The law to which the Contract is to be subjected and according to which the Contract is construed, shall be the law being in force in India and/or the state where the Contract shall be performed.

5.2 Documents Mutually Explanatory:

Except if and to the extent otherwise provided by the Contract, the provisions of the General Conditions and Special Conditions of the Contract shall prevail over those of any other documents forming part of the Contract. Several documents forming the Contract are to be taken as mutually explanatory. Should there be any discrepancy, inconsistency, error or omission in the Contracts or any of them the matter may be referred to Engineer who shall give his decisions and issue to the Contractor instructions, directing in what manner the work is to be carried out. The decision of the Engineer shall be final and conclusive and the Contractor shall carry out the work in accordance with this decision.

- 5.3** Works shown upon the drawing but not mentioned in the specifications or described in the specifications without being shown on the drawings shall nevertheless be held to be included in the same manner as if they had been specifically shown upon the drawings and described in the specifications.

6.0 Drawings: their Purpose and the Custody:

- 6.1** The Contract drawings read together with the Contract specifications are intended to show and explain the manner of executing the work and to indicate the type and the class of materials to be used.
- 6.2** In case any feature of the work is not set forth in the drawings and specifications, the Contractor shall forthwith apply to the Engineer for further instructions, drawings or specifications.

6.3 The drawings shall remain in the sole custody of the Engineer, but two copies shall be issued to the Contractor free of charge. One copy of the drawings, furnished to the Contractor as aforesaid, shall be kept by the Contractor on the site and the same shall at all reasonable times be available for inspection and use by the Engineer or the Engineer's Representative and by any other person authorized by the Engineer in writing. At the completion of the Contract the Contractor shall return to the Engineer all drawings issued under the Contract. The drawings and specifications issued are sole property of the Purchaser/ Consultants and these can not be reproduced/ copied or used for any other works without a written consent of the Purchaser/ Consultant.

6.4 The Contractor shall give written notice to the Engineer whenever planning or progress of the works is likely to be delayed unless any further drawing or instruction is issued by the IDMC LTD/ Engineer within a reasonable time. The notice shall include the details of the drawing or instruction required and of why and by when it is required and of any delay or disruption likely to be suffered if it is late.

6.5 The contractor shall submit the following information, in triplicate, to the Engineer for approval within the time stipulated against each item below:

- a) A general layout plan of construction plant and equipment for the execution of work within **fourteen days** from the date of notice to proceed with the work; and
- b) drawings or prints showing the location of major plants and other facilities which he proposes to put up at the site, including any changes in the general layout, at least **fourteen days** prior to the commencement of the respective work.

7.0 Further Drawings and Instructions:

7.1 The Engineer may also authorize his representatives to perform his duties and functions. The Contractor shall carry out and be bound by the same. The Engineer shall have full powers and authority to supply to the Contractor from time to time, during the progress of the works, such further drawings and instructions as shall be necessary for the proper execution of the project.

GENERAL OBLIGATIONS

8.0 Contractor's General Responsibilities:

8.1 The Contractor shall, subject to the provisions of the Contract, and with due care and diligence, execute and maintain the Works and

provide all labour, including the supervision thereof, materials, Construction Plant and all other things, whether of a temporary or permanent nature, required in and for such execution and maintenance, so far as the necessity for providing the same is specified in or is reasonably to be inferred from the Contract.

8.2 The Contractor shall take full responsibility for the adequate stability and safety of all site operations and methods of construction, provided that the Contractor shall not be responsible, except as may be expressly provided in the Contract, for the design or specification of the Permanent Works, or for the design or specification of any Temporary Works prepared by the Engineer.

9.0 Contract Agreement:

9.1 The Contractor shall be called upon so to do enter into and execute a Contract Agreement, in the form provided at **Section VIII (Form of Agreement)** with such modification as may be necessary.

10.0 Performance Security:

10.1 Within **30 days** of the receipt of the notification of the Award of the Contract from the IDMC LTD the successful bidder shall furnish to the IDMC LTD a performance security for an amount of **5% (five percent)** of the total Contract cost.

10.2 The proceeds of the performance e security shall be payable to the IDMC LTD as compensation for any loss resulting from the Contractor's failure to complete his obligation under the Contract.

10.3 The performance security shall be **denominated** in Indian Rupees and shall be in any of the following forms:

- a) A Demand draft drawn in favour of the IDMC Limited, payable at the place mentioned in the address of communication stated in the Invitation for Bid (**Section O**).
- b) A Bank Guarantee issued by a Nationalized Indian Bank or a foreign bank having branches in India. The acceptable form shall be strictly as provided in **Section IX (Acceptable Forms OF Bank Guarantees)** of the Bidding documents.

10.4 The bank guarantee (B.G.) shall be valid till successful commissioning and final acceptance of the plant and fulfilment of all contractual obligation and accepted by the IDMC engineer/consultant **plus 3 months claim period**. The B.G. can be initially accepted for a period as per Banking norms, on written undertaking of contractor/ bidder that the BG shall be extended before its expiry & shall be kept

valid till successful commissioning and final acceptance of the plant and fulfilment of all contractual obligation and accepted by the IDMC engineer/consultant **plus 3 months claim period**. The validity of the bank guarantee shall be suitably extended in the event of extension of time of the Contract pursuant **to clause no. 44** herein.

10.5 The performance security shall be released by the IDMC LTD not later than **60 days** following the date of delivery of the Maintenance certificate by the Engineer.

10.6 In the event of increase in the Contract cost, in actual execution, proportionate additional performance security shall be provided by the Contractor or recovered from the subsequent payments due to the contractor.

10.7 In the event of decrease in the Contract cost the performance security shall be proportionately adjusted on the completion of the work.

10.8 No interest shall be paid by IDMC LTD for the amount deposited as Performance security with the IDMC LTD.

11.0 Inspection of Site:

11.1 The Contractor shall be deemed to have inspected and examined the site and its surroundings and information available in connection therewith and to have satisfied himself, before submitting his Tender, as to the form and nature thereof, including the sub-surface conditions, the hydrological and climatic conditions, the extent and nature of work and materials necessary for the completion of the Works, the means of access to the Site and accommodation he may require and, in general, shall be deemed to have obtained all necessary information, subject as above mentioned, as to risks, contingencies and all other circumstances which may influence or affect his Tender.

12.0 Sufficiency of Tender:

12.1 The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his Tender for the Works and of the rates and prices stated in the priced Schedule of Quantities and the Schedule of Rates and Prices, if any, which Tender rates and prices shall, except insofar, as it is otherwise provided in the Contract, cover all his obligations under the Contract and all matters and things necessary for the proper execution and maintenance of the Works.

13.0 Work to be to the Satisfaction of Engineer:

13.1 The Contractor shall execute and maintain the Works in strict accordance with the Contract to the satisfaction of the Engineer and shall comply with and adhere strictly to the Engineer's instructions and directions on any matter whether mentioned in the Contract or not, touching or concerning the Works. The Contractor shall take instructions and directions only from the Engineer.

14.0 Programme to be furnished:

14.1 The Contractor shall, after the acceptance of his Tender, submit to the Engineer for his approval a program showing the order of procedure in which he proposes to carry out the Works. The Contractor shall whenever required by the Engineer, also provide in writing for his information a general description of the arrangements and methods which the Contractor proposes to adopt for the execution of Works.

14.2 If at any time it should appear to the Engineer that the actual progress of the Works does not conform to the approved program referred to in **sub-clause (1)** of this Clause, the Contractor shall produce, at the request of the Engineer, a revised programme showing the modifications to the approved programme necessary to ensure completion of the Works within the time for completion as defined in **Clause 43** hereof.

14.3 The submission to and approval by the Engineer of such programme or the furnishing of such particulars shall not relieve the Contractor of any of his duties or responsibilities under the Contract.

14.4 The programme shall be reviewed and revised if required at three monthly intervals and shall include a chart of the principal quantities of work forecast for execution monthly and a schedule of payments expected to be made to the Contractor by the IDMC LTD.

15.0 Contractor's Superintendence:

15.1 The Contractor shall give or provide all necessary superintendence during the execution of the Works and as long thereafter as the Engineer may consider necessary for the proper fulfilling of the Contractor's obligations under the Contract. The Contractor, or a competent and authorized agent or representative approved of in writing by the Engineer, which approval may at any time be withdrawn, is to be constantly on the Works and shall give his whole time to the superintendence of the same. If such approval shall be withdrawn by the Engineer, the Contractor shall, as soon as is practicable, having regard to the requirement of replacing him as hereinafter mentioned, after receiving written notice of such withdrawal, remove the agent from the Works and shall not thereafter

employ him on the Works in any capacity and shall replace him by another agent approved by the Engineer. Such authorized agent or representative shall receive, on behalf of the Contractor, directions and instructions from the Engineer.

16.0 Contractor's Employees:

16.1 The Contractor shall provide and employ on the Site in connection with the execution and maintenance of the Works:

- a) Only such technical assistants as are skilled and experienced in their respective fields and sub-agents, foremen and leading hands as are competent to give proper supervision to the work they are required to supervise, and
- b) Such skilled, semi-skilled and unskilled labour as is necessary for the proper and timely execution and maintenance of the Works.

16.2 It shall be the liability of the Contractor to remove forthwith from the works any personnel engaged by the Contractor, in or about the execution or maintenance of the works, who, misconduct himself or is incompetent or negligent in the proper performance of his duties or whose engagement is otherwise considered to be undesirable and such person shall not be again engaged upon the work. Any person so removed, by the Contractor, from the works shall be replaced, by the Contractor, as soon as possible by a competent substitute.

17.0 Setting-out:

17.1 The Contractor shall be responsible for the true and proper setting-out of the Works in relation to original points, lines and levels of reference given by the Engineer in writing and for the correctness, subject as above mentioned of the position, levels, dimensions and alignment of all parts of the Works and for the provision of all necessary instruments, appliances and labour in connection therewith. If at any time, during the progress of the Works, any error shall appear or arise in the position, levels dimensions or alignment of any part of the Works, the Contractor, on being required so to do by the Engineer shall, at his own cost, rectify such error to the satisfaction of the Engineer, unless such error is based on incorrect data supplied in writing by the Engineer in which case the expense of rectifying the same shall be borne by the IDMC LTD. The checking of any setting-out or of any line or level by the Engineer shall not in any way relieve the Contractor of his responsibility for the correctness thereof and the Contractor shall carefully protect and preserve all bench- marks, sight-rails, pegs and other things used in setting- out the Works.

18.0 Boreholes and Exploratory Excavation:

18.1 If, at any time during the execution of the Works, the Engineer shall require the Contractor to make boreholes or to carry out exploratory excavation, such requirement shall be ordered in writing and shall be deemed to be an addition ordered under the provision of **Clause 52** hereof, unless a provisional sum in respect of such anticipated works shall have been included in Schedule of Quantities.

19.0 Watching and Lighting:

19.1 The Contractor shall in connection with the Works provide and maintain at his own cost all lights, guards, fencing and watching when and where necessary or required by the Engineer, for the protection of the Works, or for the safety and convenience of the public or others.

20.0 Care of Works:

20.1 From the commencement of the Works until the date stated in the Certificate of Completion for the whole of the Works pursuant to **Clause 49** hereof the Contractor shall take full responsibility for the care thereof. Provided that if the Engineer shall issue a Certificate of Completion in respect of any part of the Permanent Works the Contractor shall cease to be liable for the care of that part of the Permanent Works from the date stated in the Certificate of Completion in respect of that part and the responsibility for the care of that part shall pass to the Owner/ IDMC LTD. Provided further that the Contractor shall take the full responsibility for the care of any outstanding work which he shall have undertaken to finish during the Period of maintenance until such outstanding work is completed. In case any damage, loss or injury shall happen to the Works, or to any part thereof, from any cause whatsoever, save and except the excepted risks as defined in **clause 20.3**, while the Contractor shall be responsible for the care thereof the Contractor shall, at his own cost, repair and make good the same, so that at completion the Permanent Works shall be in good order and condition and in conformity in every respect with the requirements of the Contract and the Engineer's instructions. In the event of any such damage, loss or injury happening from any of the excepted risks, the Contractor shall, if and to the extent required by the Engineer and subject always to the provision of **Clause 66** hereof, repair and make good the same as aforesaid at the cost of the IDMC LTD. The Contractor shall also be liable for any damage to the Works occasioned by him in the course of any operations carried out by him for the purpose of completing any outstanding work or complying with his obligations under **Clause 50 or 51** hereof.

20.2 The Contractor shall not demolish, remove or alter the structures, trees or other facilities on the site without the prior approval of the Engineer.

20.3 Excepted Risks:

The "excepted risks" are war, hostilities (whether war be declared or not), invasion, act of foreign enemies, rebellion, revolution insurrection or military or usurped power, civil war, or unless solely restricted to employees of the Contractor or of his sub-contractors and arising from the conduct of the Works, riot, commotion or disorder, or a cause solely due to the Engineer's design of the Works, or ionizing radiation or contamination by radio-activity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive, or other hazardous properties of any explosive, nuclear assembly or nuclear component thereof, pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds, or any such operation of the forces of nature as an experienced Contractor could not foresee, or reasonably make provisions for or insure against all of which are herein collectively referred to as "the excepted risks".

21.0 Insurance of Works, etc.:

21.1 Without limiting his obligations and responsibilities, the Contractor shall prior to the commencement of the Works (**as per appendix-I, Section-V**) insure in the joint names of the Service Recipient and the Contractor by naming Service Recipient as the beneficiary against all losses or damages from whatever cause arising, other than the excepted risks, for which he is responsible under the terms of the Contract and in such manner that the Service Recipient and the Contractor are covered for the period stipulated for loss or damage arising from a cause, occurring prior to the commencement of the Period of maintenance. The realized claim amount by Service Recipient shall be reimbursed to the contractor after making good of the damages by the contractor. **Copy of the insurance policies shall be submitted prior to commencement of the work.**

- a) The Works for the time being executed to the estimated current Contract cost thereof **plus 10 percent** thereon to allow for any additional costs and professional fees resulting from the loss or damage.
- b) The Constructional Plant and other things brought on to the Site by the Contractor to the replacement value of such Constructional Plant and other things.

- c) It shall be the responsibility of the Contractor to notify the insurer of any change in nature and extent of the Works and to ensure the adequacy of the insurance cover at all times in accordance with the provisions of this Clause.

Such insurance shall be effected with an insurer and the Contractor shall, produce to the Engineer/IDMC LTD the policy or policies of insurance and the receipts for payments of the current premiums.

22.0 Damage to Persons and Property:

22.1 The Contractor shall, except if and so far as the Contract provides otherwise, indemnify the IDMC LTD against all losses and claims in respect of injuries or damage to any person or material or physical damage to any property whatsoever which may arise out of or in consequence of the execution and against all claims, proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto except any compensation or damages for or with respect to:-

- a) The permanent use or occupation of land by the Works or any part thereof.
- b) The right of the IDMC LTD to execute the Works or any part thereof on, over, under, in or through any land.
- c) Injuries or damage to persons or property which are the unavoidable result of the execution or maintenance of the Works in accordance with the Contract.
- d) Injuries or damage to persons or property resulting from any act or neglect of the Engineer or other Contractors, not being employed by the Contractor, or for or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or where the injury or damage was contributed to by the Contractor, his servants or agents such part of compensation as may be just and equitable having regard to the extent of the responsibility of the Engineer or other Contractors for the damage or injury.

22.2 The contractor shall indemnify the IDMC LTD/Purchaser/Owner against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the provision to **sub-clause (1)** of this Clause.

23.0 Third Party Insurance:

23.1 Before commencing the execution of the Works the Contractor, but without limiting his obligations and responsibilities under **Clause 22** hereof, shall insure against his liability for any material or physical damage, loss or injury which may occur to any property, including that of the owner/ IDMC LTD, or to any person, including any employee of the owner/ IDMC LTD, or by arising out of the execution of Works or in the carrying out of the Contract, otherwise than due to the matters, referred to in the provision to **Clause 22.1** hereof.

23.2 Such insurance shall be effected with an insurer. The Contractor shall, produce to the Engineer/ IDMC LTD the policy or policies of insurance and the receipts for payment of the current premiums.

23.3 The terms shall include a provision whereby, in the event of any claim in respect of which the Contractor would be entitled to receive indemnity under the policy being brought or made against the IDMC LTD, the insurer will indemnify the IDMC LTD against such claims and any costs, charges and expenses in respect thereof.

23.4 Such insurance shall be for 10 % of the value of works with number of unlimited occurrences.

24.0 Accident or Injury to Workmen:

24.1 The IDMC LTD shall not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any workman or other person in the employment of the Contractor or any sub- Contractor. The Contractor shall indemnify and keep indemnified the IDMC LTD against all such damages and compensation, save and except as aforesaid, and against all claims, proceedings, costs, charges and expenses whatsoever in respect thereof or in relation thereto. Where any case is instituted against the IDMC LTD, the Contractor shall implead himself as a party as if the case has been instituted against the Contractor.

24.2 The Contractor shall insure against such liability with an insurer and shall continue such insurance during the whole of the time that any persons are employed by him on the Works and shall, produce to the Engineer/ IDMC LTD such policy of insurance and the receipts for the payment of the current premium. Provided always that, in respect of any person employed by any sub-contractor, the Contractor's obligation to insure as aforesaid under this sub-clause shall be satisfied if the sub-contractor shall have insured against the liability in respect of such persons in such manner that the IDMC LTD is indemnified under the policy, but the Contractor shall require such sub-contractor

to produce to the Engineer/ IDMC LTD such policy of insurance and receipt for the payment of the current premium.

24.3 Employee State Insurance (ESI) Act:

The Contractor shall accept full and exclusive liabilities for the compliance with all obligations imposed by the ESI Act 1948, and the Contractor shall further defend, indemnify and hold the Owner/IDMC LTD harmless from any liabilities or penalties which may be imposed by the Central, State or local authorities by reason of any asserted violation by Contractor or sub-contractor of the ESI Act, 1948 and also from all claims, suits or proceedings that may be brought against the Owner/IDMC LTD arising under, growing up or by reason of the work provided for by this Contract whether brought by the employees of the Contractor, by the third parties, or by Central or State Govt. authorities or any political sub-division thereof. The Contractor shall fill in with the ESI the declaration form and all other forms which may be required in respect of the Contractor's or sub-contractor's employees and who are employed by for the works provided for or those covered by ESI from time to time under the agreement. The Contractor shall deduct and secure the agreement of the sub-contractor and deduct the employee's contribution as per the first schedule of the ESI Act from wages and affix the employees' contribution cards at wages payment intervals. The Contractor shall remit and secure that agreement of the sub- contractor to remit, the employees' contribution as required by the Act. The Contractor shall maintain all codes and records as required under Act in respect of the employees and payment and the Contractor shall secure the agreement of the sub-contractor to maintain such records. Any expense incurred for the contribution or maintaining records shall be to the Contractor's account.

The Owner/IDMC LTD shall retain such amount as may be necessary from the total Contract cost until the Contractor shall furnish satisfactory proof the whole contribution as required by the ESI Act have been paid.

25.0 Remedy on Contractor's Failure to Insure:

25.1 The contractor shall not start work at site without prior written consent/ permission accorded by the site engineer which shall not be accorded in absence of, inter-alia, the required insurance policies. However, if the contractor fails to effect and keep in force the required insurance policies and commences work without authorisation, the Contractor shall be solely responsible for any damage or loss.

In addition to this, the failure of the contractor in meeting the above requirements would result in the following penalties:

- a) A penalty @ 0.05% of the contract value shall be imposed (by way of deductions from his bills) on the contractor if the contractor fails to submit the required insurance policy and starts work without due authorization.
- b) If the contractor fails to extend/renew any of the existing insurance policies before expiry, for every default in any of the insurance policy a penalty @ 0.05% of the contract value shall be imposed (by way of deductions from his bills) on the contractor. The maximum penalty for such defaults would be limited to 0.10% of the contract value.

26.0 Giving of Notices and Payment of Fees:

26.1 The Contractor shall give all notices and pay all fees required to be given or paid by any National or State Statute, Ordinance, or Law, or any regulation, or bye-law of any local or other duly constituted authority in relation to the execution of the Works and by the rules and regulations of all public bodies and companies whose property or rights are affected or may be affected in any way by the Works.

26.2 The Contractor shall conform in all respects with the provisions of any such Statute, Ordinance or Law as aforesaid and the regulations or bye-laws of any local or other duly constituted authority which may be applicable to the Works and with such rules and regulations of public bodies and companies as aforesaid and shall keep the IDMC LTD

indemnified against all penalties and liability of every kind for breach of any such Statute, Ordinance or Law, regulation or bye-law.

26.3 The IDMC LTD will repay or allow to the Contractor all such sums as the Engineer/IDMC LTD shall certify to have been properly payable and paid by the Contractor in respect of such fees.

27.0 Fossils, etc.:

27.1 All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the site of the Works shall as between the IDMC LTD and the Contractor be deemed to be the absolute property of the IDMC LTD. The Contractor shall take precautions to prevent his workmen or any other persons from removing or damaging any such article or thing and shall immediately upon discovery thereof and, before removal, acquaint the Engineer of such discovery and carry out the Engineer's orders as to the disposal of the same.

28.0 Patent Rights and Royalties:

28.1 The Contractor shall save harmless and indemnify the IDMC LTD from and against all claims and proceedings for or on account of infringement of any patent rights, design trademark or name or other protected rights in respect of any Constructional Plant, machine work, or material and for in connection with the Works or any of them and from and against all claims, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto. Except where otherwise specified, the Contractor shall pay all tonnage and other royalties, rent and other payments or compensation, if any, for getting stone, sand, gravel, clay or other materials required for the Works or any of them.

29.0 Interference with Traffic and Adjoining Properties:

29.1 All operations necessary for the execution of the Works shall, so far as compliance with the requirements of the Contract permits, be carried on so as not to interfere unnecessarily or improperly with the convenience of the public, or the access to, use and occupation of public or private roads and footpaths to or of properties whether in the possession of the IDMC LTD or of any other person. The Contractor shall save harmless and indemnify the IDMC LTD in respect of all claims, proceedings, damages, costs, charges and expenses whatsoever arising out of, or in relation to, any such matters in so far as the Contractor is responsible, therefore.

30.0 Extraordinary Traffic:

- 30.1** The Contractor shall use every reasonable means to prevent any of the highways or bridges communicating with or on the routes to the Site from being damaged or injured by any traffic of the Contractor or any of his sub-contractors and, in particular, shall select routes, choose and use vehicles and restrict and distribute loads so that any such extraordinary traffic as will inevitably arise from the moving of plant and material from and to the Site shall be limited, as far as reasonably possible, and so that no unnecessary damage or injury may be occasioned to such highways and bridges.
- 30.2** Should it be found necessary for the Contractor to move one or more loads of Constructional Plant, machinery or pre-constructed units or parts of units of work over a part of a highway or bridge, the moving whereof is likely to damage any highway or bridge unless special protection or strengthening is carried out, then the Contractor shall before moving the load on to such highway or bridge give notice to the concerned authority of the weight and other particulars of the load to be moved and his proposals for protecting or strengthening the said highway or bridge and obtain approval from that concerned authority at his own cost. He shall keep the Engineer informed of the action taken.
- 30.3** If during the execution of the Works or at any time thereafter the Contractor shall receive any claim arising out of the execution of the Works in respect of damage or injury to highways or bridges he shall immediately report the same to the Engineer and thereafter shall negotiate the settlement of and pay all sums due in respect of such claim and shall indemnify the IDMC LTD in respect thereof and in respect of all claims, proceedings, damages, costs, charges and expenses in relation thereto.
- 30.4** Where the nature of the Works is such as to require the use by the Contractor of water-borne transport the foregoing provisions of this Clause shall be construed as though "highway" included a lock, dock, sea wall or other structure related to a waterway and "vehicle" included craft, and shall have effect accordingly.
- 31.0 Opportunities for other Contractors:**
- 31.1** The Contractor shall, in accordance with the requirements of the Engineer, afford all reasonable opportunities for carrying out their work to any other Contractors employed by the IDMC LTD/owner and their workmen and to the workmen of the IDMC LTD/owner and of any other duly constituted authorities who may be employed in the execution on or near the Site of any work not included in the Contract or of any Contract which the IDMC LTD may enter into in connection with or

ancillary to the Works. If, however, the Contractor shall, on the written request of the Engineer, make available to any such other Contractor, or to the IDMC LTD or any such authority, any roads or ways for the maintenance of which the Contractor is responsible, or permit the use by any such of the Contractor's scaffolding or other plant on the Site, or provide any other service of whatsoever nature for any such, the IDMC LTD shall pay to the Contractor in respect of such use or service such sum or sums as shall, in the opinion of the Engineer, be reasonable.

32.0 Contractor to Keep Site Clear:

32.1 During the progress of the Works the Contractor shall keep the site reasonably free from all unnecessary obstructions and shall store or dispose of any Constructional Plant and surplus materials and clear away and remove from the site any wreckage, rubbish or Temporary Works no longer required.,

33.0 Clearance of Site on Completion:

33.1 On the completion of the Works the Contractor, at his own cost, shall clear away and remove from the Site all Constructional Plant, surplus materials, rubbish and Temporary Works of every kind, and leave the whole of the Site and Works clean and in a workmanlike condition to the satisfaction of the Engineer. However for removal of surplus excavated earth & existing material, payment shall be made separately as per relevant tender item.

L A B O U R**34.0 Engagement of Labour:**

34.1 The Contractor shall make his own arrangements for the engagements of all labour, local or otherwise, and, save insofar as the Contract otherwise provides, for the transport, housing feeding and payment thereof. The Contractor to the extent possible and reasonable to employ staff and labour with required qualifications and experience from source within India.

34.2 The Owner/IDMC LTD may at their own discretion and convenience make available at the site, land for Contractor's field office, godown, workshop and assembly yard required for the execution of the Contract. The Contractor shall at his own cost construct all these temporary buildings and provide suitable water supply and sanitary arrangement approved by the Engineer.

- 34.3** The personnel so engaged by the Contractor shall be the employees of the Contractor and there shall exist no probity of Contract between the personnel so engaged and the IDMC LTD/Owner.
- 34.4** On completion of the works undertaken by the Contractor, he shall remove all temporary buildings erected by him and have the site cleaned as directed by the Engineer. If the Contractor shall fail to comply with these requirements, the Engineer may at the expenses of the Contractor remove such surplus and rubbish materials and dispose off the same as he deems fit and get the site cleared as aforesaid; the Contractor shall forthwith pay the amount of all expenses so incurred and shall have no claim in respect of any such surplus material disposed off as aforesaid. The owner reserves the right to ask the Contractor any time during the tendency of the Contract to vacate the land by giving **7 day's** notice without giving any reason.
- 34.5** Land for residential accommodation for staff and labour may be made available at the discretion of the IDMC LTD / Engineer.
- 34.6** The Contractor shall, so far as is reasonably practicable, having regard to local conditions, provide on the Site, to the satisfaction of the Engineer an adequate supply of drinking and other water for the use of the Contractor's staff and work people.
- 34.7** The Contractor shall not, otherwise than in accordance with the Statutes, Ordinances and Government Regulations or Orders for the time being in force, import, sell, give, barter or otherwise dispose of any alcoholic liquor, or drugs or permit any such importation, sale, gift, barter or disposal by his sub-contractors, agents or employees.
- 34.8** The Contractor shall not give, barter or otherwise dispose of to any person or person, any arms or ammunitions of any kind or permit the same as aforesaid.
- 34.9** The Contractor shall in all dealings with labour in his employment, have due regard to all recognized festivals, days of rest and religious or other customs.
- 34.10** In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local medical or sanitary authorities for the purpose of dealing with and overcoming the same.
- 34.11** The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst his

employees and for the preservation of peace and protection of persons and property in the neighbourhood of the Works against the same. The Contractor shall be responsible to comply with the various labour laws such as **Contract Labour (R&A) Act, 1970, Payment of Wages Act, Minimum Wages Act, Provident Fund Act & Rules etc. in respect of the persons engaged by him.**

34.12 The Contractor shall be responsible for observance by his sub-contractors of the foregoing provisions.

35.0 Returns of Labour, etc.:

35.1 The Contractor shall submit to the IDMC LTD/Owner copies of the license under the Contract Labour Act, if required and obtained by the Contractor and his Provident Fund Number. The Contractor shall, if required by the Engineer, also deliver to the Engineer a return in detail in such form and at such intervals as the Engineer may prescribe showing the supervisory staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such information respecting Constructional Plant as the Engineer may require.

35.2 The Contractor shall not employ in connection with the works any person who has not **completed fifteen years of age.**

35.3 The Contractor shall in respect of labour employed by him comply with or cause to be complied with the provision of the various **labour laws and rules and regulations such as Contract Labour Act(R&A) Act, 1970, Payment of Wages Act, Minimum Wages Act, Provident Fund Act & Rules etc.** applicable to them in regard to all matters provided therein and shall indemnify the IDMC LTD in respect of all claims that may be made against the IDMC LTD for non-compliance thereof by the Contractor.

35.4 Notwithstanding anything contained herein, the Engineer may take such actions as may be necessary for compliance of the various labour laws and recover the costs thereof from the Contractor.

35.5 In the event of the Contractor committing a default or breach of any of the provisions of labour laws and rules and regulations as applicable, shall pay penalties as imposed by the statutory Authorities and shall indemnify and keep indemnified the IDMC LTD/Owner all such penalties and compensations.

MATERIALS AND WORKMANSHIP

36.0 Materials and Workmanship:

36.1 All materials and workmanship shall be of the respective kinds described in the Contract and in accordance with the Engineer's instructions and shall be subjected from time to time to such tests as the Engineer may direct at the place of manufacture or fabrication, or on the Site or at such other place or places as may be specified in the Contract, or at all or any of such places. The Contractor shall provide such assistance, instruments, machines, labour and materials as are normally required for examining, measuring and testing any work and the quality, weight or quantity of any material used and shall supply samples of materials before incorporation in the Works for testing as may be selected and required by the Engineer.

36.2 All samples shall be supplied by the Contractor at his own cost if the supply thereof is clearly intended by or provided for in the Contract.

36.3 The cost of conducting any test ordered by the Engineer to ascertain the quality of the materials and the workmanship shall be borne by the Contractor.

37.0 Inspection of Operations:

37.1 The Engineer and any person authorised by him shall at all times have access to the Works and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the Works and the Contractor shall afford every facility for and every assistance in or in obtaining the right to such access.

38.0 Examination of Work before covering up:

38.1 No work shall be covered up or put out of view without the approval of the Engineer and the Contractor shall afford full opportunity for the Engineer to examine and measure any work which is about to be covered up or put out of view and to examine foundations before permanent work is placed thereon. The Contractor shall give due notice to the Engineer whenever such work or foundations is or are ready or about to be ready for examination and the Engineer shall, unless he considers it unnecessary and advises the Contractor accordingly, attend for the purpose of examining and measuring such work or of examining such foundations.

38.2 The Contractor shall uncover any part or parts of the Works or make openings in or through the same as the Engineer may from time to time direct and shall reinstate and make good such part or parts to the satisfaction of the Engineer. If any such part or parts have been put out of view after compliance with the requirement of **clause 38.1**

and are found to be executed in accordance with the Contract, the expenses of uncovering, making openings in or through, reinstating and making good the same shall be borne by the IDMC LTD, but in any other case all costs shall be borne by the Contractor.

39.0 Removal of Improper Work and Materials:

39.1 The Engineer shall during the progress of the Works have power to order in writing from time to time.

a) The removal from the Site, within such time or times as may be specified in the order, of any materials which, in the opinion of the Engineer, are not in accordance with the Contract.

b) The substitution of proper and suitable materials and

c) The removal and proper re-execution, notwithstanding any previous test thereof or interim payment therefore, of any work which in respect of materials or workmanship is not, in the opinion of the Engineer, in accordance with the Contract.

39.2 In case of default on the part of the Contractor in carrying out such order, the IDMC LTD shall be entitled to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be recoverable from the Contractor by the IDMC LTD or may be deducted by the IDMC LTD from any payment due or which may become due to the Contractor.

40.0 Suspension of Work:

40.1 The Contractor shall, on the written order of the Engineer, suspend the progress of the Works or any part thereof for such time or times and in such manner as the Engineer may consider necessary and shall during such suspension properly protect and secure the work, so far as is necessary in the opinion of the Engineer. The extra cost incurred by the Contractor in giving effect to the Engineer's instructions under this Clause shall be borne and paid by the IDMC LTD unless such suspension is:

a) Otherwise provided for in the Contract, or

b) Necessary by reasons of some default on the part of the Contractor, or

c) Necessary by reason of climatic conditions on the Site, or

d) Necessary for the proper execution of the Works or for the safety of the Works or any part thereof insofar as such necessity does not arise from any act or default by the Engineer or the IDMC LTD or from any of the excepted risks defined in **Clause 20** hereof.

Provided that the Contractor shall not be entitled to recover any such extra cost unless he gives written notice of his intention to claim to the Engineer within **fifteen days** of the Engineer's order. The Engineer shall settle and determine such extra payment and/or extension of time under **Clause 44** hereof to be made to the Contractor in respect of such claim as shall, in the opinion of the Engineer, be fair and reasonable.

- 40.2** If the progress of the Works or any part thereof is suspended on the written order of the Engineer and if permission to resume work is not given by the Engineer within a period of **ninety days** from the date of suspension then, unless such suspension is within paragraph (a), (b), (c) or (d) of sub-clause (1) of this Clause, the Contractor may serve a written notice on the Engineer requiring permission within **twenty-eight days** from the receipt thereof to proceed with the Works, or that part thereof in regard to which progress is suspended and, if such permission is not granted within the time, the Contractor by a further written notice so served may, but is bound to, elect or treat the suspension where it affects only part of the Works as an omission of such part under **Clause 52** hereof, or, where it affects the whole Works, as an abandonment of the Contract by the Service Recipient/IDMC LTD.

COMMENCEMENT TIME AND DELAYS

41.0 Commencement of Works:

- 41.1** The Contractor shall commence the Works on Site within the period named in the **Appendix to the Tender (Form of Bid)** after the receipt by him of a written order to this effect from the Engineer and shall proceed with the same with due expedition and without delay, except as may be expressly sanctioned or ordered by the Engineer or be wholly beyond the Contractor's control.

42.0 Possession of Site:

- 42.1** Save insofar as the Contract may prescribe, the extent of portions of the Site of which the Contractor is to be given possession from time to time and the order in which such portions shall be made available to him and, subject to any requirement in the Contract as to the order in which the Works shall be executed, the IDMC LTD will, with the Engineer's written order to commence the Works, give to the Contractor

possession of so much of the Site as may be required to enable the Contractor to commence and proceed with the execution of the Works in accordance with the programme referred to in **Clause 14** hereof, if any, and otherwise in accordance with such reasonable proposals of the Contractor as he shall, by written notice to the Engineer, make and will, from time to time as the Work proceed, give to the Contractor possession of such further portions of the Site as may be required to enable the Contractor to proceed with the execution of the Works with due dispatch in accordance with the said programs or proposals, as the case may be. If the Contractor suffers delay from the failure on the part of the IDMC LTD to give possession in accordance with the terms of this Clause, the Engineer shall grant an extension of time for the completion of the Works as, in his opinion shall be fair.

42.2 The Contractor shall bear all costs and charges for special or temporary way leaves required by him in connection with access to the Site. The Contractor shall also provide at his own cost any additional accommodation outside the Site required by him for the purposes of the Works.

43.0 Time for Completion:

43.1 Subject to any requirement in the Contract as to completion of any section of the Works before completion of the whole, the whole of the Works shall be completed, in accordance with the provisions of **Clause 49** hereof, within the time stated in the Contract or such extended time as may be allowed under **Clause 44** hereof.

43.2 Upon acceptance of the bid, the contractor shall submit to the Purchaser/IDMC LTD for his approval a comprehensive work programme in the form of **Bar chart** indicating the critical activities as well. After approval by the Purchaser/IDMC LTD, the contractor shall strictly adhere to the sequence of activities stated therein. The contractor shall review the actual progress of work in each month, in relation to the approved programme and shall inform the Purchaser/IDMC LTD. The submission to and approval by the Purchaser/IDMC LTD of the programme shall not relieve the contractor of any of his duty and responsibility under the contract.

43.3 Time is the essence of the contract to the responsive bidder.

44.0 Extension of Time of Completion:

44.1 Should the amount of extra or additional work of any kind or any cause of delay referred to in these Conditions, or exceptional adverse climatic conditions, or other special circumstances of any kind whatsoever which may occur, other than through a default of the Contractor, be such as fairly to entitle the Contractor to an extension of time for the completion of the Works, the Engineer shall determine

the amount of such extension and shall notify the IDMC LTD and the Contractor accordingly. Provided that the Engineer is not bound to take in account any extra or additional work or other special circumstances unless the Contractor has within thirty days after such work has been commenced, or such circumstances have arisen, or as soon thereafter as is practicable, submitted to the Engineer full and detailed particulars of any extension of time to which he may consider himself entitled in order that submission may be investigated at the time.

45.0 No Night Work:

45.1 Subject to any provision to the contrary contained in the Contract, none of the Permanent Works shall, save as hereinafter provided, be carried on during the night without the permission in writing of the Engineer except when the work is unavoidable or absolutely necessary for the saving of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Engineer. Provided always that the provisions of this Clause shall not be applicable in the case of any work which it is customary to carry out by rotary or double shifts.

46.0 Rate of Progress:

46.1 If for any reason, which does not entitle the Contractor to an extension of time, the rate of progress of the Works or any section is at any time, in the opinion of the Engineer, too slow to ensure completion by the prescribed time or extended time for completion, the Engineer shall so notify the Contractor in writing and the Contractor shall thereupon take such steps as are necessary and the Engineer may approve to expedite progress so as to complete the Works or such section by the prescribed time or extended time. The Contractor shall not be entitled to any additional payment for taking such steps. If, as a result of any notice given by the Engineer under this Clause, the Contractor shall seek the Engineer's permission to do any work at night, such permission shall not be unreasonably refused.

47.0 Liquidated Damages for Delay:

47.1 If the Contractor shall fail to achieve completion of the Works within the time prescribed in the **Appendix to the Form of Bid**, then the Contractor shall pay to the IDMC LTD the sum at the rate of **0.5% (zero point five percent)** of the amended up-to date total contract cost as liquidated damages for such default and not as a penalty for **each completed week** (week comprising of **7 days** including holidays and any incomplete week shall be ignored for the calculation of liquidated damages) which shall elapse between the time prescribed by **clause**

43 hereof and the date of certified completion of the particular Works. The IDMC LTD may without prejudice to any other method of recovery, deduct the amount of such damages from any payment in its hands, due or which may become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligations and liabilities under the Contract.

47.2 The aggregate maximum of the liquidated damages payable to the IDMC LTD under this clause shall be subject to a maximum of **10% (ten percent) of the total order / Contract cost** (i.e. value indicated in letter of acceptance or any subsequent amendment, accepted by the contractor).

47.3 If, before the completion of the whole of the Works any part or section of the Works has been certified by the Engineer as completed, pursuant to **Clause 49** hereof, and occupied by the Owner/IDMC LTD, the liquidated damages for delay shall, for any period of delay after such certificate be reduced in the proportion which the value of the part or section so certified bears to the value of the whole of the Works.

47.4 The criteria for deriving the liquidated damage shall be the actual value of works executed and the amended time of completion.

48.0 Bonus For Early Completion: NOT APPLICABLE FOR THIS CONTRACT.

49.0 Certification of Completion of Works:

49.1 When the whole of the Works have been virtually completed and have satisfactorily passed any final test that may be prescribed by the Contract, the Contractor may give a notice to that effect to the Engineer accompanied by an undertaking to finish any outstanding work during the period of Maintenance. Such notice and undertaking shall be in writing and shall be deemed to be a request by the Contractor for the Engineer to issue a Certificate of Completion in respect of the Works. The Engineer shall, on receipt of such notice either issue to the Contractor, with a copy to the Service Recipient/IDMC LTD, a Certificate of Completion stating the date on which, in his opinion, the Works were virtually completed in accordance with the Contract or give instructions in writing to the Contractor specifying all the work which, in the Engineer's opinion, requires to be done by the Contractor before the issue of such Certificate. The Engineer shall also notify the Contractor of any defects in the Works affecting virtual completion that may appear after such

instructions and before completion of the works specified therein. The Contractor shall be entitled to receive such Certificate of Completion, or on the completion, to the satisfaction of the Engineer, of the works so specified and making good any defects so notified.

49.2 Similarly, in accordance with the procedure set out in **sub- clause (1)** of this Clause, the Contractor may request and the Engineer shall issue a Certificate of Completion in respect of :-

- a) Any section of the Permanent Works in respect of which a separate time for completion is provided in the Contract and
- b) Any substantial part of the Permanent Works which has been both completed to the satisfaction of the Engineer and occupied by the IDMC LTD/ Owner.

49.3 If any part of the Permanent Works shall have been virtually completed and shall have satisfactorily passed any final test that may be prescribed by the Contract, the Engineer may issue a Certificate of Completion in respect of that part of the Permanent Works before completion of the whole of the Works and, upon the issue of such Certificate, the Contractor shall be deemed to have undertaken to complete any outstanding work in that part of the Works during the Period of Maintenance.

49.4 Provided always that a Certificate of Completion given in respect of any section or part of the Permanent Works before completion of the whole shall not be deemed to certify completion of any ground or surfaces requiring reinstatement, unless such Certificate shall expressly so state.

MAINTENANCE AND DEFECTS (DEFECT LIABILITY)/WARRANTY

50.0 Definition of Period of Maintenance:

50.1 In these conditions the expressions the expression "Period of Maintenance" shall mean the period of maintenance named in the appendix to the tender, calculated from the date of completion of the works, certified by the engineer in accordance with the **clause 49** hereof, or, in the event of more than one certificate having been issued by the engineer under the said clause, the period of maintenance the expression the " the works" shall be constructed accordingly.

50.2 To the intent that the works shall at or as soon as practicable after the expiry of the period of maintenance be delivered to the IDMC LTD in the condition required by the contract, fair wear and tear expected, to the satisfaction of the engineer, the contractor shall finish the work, if

any, outstanding at the date of completion , as certified under the **clause 49** hereof, as soon as practicable after which date and shall execute all such work of repair, amendment, reconstruction, rectification and making good defects, imperfections, shrinkage or other faults as may be required of the Contractor in writing by the Engineer during the Period of Maintenance, or **within fifteen days** after its expiry as a result of an inspection made by or on behalf of the Engineer prior to its expiry.

50.3 All such work shall be carried out by the Contractor at his own expense if the necessity thereof shall, in the opinion of the Engineer, be due to the use of materials or workmanship not in accordance with the Contract, or to neglect or failure on the part of the Contractor to comply with any obligation, expressed or implied, on the Contractor's part under the Contract.

50.4 If the Contractor shall fail to do any such work as aforesaid required by the Engineer, the Service Recipient/ IDMC LTD shall be entitled to employ and pay other persons to carry out the same and if such work is work which in the opinion of the Engineer, the Contractor was liable to do at his own expense under the Contract, then all expenses consequent thereon or incidental thereto shall be recoverable from the Contractor by the Service Recipient/ IDMC LTD or may be deducted by the Service Recipient/ IDMC LTD from any payment due or which may become due to the Contractor.

51.0 Contractor to Search:

51.1 The Contractor shall, if required by the Engineer in writing, search under the direction of the Engineer for the cause of any defect, imperfection or fault appearing during the progress of the Works or in the Period of Maintenance. Unless such defect, imperfection or fault shall be one for which the Contractor is liable under the Contract, the cost of the work carried out by the Contractor in searching as aforesaid shall be borne by the Service Recipient/ IDMC LTD. If such defect, imperfection or fault shall be one for which the Contractor is liable as aforesaid, the cost of the work carried out in searching as aforesaid shall be borne by the Contractor and he shall in such case repair, rectify and make good such defect, imperfection or fault at his own expense in accordance with the provisions of **Clause 50** hereof.

ALTERATIONS, ADDITIONS AND OMISSIONS

52.0 Variations:

52.1 The Engineer shall make any variations of the form, quality or quantity of the Works or any part thereof that may, in his opinion, be necessary and for that purpose, or if for any other reason it shall, in his opinion be desirable, he shall have power to order the Contractor to do any of the following :-

- a) Increase or decrease the quantity of any work included in the Contract,
- b) Omit any such work,
- c) Change the character or quality or kind of any such work,
- d) Change the levels, lines, position and dimensions of any part of the Works, and
- e) Execute additional work of any kind necessary for the completion of the Works,
- f) Change any specified sequence, method or timing of construction of any part of the works,

No such variation shall in any way vitiate or invalidate the Contract, but the value, if any, of all such variations shall be taken into account in ascertaining the amount of the Contract Price.

52.2 No such variations shall be made by the Contractor without an order in writing of the Engineer. Provided that no order in writing shall be required for increase or decrease in the quantity of any work where such increase or decrease is not the result of an order given under this Clause, but is the result of the quantities exceeding or being less than those stated in the Schedule of Quantities. Provided also that if for any reason the Engineer shall consider it desirable to give any such order verbally, the Contractor shall comply with such order and any confirmation in writing of such verbal order given by the Engineer, whether before or after the carrying out of the order, shall be deemed to be an order in writing within the meaning of this clause. Provided further that if the Contractor shall within seven days confirm in writing to the Engineer and such confirmation shall not be contradicted in writing within fourteen days by the Engineer, it shall be deemed to be an order in writing by the Engineer.

53.0 Valuation of Variations:

53.1 All extra or additional work done or work omitted by order of the Engineer shall be valued at the rates and prices set out in the

Contract if, in the opinion of the Engineer, the same shall be applicable. If the Contract does not contain any rates or prices applicable to the extra or additional work, then suitable rates or prices shall be agreed upon between the Engineer and the Contractor. For settling the rates of the extra items, the contractor's cost for overheads and profits shall be taken as **15% (fifteen percent)** of the materials, labour cost etc.. In the event of disagreement the Engineer shall fix such rates or prices as shall, in his opinion, be reasonable and proper.

53.2 Provided that if the nature or amount of any omission or addition relative to the nature or amount of the whole of the Works or to any part thereof shall be such that, in the opinion of the Engineer, the rate or price contained in the Contract for any item of the Works is, by reason of such omission or addition, rendered inapplicable, then a suitable rate or price shall be agreed upon between the Engineer and the Contractor. In case of disagreement the Engineer shall work out and fix the rate or the price.

53.3 In case of any class of work for which there is not such specification supplied by the Owner/Service Recipient/IDMC LTD as is mentioned in the tender documents such work shall be carried out in accordance with Indian Standard Specifications and if the I.S.S. do not cover the same the work should be carried out as per the standard Engineering practice subject to the approval of the Engineer.

Provided also that no increase or decrease under **clause 53.1** or variation of rate or price under **clause 53.2** of shall be made unless, as soon after the date of the order as is practicable and, in the case of extra or additional work, before the commencement of the work or as soon thereafter as is practicable, notice shall have been given in writing:-

- a) By the Contractor to the Engineer of his intention to claim extra payment or a varied rate or price or
- b) By the Engineer to the Contractor of his intention to vary a rate or price.

53.4 If, on certified completion of the whole of the works, it shall be found that a reduction or increase greater than **25 (Twenty five) per cent** of the sum named in the Letter of Acceptance, results from:-

- a) The aggregate effect of all Variation Orders, and
- b) All adjustments upon measurement of the estimated quantities set out in the Schedule of Quantities,

But not from any other cause, the amount of the Contract Price shall be adjusted by such sum as may be agreed between the Contractor and the Engineer or, failing agreement, fixed by the Engineer having regard to all material and relevant factors, including the Contractor's site and general overhead costs of the Contract.

53.5 The Contractor shall send to the Engineer once in every month an account giving particulars, as full and detailed as possible, of all claims for any additional payment to which the Contractor may consider himself entitled and of all extra or additional work ordered by the Engineer which he has executed during the preceding month.

No final or interim claim for payment for any such work or expense will be considered which has not been included in such particulars. Provided always that the Engineer shall be entitled to authorise payment to be made for any such work or expense, notwithstanding the Contractor's failure to comply with this condition, if the Contractor has, at the earliest practicable opportunity, notified the Engineer in writing that he intends to make a claim for such work.

PLANT, TEMPORARY WORKS AND MATERIALS

54.0 Plant, etc., Exclusive Use for the Works:

54.1 All Constructional Plant, Temporary Works and materials provided by the Contractor shall, when brought on to the of the Works and the Contractor shall not remove the same or any part thereof, except for the purpose of moving it from one part of the site to another, without the consent, in writing, of the Engineer, which shall not be unreasonably withheld..

54.2 Upon completion of the Works the Contractor shall remove from the Site all the said Constructional Plant and Temporary Works remaining thereon and any unused materials provided by the Contractor.

54.3 The Service Recipient/ IDMC LTD shall not at any time be liable for the loss of or damage to any of the said Constructional Plant, Temporary Works or materials save as mentioned in **Clauses 20 and 66** hereof.

55.0 Approval of Materials, etc., not Implied:

55.1 The operation of **Clause 54** hereof shall not be deemed to imply any approval by the Engineer of the materials or other matters referred to

therein nor shall it prevent the rejection of any such materials at any time by the Engineer.

MEASUREMENT

56.0 Quantities:

56.1 The quantities set out in the Schedule of Quantities **for Civil & IE** are the estimated quantities of the work, but they are not to be taken as the actual and exact quantities of the Works to be executed by the Contractor in fulfilment of his obligations under the Contract.

57.0 Works to be measured:

57.1 The Engineer shall, except as otherwise stated, ascertain and determine by measurement the value in terms of the Contract of work done in accordance with the Contract. He shall, when he requires any part or parts of the Works to be measured, give notice to the Contractor's authorised agent or representative, who shall forthwith attend or send a qualified agent to assist the Engineer in making such measurement, and shall furnish all particulars required by either of them. Should the Contractor not attend, or neglect or omit to send such agent, then the measurement made by the Engineer or approved by him shall be taken to be the correct measurement of the work. For the purpose of measuring such permanent work as is to be measured by records and drawings, the Engineer shall prepare records and drawings month by month of such work and the Contractor, as and when called upon to do so in writing, shall, within fourteen days, attend to examine and agree such records and drawings with the Engineer and shall sign the same when so agreed. If the Contractor does not so attend to examine and agree such records and drawings, they shall be taken to be correct. If, after examination of such records and drawings, the Contractor does not agree the same or does not sign the same as agreed, they shall nevertheless be taken to be correct, unless the Contractor shall, within fourteen days of such examination, lodge with the Engineer, for decision by the Engineer, notice in writing of the respects in which such records and drawings are claimed by him to be incorrect.

58.0 Method of Measurement:

58.1 The Works shall be measured net, as prescribed in the specification of works, notwithstanding any general or local custom, except where otherwise specifically described or prescribed in the Contract. Wherever not specifically mentioned in the Contract, the mode of measurement as prescribed in the relevant IS codes shall be applicable and binding to the Contract. A list of **ISS code of practices**, which shall be referred to in that event, is attached as **annex to the Section**

IV of Technical Specifications. Only the latest editions of all the codes of practices including all latest official amendments and revisions shall be applicable.

58.2 For measurement of items of work in foundation and plinth & in super structure the criteria shall be the plinth level of the individual buildings covered under this Contract.

NOMINATED SUB-CONTRACTORS

59.0 Definitions of "Nominated Sub-Contractors":

59.1 All specialists, merchants, tradesmen and others executing any work or supplying any goods, materials or services, who may have been or be nominated or selected or approved by the Service Recipient/ IDMC LTD or the Engineer, and all persons to whom by virtue of the provisions of the Contract the Contractor is required to sub-let any work shall, in the execution of such work or the supply of such goods, materials or services, be deemed to be sub-Contractors employed by the Contractor and are referred to in this Contract as "nominated Sub-Contractors".

59.2 The Contractor shall not be required by the Service Recipient/ IDMC LTD or the Engineer or be deemed to be under any obligation to employ any nominated Sub-Contractor against whom the Contractor may raise reasonable objection, or who shall decline to enter into a sub-contract with the Contractor containing provisions :-

- a) That in respect of the work, goods, materials or services the subject of the sub-contract, the nominated Sub- Contractor will undertake towards the Contractor the like obligations and liabilities as are imposed on the Contractor towards the Service Recipient/ IDMC LTD by the terms of the Contract and will save harmless and indemnify the Contractor from and against the same and from all claims, proceedings, damages, costs, charges and expenses whatsoever arising out of or in connection therewith, or arising out of or in connection with any failure to perform such obligations or to fulfil such liabilities, and
- b) That the nominated Sub-Contractor will save harmless and indemnify the Contractor from and against any negligence by the nominated Sub-Contractor, his agents, workmen and servants and from and against any misuse by him or them of any Constructional Plant or Temporary Works provided by the Contractor for the purposes of the Contractor and from all claims as aforesaid.

59.3 If in any connection with any Provisional Sum the services to be provided include any matter of design or specification of any part of

the permanent works or of any equipment or plant to be incorporated therein, such requirement shall be expressly stated in the Contract and shall be included in any nominated Sub-Contract. The nominated Sub-Contract shall specify that the nominated Sub-Contractor providing such services will save harmless and indemnify the Contractor from and against the same and from all claims, proceedings, damages, costs, charges and expenses whatsoever arising out of or in connection with any failure to perform such obligations or to fulfil such liabilities.

59.4 For all work executed or goods, materials, or services supplied by any nominated Sub-Contractor, there shall be included in the Contract Price:-

- a) The actual price paid or due to be paid by the Contractor, on the direction of the Engineer, and in accordance with the Sub-Contract;
- b) The sum, if any, entered in the Schedule of Quantities for labour supplied by the Contractor in connection therewith, or if ordered by the Engineer as may be determined in accordance with **Clause 53** hereof;
- c) In respect of all other charges and profit, a sum being a percentage rate of the actual price paid or due to be paid calculated, where provision for such is made in a special item provided in the Schedule of Quantities for such purpose.

59.5 Before issuing, under **Clause 60** hereof, any certificate, which includes any payment in respect of work done or goods, materials or services supplied by any nominated Sub- Contractor, the Engineer shall be entitled to demand from the Contractor reasonable proof that all payments, less retention, included in previous certificates in respect of the work or goods, materials or services of such nominated Sub-Contractor have been paid or discharged by the Contractor, in default whereof unless the Contractor shall

- a) Inform the Engineer in writing that he has reasonable cause for withholding or refusing to make such payments and
- b) Produce to the Engineer reasonable proof that he has so informed such nominated sub-contractor in writing,

the Service Recipient/ IDMC LTD shall be entitled to pay to such nominated sub- contractor direct, upon the certificate of the Engineer, all payments, less retention, provided for in the sub-contract, which the Contractor has failed to make to such nominated sub-contractor and to deduct by way of set-off the amount so paid by the Service

Recipient/ IDMC LTD from any sums due or which may become due from the Service Recipient/ IDMC LTD to the Contractor. Provided always that, where the Engineer has certified and the Service Recipient/ IDMC LTD has paid direct as aforesaid, the Engineer shall in issuing any further certificate in favour of the Contractor deduct from the amount thereof the amount so paid, direct as aforesaid, but shall not withhold or delay the issue of the certificate itself when due to be issued under the terms of the Contract.

59.6 In the event of a nominated sub-contractor, as hereinbefore defined, having undertaken towards the Contractor in respect of the work executed, or the goods, materials or services supplied by such nominated sub-contractor, any continuing obligation extending for a period exceeding that of the Period of Maintenance under the Contract, the Contractor shall at any time, after the expiry if the Period of Maintenance, assign to the Service Recipient/ IDMC LTD, at its request and cost, the benefit of such obligation for the unexpired duration thereof.

CERTIFICATE AND PAYMENT

60.0 Interim Payment Certificate:

60.1(a) The Contractor shall submit a bill or shall submit measurement of works executed for the preparation of the bill on computer of Service Recipient/ IDMC LTD for interim payment in 3 copies to the Engineer on a specified date in each month in a form approved by the Engineer. The bill for interim payment shall include the following items, as applicable, which shall be taken in to account in the sequence listed:-

- i) The estimated Contract cost of the Permanent Works executed since the submission of the last bill, obtained by applying the base unit rates and prices in the Schedule of Quantities measured by the Engineer pursuant to **clause 57**. Additional part payment of an item in respect of initial part certification shall be admissible in the interim payment bill.
- ii) The estimated Contract cost of the Permanent Works as obtained above executed up to the previous bill;
- iii) The cumulative estimated Contract cost at base unit rates and prices of the Permanent Works up to the bill in question obtained by adding (i) and (ii) ;

- iv) The cumulative amounts approved in respect of extra items executed up to the bill in question, obtained by applying the rates approved.
- v) An amount reflecting any changes in cost pursuant to **clause 71 (Refer Clause 11.5 of Vol I Section I of this bidding document)** hereof;
- vi) Any amount to be withheld under the retention provisions of **clause 60.3;**
- vii) Any credit or debit for the period in question in respect of materials on site intended for, but not yet incorporated in , the Permanent Works in the amount and under the conditions set forth in **clause 60.2;**
- viii) Any amount to be deducted on account of the mobilisation advance under the provisions set forth in **clause 60.5.**
- ix) Any other sum to which the Contractor may be entitled under the Contract.
- x) Deductions of Income tax shall be made on the gross amount of each bill as per the provision of the Income tax Act.
- xi) Any amount to be deducted on account of water charges and power supply, if any, pursuant to **clause 5.4 & 6.2 of Section III, Special Conditions of Contract.**
- xii) Any amount to be deducted on account of materials issued to the Contractor pursuant to **clause 7.1 of section III, Special Conditions of Contract.**

60.1(b) Within a reasonable period or any other agreed period of the receipt of the said bill with all required supporting documents for interim payment, it shall be approved or amended such that, in the Engineer's opinion, the certificate reflects the amount due to the Contractor in accordance with the Contract. In cases where there is difference of opinion as to the value of any item, the Engineer's view shall prevail. IDMC shall verify the RA bills/Invoices and process the payment of each certified bill/Invoices amount as per Special conditions of the contract (SSC clause No. – 9.0)

60.2 Secured Advance for Material: Not Applicable

~~The Contractor shall be entitled to such sum as the Engineer may consider proper in respect of materials intended for but not yet incorporated in the Permanent Works provided that:~~

The materials are in accordance with the specification for the Permanent Works;

- a) ~~Such materials have been delivered to the site, and are properly stored and protected against loss or damage or deterioration to the satisfaction of the Engineer;~~
- b) ~~The Contractor's records of the requirements, orders, receipts and the use of materials are kept in a form approved by the Engineer and such records shall be available for inspection by the Engineer;~~
- c) ~~The Contractor shall submit with his running bill, the estimated value of the materials on site together with such documents as may be required by the Engineer for the purpose of the valuation of materials and providing evidence of ownership and payment therefore;~~
- d) ~~The ownership of such materials shall be deemed to vest in the Service Recipient; and~~
- e) ~~Secured advance, against an undertaking in the prescribed format can be paid upto 75% of value of the material (90% of value of the material in case of cement, Reinforcement steel & Structural steel) brought and physically available at site. The value of such secured advance shall be worked out on the basis of basic rate available in purchase order or invoice rate of building material. The lower value of the two shall be payable as secured advance against material available at site. In case basic rate of building material is not indicated/ available in the purchase order, the value of such secured advance shall be worked out on the basis of invoice rate of building material. However, such secured advance in any case, shall not exceed 75% (90% of value of the material in case of cement, Reinforcement steel & Structural steel) of cost of material component of the quoted rate for relevant tender items. No advance will be given for perishable material, like sand, window glass, wood etc. The advance on material shall be recovered as soon as material is used & billed for.~~
- f) ~~The contractor shall have to sign & give the undertaking given below for obtaining secured advance for material on site:~~

~~“Certified that the above material I/We have actually brought at the site and I/We have not previously received any advance on the same material. These materials are of imperishable nature and are actually required for use or work in connection with items for which rates for finished work have been agreed upon and agreement has been signed and executed. The above materials on which secured~~

~~advance is applied are our own property and free from encumbrances of any kind and I/We will indemnify the Board against all claims to any material in respect of which an advance has been made as aforesaid.~~

~~I/We shall made at my/our own cost all necessary and adequate arrangements for proper watch, safe custody and protection against all risks of the said materials and that until used in construction as per contract.~~

~~The said material shall remain at the site of the said work in the contractor's custody and on his own responsibility and shall at all times be open to inspection by the Board or any Officer authorised by them. In the event of the materials or any part thereof being stolen, destroyed or damaged or becoming deteriorated. I/We will forthwith replace same with other materials of like quality or repair and made good, the same as required by the Board.~~

~~It is hereby agreed and declared that notwithstanding anything in the contract agreement and without prejudice to the power contained therein if and whenever the convenient for payment and repayment herein before contained shall become enforceable and the money owing shall not be paid in accordance with the Board may at any time thereafter adopt all or any of the following courses as they may deem best:~~

- ~~a) Seize and utilize the said materials or any part thereof in the completion of the said works on behalf of the Contractor in accordance with the provisions in that behalf contained in the said agreement debiting the Contractors with the actual cost of effecting such completion and the amount due in respect of advances under these presents and crediting the Contractor with the value of work done as if he had carried it out in accordance with the said agreement and the rates thereby provided. If the balance is against the Contractor he is to pay same to the Board on demand.~~
- ~~b) Remove and sell by public auction the seized materials or any part thereof and out of the money arising from the sale retain all the sums aforesaid repayable or payable to the Board under these present and pay over the Surplus (if any) to the Contractor.~~
- ~~c) Deduct all or any part of the money owing out of the security deposit or any sum due to the Contractor under the said agreement.~~
- ~~g) The secured advance shall be paid as advance money and will be recovered/adjusted on prorata basis from the five submitted invoice.~~

Signature of the Contractor”**Retention Money: Applicable as per Special conditions of the contract (SSC clause No. – 9.0). -**

- ~~a) A retention amounting to 5.0% of the amount included in any monthly interim payment certificate pursuant to clause 60.1 due to the Contractor on account of the Permanent Works executed by him shall be made by the Engineer in the first and following certificates until such time as the cumulative total of such deductions shall amount to 5% of the total actual value of Work to be done;~~
- ~~b) If the Contractor so requests, tService Recipientee Recipient/ IDMC LTD may pay the cumulative amount of retention money to the Contractor upon lodgment with the Service Recipient/ IDMC LTD of a Bank guarantee issued by a Nationalized Indian Bank or a foreign bank having branches in India. The acceptable form of Bank guarantee shall be strictly as given in Section IX of the bidding document.~~
- ~~c) Retention money in full shall be released to the Contractor upon successful completion of works along with full and final settlement of the contract. Provided always that, if at such time there shall remain to be executed by the Contractor any works ordered during such period pursuant to clause 50 and 51 hereof, the Purchaser/Service Recipient/ IDMC LTD shall be entitled to withhold payment until the completion of such works of so much of the balance of the retention money as shall, in the opinion of the Engineer, represent the cost of the works so remaining to be executed; and~~
- ~~d) No interest shall be paid by the Purchaser/Service Recipient/ IDMC LTD to the Contractor for the amount withheld as Retention Money.~~
- ~~e) The bank guarantee (B.G.) shall be valid for the entire period of Contract plus 3 months claim period. The B.G. can be initially accepted for a period as per Banking norms, on written undertaking of contractor/ bidder that the BG shall be extended before its expiry & shall be kept valid scheduled completion period stipulated in the contract plus 3 months claim period. The validity of the bank guarantee shall be suitably extended in the event of extension of time of the Contract pursuant to clause no. 44 herein plus 3 months claim period.~~

60.4 The Engineer may by any Interim Payment Certificate make any corrections or modifications in any previous bills (other than one purporting to be a Final payment certificate) which shall have been

~~issued by him and shall have power to modify or withhold any Interim Payment Certificate if the works or any part thereof are not being carried out to his satisfaction.~~

60.5 Mobilization Advance Loan - Applicable as per Special conditions of the contract (SSC clause No. - 9.0)

- ~~a) The Service Recipient/ IDMC LTD, if requested for, will make an advance loan to the Contractor for the costs of mobilization in respect of the works in a lump sum amount equivalent to **20%** of the Order/Contract price excluding the costs of the materials to be supplied by the Owner/Service Recipient/ IDMC LTD, always provided that the value of the Contract is more than **Rs.10 lakh**. Payment of the loan will be due under separate certification by the Engineer after;~~
- ~~i) Execution of the **Form of Agreement** by the parties thereto;~~
- ~~ii) Provision by the Contractor of the Performance Security in accordance with **clause 10** hereof, and~~
- ~~iii) Provision by the Contractor of a bank guarantee equivalent to 110% of advance amount, valid till the delivery period of contract issued by a Nationalized Indian Bank or a foreign bank having branches in India. The acceptable form of Bank guarantee shall be strictly as given in **Section IX** of the bidding document. The bank guarantee shall remain effective until the advance loan has been completely repaid by the Contractor out of current earnings under the Contract and certified accordingly by the Engineer.~~
- ~~b) The acceptable form of bank guarantee shall be as given in **Section IX** of bid document. The mobilization advance loan shall be free of interest.~~
- ~~c) Recovery towards mobilization advance paid shall be made proportionately **starting from the first interim RA Bill in a manner so as to recover the entire mobilization advance by the time 80% work is completed. In case the scope/value of work is reduced the % rate of recovery shall be enhanced suitably.**~~
- ~~d) The bank guarantee (B.G.) shall be valid for the entire period of Contract **plus 3 months claim period**. The B.G. can be initially accepted for a period as per Banking norms, on written undertaking of contractor/ bidder that the BG shall be extended before its expiry & shall be kept valid scheduled completion period stipulated in the contract **plus 3 months claim period**.~~

~~The validity of the bank guarantee shall be suitably extended in the event of extension of time of the Contract pursuant to clause no. 44 herein plus 3 months claim period.~~

60.6 All interim payments shall be treated as advance payments. On completion of the entire work, the Contractor shall submit his final bill. After verifying the final bill, the Service Recipient/ IDMC LTD will issue to the Contractor a statement (hereinafter called as the Final Account statement). The Contractor shall return the Final Account Statement duly signed as an acknowledgement of full and final value of work performed under the Contract and full & final settlement of the payment. On receipt of this statement back from the Contractor, the final payment shall be released.

61.0 Approval only by Maintenance Certificate:

61.1 No certificate other than the Maintenance Certificate referred to in **Clause 62** hereof shall be deemed to constitute approval of the Works.

62.0 Maintenance Certificate:

62.1 The Contract shall not be considered as completed until a Maintenance Certificate shall have been signed by the Engineer and delivered to the Service Recipient/ IDMC LTD stating that the Works have been completed and maintained to his satisfaction. The Maintenance Certificate shall be given by the Engineer after the expiry of the Period of Maintenance, or, if different periods of maintenance shall become applicable to different sections or parts of the Works, the expiry of the latest such period, or as soon thereafter as any works ordered during such period, pursuant to **Clause 50 and 51 hereof**, shall have been completed to the satisfaction of the Engineer and full effect shall be given to this Clause, notwithstanding any previous entry on the Works or the taking possession, working or using thereof or any part thereof by the Service Recipient/ IDMC LTD/Purchaser.

62.2 The Service Recipient/ IDMC LTD shall not be liable to the Contractor for any matter or thing arising out of or in connection with the Contractor the execution of the works, unless the Contractor shall have made a claim in writing in respect thereof before the issuance of the Maintenance Certificate under this Clause.

62.3 Notwithstanding the issue of the Maintenance Certificate the Contractor and, subject to **clause 62.2**, the Service Recipient/ IDMC LTD shall remain liable for the fulfilment of any obligation incurred under

the provisions of the Contract prior to the issue of the Maintenance Certificate which remains unperformed at the time such Certificate is issued and, for the purposes of determining the nature and extent of any such obligation, the Contract shall be deemed to remain in force between the parties hereto.

REMEDIES AND POWERS

63.0 Default of Contractor:

63.1 If the Contractor shall become bankrupt, or have a receiving order made against him, or shall present his petition in execution levied on his goods, or if the Engineer shall certify in writing to the Service Recipient/ IDMC LTD that in his opinion the Contractor: -

- a) Has abandoned the Contract, or
- b) Without reasonable excuse has failed to commence the works or has suspended the progress of the works for **28 days** after receiving from the Engineer written notice to proceed, or
- c) Has failed to remove materials from the site or pull down and replace work for **30 days** after receiving from the Engineer written notice that the said materials or work had been condemned and rejected by the Engineer under these conditions, or
- d) Despite previous warnings by the Engineer, in writing, is not executing the works in accordance with the Contract, or is persistently neglecting to carry out his obligations under the Contract, or
- e) Has, to the detriment of good workmanship, or in defiance of the Engineer's instructions to the contrary, sub-let any part of the Contract.

Then the Service Recipient/ IDMC LTD may, after giving **15 day's** notice in writing to the Contractor, enter upon the site and the works and expel the Contractor there from and without thereby voiding the Contract, or releasing the Contractor from any of his obligations or liabilities under the Contract, or affecting the rights and powers conferred on the Service Recipient/ IDMC LTD or the Engineer by the Contract, and may himself complete the works or may employ any other Contractor to complete the works. The Service Recipient/ IDMC LTD or such other Contractor may use for such completion so much of the constructional plant, temporary works and materials, which have deemed to be reserved exclusively for the execution of the works, under the provisions of the Contract, as he or they may think proper, and the Service Recipient/ IDMC LTD may at any time, sell any of the said Constructional Plant, temporary works and unused materials including invocation of bank guarantees and apply the proceeds of sale in or towards the satisfaction of any sum(s) due or which may become due to him from the Contractor under the Contract .

63.2 The Engineer shall, as soon as may be practicable after any such entry and expulsion by the Service Recipient/IDMC LTD, fix and determine **ex parte**, or by or after reference to the parties, or after such investigation or enquiries as he may think fit to make or institute, and shall certify what amount, if any, had at the time of such entry and expulsion been reasonably earned by or would reasonably accrue to the Contractor in respect of work than actually done by him under the Contract and the value of any of the said unused or partially used materials, any Constructional Plant and any temporary works.

63.3 If the Service Recipient/ IDMC LTD shall enter and expel the Contractor under this clause, it shall not be liable to pay to the Contractor any money on account of the Contract until the expiry of Period of Maintenance and thereafter until the costs of execution and maintenance, damages for delay in completion, if any, and all other expenses incurred by the Service Recipient/ IDMC LTD have been ascertained and the amount thereof certified by the Engineer. The Contractor shall then be entitled to receive only such sum(s), if any, as the Engineer may certify would have been payable to him upon due completion by him after deducting the said amount. If such amount shall exceed the sum which would have been payable to the Contractor on due completion by him, then the Contractor shall, upon demand, pay to the Service Recipient/ IDMC LTD the amount of such excess and it shall be deemed a debt due by the Contractor to the Service Recipient/IDMC LTD and shall be recoverable accordingly.

63.4 In such event, the Service Recipient/ IDMC LTD shall charge **15%** overhead to cover the departmental charges and the same shall be recovered from the Contractor.

63.5 No credit shall be allowed to the Contractor in case the amount spent by the Service Recipient/ IDMC LTD for a particular item which shall be less than the amount payable as per the tender amount.

63.6 Risk cost purchase will be applicable if contractor failed to execute work as per owner's schedule and Project Authority/ IDMC Limited is forced to meet work completion through other agency/contractor/sub-contractor, immaterial whether if the liquidated damages is applied with or without expulsion/closure of contract. This will also include the supervision charges of 15% on and above risk purchase cost plus applicable GST.

64.0 Urgent Repairs:

64.1 If, by reason of any accident, or failure, or other event occurring to in or in connection with the works, or any part thereof, either during the execution of the works, or during the Period of Maintenance, any remedial or other work or repair shall, in the opinion of the Engineer,

be urgently necessary for the safety of the works and the Contractor is unable or unwilling at once to do such work or repair, the Service Recipient/ IDMC LTD may employ and pay other persons to carry out such work or repair as the Engineer may consider necessary. If the work or repair so done by the Service Recipient/ IDMC LTD is work which, in the opinion of the Engineer, the Contractor was liable to do at his own expense under the Contract, all expenses properly incurred by the Service Recipient/ IDMC LTD in so doing shall be recoverable from the Contractor by the Service Recipient/ IDMC LTD, or may become due from the Contractor. Provided always that the Engineer, as the case may be, shall, as soon after the occurrence of any such emergency as may be reasonably practicable, notify the Contractor thereof in writing.

SPECIAL RISKS

65.0 No Liability for War etc.:

65.1 Notwithstanding anything in the Contract contained:-

The Contractor shall be under no liability whatsoever whether by way of indemnity or otherwise for or in respect of destruction of or damage to the works, save to work condemned under the provisions of **Clause 39** hereof prior to the occurrence of any special risk hereinafter mentioned, or to property whether of the Service Recipient/ IDMC LTD or of third parties, or for or in respect of injury or loss of life which is the consequence of any special risk as hereinafter defined. The Service Recipient/ IDMC LTD shall indemnify and save harmless the Contractor against and from the same and against and from all claims, proceedings, damages, costs, charges and expenses whatsoever arising there out or in connection therewith.

65.2 If the works or any material on the site, or any other property of the Contractor used or intended to be used for the purposes of the works, shall sustain destruction or damage by reason of any of the said special risks the Contractor shall be entitled to payment for:-

- a) Any permanent work and for any materials so destroyed or damaged, and, as so far as may be required by the Engineer, or as may be necessary for the completion of the works, on the basis of costs plus such profit as the Engineer may certify to be reasonable
- b) Replacing or making good any such destruction or damage of the works:
- c) Replacing or making good such materials or other property of the Contractor used or intended to be used for the purposes of works.

- 65.3** Destruction, damage, injury or loss of life caused by the explosion or impact whenever and wherever occurring of any mine, bomb, shell, grenade or other projectile, missile, munitions or explosive of war, shall be deemed to be a consequence of the said special risks.
- 65.4** The Service Recipient/IDMC LTD shall repay to the Contractor any increased cost of or incidental to the execution of the work, other than such as may be attributable to the cost of reconstruction work condemned under the provisions of **Clause 39** hereof, prior to the occurrence of any special risk, which is however, attributable to or consequent on or the result of or in any way whatsoever connected with the said special risks, subject however to the provisions in this clause hereinafter contained in regard to outbreak of war, but Contractor shall as soon as any such increase of cost shall come to his knowledge forthwith notify the Engineer thereof in writing.
- 65.5** The Special Risks are unprecedented flood, earthquake or other convulsion of nature, war, hostilities (whether war be declared or not) invasion, act of foreign enemies, the nuclear and the pressure wave risk described in **clause 20** hereof, or in so far as it relates to the country in which the works are being or are to be executed or maintained, rebellion, revolution, insurrection, military or usurped power, civil work, or unless solely restricted to the employees of the Contractor or of his Sub-Contractors and arising from the conduct of the works, riot, commotion or disorder.
- 65.6** If, during the currency of the Contract, there shall be an outbreak of war, whether war is declared or not, in any part of the world which, whether financially or otherwise, materially affects the execution of the works, the Contractor shall, until and unless the Contract is terminated under the provision of this Clause, continue to use his best endeavours to complete the execution of the works. Provided always that the Service Recipient/ IDMC LTD shall be entitled at any time after such outbreak of war to terminate the Contract by giving written notice to the Contractor and, upon such notice being given, this Contract shall, except as to the rights of the parties under this clause and to the operation of **clause 65.8** hereof, terminate, but without prejudice to the right of either party in respect of any antecedent breach thereof.
- 65.7** If the Contract shall be terminated under the provisions of the last preceding sub-clause the Contractor shall, with all reasonable despatch, remove from the site all constructional plant and shall give similar facilities to his sub-Contractors to do so.
- 65.8** If the Contract shall be terminated as aforesaid, the Contractor shall be paid by the Service Recipient/ IDMC LTD, as in so far as much amount

or items shall not have already been covered by payments on account made to the Contractor, for all works executed prior to the date of termination at the rates and prices provided in the Contract and in addition:-

- a) The amounts payable in respect of any preliminary terms, so far as the works or service comprised therein has been carried out or performed, and a proper proportion as certified by the Engineer of any such items, the work or service comprise in which has been partially carried out or performed.
- b) The cost of materials or goods reasonably ordered for the works which shall have been delivered to the Contractor, or of which the Contractor is legally liable to accept delivery, such materials or goods becoming the property of the Service Recipient/ IDMC LTD upon such payments being made by him.
- c) A sum to be certified by the Engineer, being the amount of any expenditure reasonably incurred by the Contractor in the expectation of completing the whole of the works insofar as such expenditure shall not have been covered by the payments in this sub-clause before mentioned.
- d) Any additional sum payable under the provision of the **clauses 65.1, 65.2, and 65.4.**
- e) The reasonable cost of removal of construction plant under **clause 65.7** and, if required by the Contractor, return thereof to the Contractor's main plant yard in his country of registration or to any other destination, at no greater cost.
- f) The reasonable cost of repatriation of all the Contractor's staff and workmen employed in or in connection with the works at the time of such termination.

Provided always that against any payments due from the Service Recipient/ IDMC LTD under this sub-clause, the Service Recipient/ IDMC LTD shall be entitled to be credited with any outstanding balances due from the Contractor for advances in respect of constructional plant and materials and any other sums which at the date of termination were recoverable by the Service Recipient/ IDMC LTD from the Contractor under the terms of the Contract.

66.0 Payment in the Event of Frustration:

- 66.1** If a war or other circumstances outside the control of both parties, arises after the Contract is made so that either party is prevented from

fulfilling his Contractual obligation, or under the law governing the Contract, the parties are released from further performance, then the sum payable by the Service Recipient/ IDMC LTD to the Contractor in respect of the work executed shall be the same as that which would have been payable under **clause 65** hereof if the Contract had been terminated under the provisions of **clause 65** hereof.

67.0 Settlement of Disputes:

67.1 If the Contractor considers any work demanded of him to be outside the requirements of the Contract, or considers any drawings, record or ruling of the Engineer on any matter in connection with or arising out of the Contract or the carrying out of the work to be unacceptable, he shall promptly ask the Engineer in writing, for written instructions of decision. There upon the Engineer shall give his written instructions or decision within a period of **thirty days** of such request.

67.2 Upon the receipt of the written instructions or decisions the Contractor shall promptly proceed without delay to comply with such instructions or decisions.

67.3 If the Engineer fails to give his instructions or decisions in writing within a period of **thirty days** after being requested, or if the Contractor is dissatisfied with the instructions and decisions appeal to the Service Recipient/ IDMC LTD which shall afford an opportunity to the Contractor to be heard and to offer an evidence in support of his appeal. The Service Recipient/ IDMC LTD shall give a decision within a period of **thirty days** after the Contractor has given the said evidence in support of his appeal.

67.4 If the Contractor is dissatisfied with this decision, the Contractor within a period of **thirty days** from the receipt of the decision shall indicate his intention to refer the dispute to Arbitration, failing which the said decision shall be final and conclusive.

68.0 Arbitration:

In the event of any dispute in the interpretation of the terms and conditions of this order/ agreement or difference of opinion between the parties or any point in the order / contract arising out of or in connection with the agreement/ accepted order/ contract or with regard to performance of any obligation hereunder by either party, the parties hereto shall use their best efforts to settle such disputes or difference of opinion amicably by mutual negotiations. In case no agreement is reached, either party may forthwith give to the order, a notice in writing of the existence of such question, dispute or difference of opinion and the same shall be referred to the adjudication of **sole**

arbitrator to be appointed by “IDMC LTD” whose decision in the matter shall be final and binding on the parties. The arbitration proceedings shall be governed under the provisions of the **Indian Arbitration and Conciliation Act of 1996** and the rules thereunder or any statutory notification thereof for the time being in force. In the order/ contract, the venue of such arbitration shall be **Anand (Gujarat)** and courts at Anand alone shall have jurisdiction regarding any matter arising out of order/ contract.

69.0 Notices:

69.1 All certificates, notices or written orders to be given by the Service Recipient/ IDMC LTD or by the Engineer to the Contractor under the terms of the Contract shall be served by sending by post to or delivering the same to the Contractor's principal place of business, or such other address as the Contractor shall nominate for this purpose.

69.2 All notices to be given to the Service Recipient/ IDMC LTD or to the Engineer under the terms of the Contract shall be served by sending by post or delivering the same to the respective addresses nominated for that purpose.

69.3 Either party may change a nominated address to another address in the country where the works are being executed by prior written notice to the other party and the Engineer may do so by prior written notice to both parties.

70.0 Default of Service Recipient/ IDMC LTD:

70.1 In the event of the Service Recipient/ IDMC LTD:-

- a) Failing to pay to the Contractor the amount due under any certificate of the Engineer within **60 days** after the same shall have become due under the terms of the Contract, subject to any deduction that the Service Recipient/ IDMC LTD is entitled to make under the Contract, or
- b) Interfering with or obstructing or refusing any required approval to the issue of any such certificate, or
- c) Giving to the Contractor a formal notice that for any unforeseen reasons, it is impossible for Service Recipient/ IDMC LTD to meet its Contractual obligations.

The Contractor shall be entitled to terminate his employment under the Contract after giving thirty days prior written notice to the Service Recipient/ IDMC LTD, with a copy to the Engineer.

70.2 Upon the expiry of the **fourteen days** notice referred to in **clause 70.1**, the Contractor shall, notwithstanding the provisions of **clause 54.1** hereof, with all reasonable despatch, remove from the site all constructional plant brought by him thereon.

70.3 In the event of such termination the Service Recipient/ IDMC LTD shall be under the obligations to the Contractor in regard to payment as if the Contract had been terminated under the provisions of **clause 65** hereof, but, in addition to the payments specified in **clause 65.8** hereof, the Service Recipient/ IDMC LTD shall pay to the Contractor the amount of any loss or damage to the Contractor arising out of or in connection with or by consequence of such termination, as are deemed reasonable & fair.

71.0 Changes in Cost and Legislation: (Refer Clause 11.5 of Vol I Section I of this bidding document)

72.0 Taxation:

72.1 The prices quoted by the Contractor shall include all applicable Taxes (GST), levies, cess and duties that may be levied according to the laws and regulations on the constructional plant, material and supplies acquired for the purpose of the Contract and on the services performed under the Contract. Nothing in the contract shall relieve the Contractor from his responsibility to pay any tax that may be levied on profits made by him in respect of the Contract. Any variation after receipt of bids on account of change in rates of applicable Taxes, levies, cess and duties shall be considered for payment provided the price break up is submitted by the party in their bid. If, any altogether new Tax, levy, cess and duty is imposed on such contract after the bid opening date, the same shall be considered for payment / reimbursement upon documentary evidence.

GST Notification No. 20/2017 (Central Tax – Rate) dated 22 August, 2019 is not applicable for this Job.

Applicable GST for this job is @ 18%. However, the actual GST shall be paid as per the prevailing rate at the time of billing.

72.2 The Contractor's staff, personnel and labour will be liable to pay personnel income taxes in respect of such of their salaries and wages as are chargeable under the laws and regulations for the time being in force, and the Contractor thereof as may be imposed on him by such laws and regulations.

73.0 Bribery and Collusion:

73.1 The Service Recipient/IDMC LTD shall be entitled to terminate the Contract and recover from the Contractor the amount of any loss resulting from such termination if the Contractor shall have offered or given to any person any gift or consideration of any kind as an inducement or reward for doing, or for bearing to do any action in relation to obtaining, or in the execution of Contract or any other Contract with the Service Recipient/ IDMC LTD, or if any of the like acts shall have been done by any person employed by the Contractor or acting on his behalf (whether with or without the knowledge of the Contractor), or if the Contractor shall have come in to any agreement with another Contractor(s) whereby an agreed quotation or estimate shall be offered as a bid to the Service Recipient/ IDMC LTD by one or more Contractors.

73.2 In the event of such termination, the Contractor shall:

- a) Proceed as provided in sub **clause 65.7** hereof, and
- b) Be paid by the Service Recipient/IDMC LTD as provided in sub **clause 65.8** hereof, provided that any loss referred herein shall first be deducted.

74.0 Termination of Contract for Service Recipient / IDMC LTD's Convenience:

74.1 The Service Recipient/IDMC LTD shall be entitled to terminate this Contract at any time for its own convenience after giving **60 days** prior notice to the Contractor, with a copy to the Engineer.

74.2 In the event of such termination the Contractor:

- a) Shall proceed as provided in **sub clause 65.7** hereof, and
- b) Shall be paid by the Service Recipient/ IDMC LTD as provided in sub **clause 65.8** hereof.

SECTION – III

SPECIAL CONDITIONS OF CONTRACT

SECTION III
SPECIAL CONDITIONS OF CONTRACT
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Section III**SPECIAL CONDITIONS OF CONTRACT****1.0 General:**

The following Special conditions of Contract shall supplement the General conditions of Contract, given in **Section II**. Wherever there is a conflict the provision herein shall prevail over those in the General conditions of Contract.

2.0 Taxes:

2.1 The prices quoted by the Contractor shall include all applicable Taxes (GST), levies, cess and duties that may be levied according to the laws and regulations on the constructional plant, material and supplies acquired for the purpose of the Contract and on the services performed under the Contract. Nothing in the contract shall relieve the Contractor from his responsibility to pay any tax that may be levied on profits made by him in respect of the Contract. Any variation after receipt of bids on account of change in rates of applicable Taxes, levies, cess and duties shall be considered for payment provided the price break up is submitted by the party in their bid. If, any altogether new Tax, levy, cess and duty is imposed on such contract after the bid opening date, the same shall be considered for payment / reimbursement upon documentary evidence.

3.0 Time of Completion: 12 Months from the date of LOI/Purchase order and applicable as per GCC

3.1 The Contractor shall execute the Contract up to **10% increase** in the value of the works within the specified completion period of the Contract and no extension of time shall be granted. In case the increase in the value **exceeds 10%** of the Contract amount, proportionate extension of time shall be granted, for the entire amount of increase over the original Contract value.

4.0 Engineer's Office Accommodation & Project's Name Board:(Not applicable for this contract)

4.1 The Contractor shall at his own cost provide a temporary furnished office accommodation in the form of either three nos. of containers (Portable Office Cabins) each **20 sqm** (with AC) or approx. **60 Sq.m building area at the approved locations and as per approved plan** along with AC (Air Conditioner) and modern toilet facility with electrical and water connection.

Further, 4 Nos. office tables, 1 Conference table, 3 Nos. Cupboards, 12 Nos. Chairs, Colour television of 55 inch and A3 multifunctional colour printer, etc. (this includes the replacement of cartridge on time-to-time basis) shall also be provided by Contractor for IDMC LTD site officers. Contractor shall provide free electricity during the duration of contract and shall be liable for regular maintenance of the facilities. The structure shall be removed after the completion of work, by the Contractor, at his own cost. However, this requirement shall be applicable only if the estimated contract amount is more than **Rs. 100 lakhs**.

- 4.2** The contractor at his own cost shall also provide near the entrance of the project site, a suitable name board fabricated from MS sheet with support structure, duly painted and lettering, indicating the name of project, owner, turnkey consultant, architect, civil contractor and mechanical contractor etc., as per drawing and details approved by purchaser's site engineer. However, this requirement shall be applicable only if the estimated contract amount is more than **Rs. 100 lakhs**.

5.0 Water for Construction and Other Use: (Not applicable to this contract)

- 5.1** Unless otherwise specified the Contractor shall make his own arrangement for water for the work and nothing extra shall be paid for the same.

- 5.2** The water used by the Contractor shall be fit for drinking as well as construction purposes to the satisfaction of the Site Engineer/Project Authority.

- 5.3** The Contractor may be allowed to construct temporary tube well /wells in the Project site for getting water after he has got written consent of the Owner/Project Authority/Engineer. The Contractor shall be required to provide necessary arrangements to avoid any accident or damage to the buildings, roads, and service lines adjacent to the tube wells/wells sunk. The Contractor shall dismantle the tube well/well on completion of work and restore the ground to its original condition at his own cost.

- 5.4** In case the Owner/Project Authority/purchaser supplies water, it shall be on the following conditions:

- 1.** Water charges shall be recovered from each RA bill @ **0.5%** of net amount of work done of such bill.

2. The water shall be provided at one point in the site at the discretion of the Engineer. The Contractor shall make its own arrangement for water connection and distribution pipe lines in the construction area.
3. The Owner/Project Authority shall not guarantee the maintenance of uninterrupted water supply. It will be the responsibility of the Contractor to make alternative arrangements for water supply at his own cost in the event of any break down so that the progress of work is not affected for want of water. No claim or damage or refund of water charges shall be entertained on account of such break down.

6.0 Power (Electricity) Supply:

- 6.1 Unless otherwise specified the Contractor shall have to make his own arrangements for the power supply at his cost. All the electrical works shall be done as per **INDIAN ELECTRICITY RULES**. The temporary lines shall be removed by the Contractor at his cost after the completion of the work or if there is any hindrance , to the other works due to the alignment of these lines, during the Contract period.
- 6.2 In case the ELECTRIC power supply is provided by the Purchaser/Owner/project Authority, it shall be on the following conditions:-
 1. Electricity charges shall be recovered from each RA bill @ **0.5%** of net amount of work done of such bill.
 2. The supply shall be made at one point in the site at the direction of the Engineer. The Contractor shall make his own arrangement to receive, carry and distribute the power wherever it is required within the site as per **INDIAN ELECTRICITY RULES**.
 3. The Purchaser/owner / project authority shall not guarantee the maintenance of uninterrupted electricity supply and voltage fluctuations etc. It will be the responsibility of the contractor to make alternative arrangements for electricity supply at his own cost in the event of any breakdown so that the progress of work is not affected for want of electricity. No claim or damage or refund of electricity charges shall be entertained on account of the above.

4. The temporary supply lines shall be removed and the site shall be cleared by the Contractor after the completion of the work at his own cost.

**7.0 Materials to be issued by the Purchaser/Owner/Project Authority:
(Not applicable for this contract)**

- 7.1** If the specification of the work provides for the use of any material of special description to be supplied from the Purchaser/Owner/Project Authority's stores or is required that the Contractor shall use certain stores to be provided by the Engineer, such materials and stores, and price to be charged therefore, as hereinafter mentioned being as practicable for the convenience of the Contractor , but not so as in any way to control the meaning or the effect of the Contract, the Contractor shall bound to purchase and shall be supplied with such materials and stores as are from time to time required to be used by him for the purpose of the Contract only. The sum due from the Contractor for the value of materials supplied by the Project Authority/Owner **plus 5%** of its value towards wastage shall be recovered from the interim bill on the basis of the actual consumption of the materials in the works covered and for which the interim bill has been prepared. After the completion of the works, the Contractor shall account for full quantity of the material supplied to him as per relevant clauses herein.
- 7.2** The value of the materials as may be issued to the Contractor by Purchaser/Owner/Project Authority shall be debited to the Contractor's account at the rate shown in the Schedule of material given in **Section VI (Schedule of material to be issued by owner/IDMC LTD)** of this bidding document and if they are not entered in the schedule, they will be debited at cost price, which for the purpose of the Contract shall include the cost of carriage and all other expenses whatsoever such as normal storage, supervision charges which shall have been incurred in obtaining the same at the Owner/Project Authority's stores. All materials so supplied to the Contractor shall remain the absolute property of the Purchaser/Owner/ Project Authority and shall not be removed on any account from the site of work unless specifically approved by the Engineer and shall be at all times open for inspection to the Engineer. Any such serviceable material remaining unused at the time of the completion or termination of the Contract shall be returned to the Purchaser/Owner/ Project Authority stores at a place as directed by the Engineer in perfectly good condition.

7.3 Conditions for Issue of Materials:

- i) Materials specified as to be issued by the Purchaser/Owner/Project Authority will be supplied to the Contractor by the Engineer from his stores as given in the **'Schedule of material to be supplied by the Owner/ IDMC LTD in Section VI** of this bidding document. It shall be the responsibility of the Contractor to take delivery of the materials and arrange for its loading, transport and unloading at the site of works at his own cost. The material shall be issued during the working hours and as per the rules of the Purchaser/Owner/ Project Authority as framed from time to time.
- ii) The Contractor shall bear all incidental charges for the storage and safe custody of the materials at site after they have been issued to him.
- iii) Materials as specified to be issued by the Purchaser/Owner/Project Authority shall be issued in standard sizes and quantities obtained from the manufacturers.
- iv) The Contractor shall construct suitable godown wherever required at the site of works for storing the issued materials safely against damage by rain, dampness, fire, theft etc. He shall also employ necessary watch and ward establishment for the purpose.
- v) It shall be the duty of the Contractor to inspect material supplied to him at the time of taking delivery and satisfy himself that they are in good condition. After the materials have been delivered by the Purchaser/Owner/Project Authority, it shall be the responsibility of the Contractor to keep these in good condition and if the materials are lost or damaged, at any time the value thereof shall be recovered from the Contractor pursuant to **clause 7.4** hereof and **clause 5.0 of Section VI**.
- vi) The Purchaser/Owner/Project Authority shall not be liable for delay in supply or non-supply of any material which they have undertaken to supply, where such failure or delay is due to natural calamities, act of enemies, transport and procurement difficulties and any circumstances beyond the control of the Purchaser/Owner/Project Authority. In no case, the Contractor shall be entitled to claim any compensation or loss by him on this account.

vii) It shall be the responsibility of the Contractor to arrange in time all materials required for the works other than those supplied by the Purchaser/Owner/ Project Authority. If, however, in the opinion of the Engineer the execution of the works is likely to be delayed due to the Contractor's inability to make arrangements for supply of such materials which normally he has to arrange for the Engineer shall have the right at his own discretion to issue such material if available with the Purchaser/Owner/ Project Authority or procure such materials from the market or elsewhere and the Contractor will be bound to take such materials at the rates decided by the Engineer.

This, however, shall not absolve the Contractor from the responsibility of making arrangement for the supply of such materials in part or full, should such situation occur nor shall this constitute a reason for delay in the work.

viii) Unless specifically approved by the Engineer, none of the materials supplied to the Contractor shall be utilized by the Contractor for manufacturing the item which can be obtained as supplied from standard manufacturer in finished form.

ix) The Contractor shall, if desired by the Engineer, be required to execute an indemnity bond in the prescribed form, for safe custody and accounting all materials issued by the Purchaser/ Owner/Project Authority.

x) The Contractor shall furnish to the Engineer sufficiently in advance the statement showing his requirement of the quantities of the materials to be supplied by the Purchaser/Owner/Project Authority and the time when the same will be required by him for the works, so as to enable the Engineer to make necessary arrangement for procurement and supply of the material.

xi) A day account of the materials issued by the owner shall be maintained by the Contractor indicating the daily receipt, consumption and balance in hand. This account shall be maintained in a manner prescribed by the Engineer along with all connected paper viz. requisition, issues etc. and shall be always available for in the Contractor's office at site.

- xii) The Contractor should see that only the required quantity of the materials is issued. The Contractor shall not be entitled to cartage and incidental charges for returning the surplus materials, if any, to the store wherefrom they were issued or to the place as directed by the Engineer.
- xiii) Materials/equipment supplied by the purchaser/Owner / Project Authority shall not be utilised for any other purpose other than issued for.
- xiv) Completion of the works and the receipt of unutilised materials issued to the Contractor by the Owner/Project Authority/Purchaser pursuant to **clause 7.3** herein. The Contractor shall submit the reconciliation statement of materials received, utilised in the works and wastage thereon. The wastage of materials so determined shall be accounted for pursuant to **clause 5.0 of Section VI**, and the value thereof shall be recovered from the Contractor.
- 7.4** Notwithstanding anything contained to the contrary in any or all clauses of this Contract where any materials for the execution of the Contract are procured with the assistance of the Owner/ Project Authority/ Purchaser either by issue from Owner' stock or purchase made under orders, or permits or licenses issued by the Govt., the Contractor shall hold the said materials as trustee for the owner and use such materials economically and solely for the purpose of the Contract and not dispose them off without the permission of the Owner/ Project Authority/ Purchaser and return, if required by the Engineer, all surplus or unserviceable materials that may be left with him after the completion of the Contract or at its termination for any reason whatsoever on his being paid or credited such price as Engineer shall determine having due regard to the condition of the materials. The price allowed to the Contractor, however, shall not exceed the amount charged to him excluding the storage charges, if any, shall be decided by the Engineer. In the event of the breach of the aforesaid condition, the Contractor shall, in terms of the licenses or permits and /or for criminal breach of trust, be liable to compensate the Owner/ Project Authority/ Purchaser at double the item rate or at double the prevailing market rate if the material was issued free of charge or any higher rate in the event of those materials at that time having higher rate or not being available in the market, than any other rate to be determined by the Engineer.

8.0 Price Basis/Incoterms – FOR IDMC Site , Purabi Dairy Guwahati Assam

8.1 The Transit insurance to be taken by the supplier shall be in an amount equal to 110% of the FOR-destination value of the goods from “warehouse to warehouse “on all risks basis including ITCA, ICCA, SRCC and war risk valid for a period not less than three months after the date of arrival of goods at destination.

8.2 For Installation and commissioning job, storage- cum – installation all risk insurance policy for an amount equal to contract value inclusive of 10% escalation valid for period not less than three months after installation, including three months for testing and commissioning shall be obtained by the supplier as per governing rules and regulations of Indian government.

8.3 Third party insurance – Before commissioning the installation work the supplier without limiting his obligations and responsibilities, shall insure against his liability for any material or physical damage, loss or injury which may occur to any property including that of the Owner/IDMC, or to any person including any employee of the Owner/IDMC. Such Insurance shall be for an amount not less than 10% of the contract value.

8.4 Transportation of the Goods up to the site including its insurance till delivery at the site shall be the responsibility of the Bidder and the cost thereof shall be included in the bid price.

9. Payment terms:

9.1 Payment terms for Supply of Goods

- a) 20% as advance of contract value against submission of equivalent security in the form of Bank guarantee from a Nationalize bank with banker confirmation (SFMS) and shall valid till receipt of all equipment as per contract to IDMC Site (Guwahati, Assam) in acceptable condition.
- b) 60% of contract value shall be payable in 30 days from the date of safe receipt of all equipment at site in acceptable condition.
- c) 10% of contract value shall be payable against successful erection and Installation of all equipment and duly certified by IDMC engineer/consultant.
- d) 10% of the contract value on successful commissioning and final acceptance of the plant and fulfilment of all contractual obligation and accepted by the IDMC engineer/consultant and against submission of equivalent amount of performance bank guarantee valid till defect liability/warranty period (12 months) from the date of handing over and acceptance of the plant.

9.2 Payment terms for Installation, testing and commissioning

- a) 90% of the contract value for installation and commissioning shall be paid on prorated basis on actual completion of installation/erection and billed for and after due inspection and approval by the purchaser (against detailed break up cost to be furnished by the Supplier in advance and accepted by the Purchaser).
- b) 10% of the contract value on successful commissioning and final acceptance of the plant and fulfilment of all contractual obligation and accepted by the IDMC engineer/consultant and against submission of equivalent amount of performance bank guarantee valid till defect liability/warranty period (12 months) from the date of handing over and acceptance of the plant.

9.3 Payment terms for Spares, CTO approval & Operation & Maintenance

- a) 30 days after receipt of Invoice duly certified by IDMC engineer/consultant

10.0 Warranty :

The Supplier warrants that the Goods and equipment, supplied, installed, and commissioned under the Contract are new, unused, of the most recent or current models and incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Supplier further warrants that the Goods supplied under this Contract shall have no defect arising from design, materials or workmanship (except insofar as the design or material is required by the Purchaser's Specifications) or from any act or omission of the Supplier, that may develop under normal use of the supplied Goods in the conditions obtaining in the country of final destination. The Supplier also guarantees that the Goods supplied shall perform satisfactorily as per the signed/rated/-installed capacity as provided for in the Contract.

The warranty period is 12 months after the date of successful commissioning acceptance, and completion certificate duly signed by both parties or handover of the machine. The automation systems, instruments, and controls will be guaranteed against system malfunction for a period of 12 months from the date of commissioning. Bidder to inform the terms and conditions for extended warranty for 1 year + 2 year after completion of warranty period.

The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty.

Upon receipt of such notice, the Supplier shall promptly respond and resolve the issue maximum within 7 days from the date of notice by way of repair or replace the defective Goods or parts thereof, without costs to the Purchaser.

If the Supplier, having been notified, fails to remedy the defect(s) within a reasonable period mentioned above, the Purchaser may proceed to take such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

11.0 Storage of Building Materials and Construction Equipment:

11.1 The contractor shall make suitable arrangement at project site for storage of all the construction material and construction equipment being supplied by him. Suitable watch and ward arrangement shall be made by the contractor. This arrangement has to be done by the contractor at his own cost.

11.2 The Pre-painted sheet roofing shall be stacked strictly as per manufacturers' guideline and stored in a covered shed.

11.3 The fabrication yard for MS sections shall have a levelled pucca floor, and should be maintained dust free at all times. The structural sections shall be stacked & stored orderly so as to avoid initial warping of the sections.

12.0 Rate of Progress - Contractor's Schedule:

The schedule prepared by the Contractor shall be based on the normal day of eight hours of working plus a break of one hour. All Sundays and local holidays should be considered as the day of rest. The schedule shall thus be prepared considering above working conditions. The contractor shall plan the resources adequately to meet the schedule date of completion.

13.0 Mode (Drawings/specifications) of Execution:

The bid drawings/tender drawings displayed/presented for inspection are liable to changes and the work shall be executed as per construction/execution drawings & details released for execution in accordance with technical specifications & schedule of quantities.- The items not covered under technical specifications, if any, shall be executed as per latest applicable BIS code of practice.

13.1 Quality Control Engineer :

13.1.1 The Contractor shall at his own cost deploy a dedicated and full time qualified quality control engineer (Electrical / Mechanical works) at site throughout the entire duration of the contract. The engineer shall be a B.Tech (Electrical/Mechanical) with minimum 5 years of experience OR a Diploma (Electrical/Mechanical) with minimum 7 years of experience specifically in the field of quality assurance and control of similar type of civil works. The quality engineer should be conversant with relevant IS codes, material testing procedures, record keeping/documentation, in-situ testing, quality conformance of bought out materials & quality of workmanship in various construction activities at project site. The CV & experience certificates of the quality engineer are to be submitted along with the bid document.

Non deployment, delay in deployment and /or withdrawal of quality engineer from project site without prior written permission of IDMC LTD Engineer in charge shall invite permanent deduction of Rs. 80,000/- (Rupees Eighty thousand) per month from the running bills. Thereafter, IDMC LTD will be selecting the quality control engineer to be appointed by the contractor on their rolls for the entire duration of their contract with IDMC LTD. Nothing extra shall be paid by IDMC LTD on this account.

Above conditions at clause no. 13.1.1 is generally applicable for steel structure and electrical works contract value of Rs. 5.0 Crore and above.

13.2 Instructions for billing:**13.2.1 Minimum Billing Requirement: (Not applicable)**

At any point during the currency of the contract, the minimum bill submitted by the contractor shall be 4.0 Crore (basic amount) plus applicable GST.

13.2.2 Billing Plan:

The contractor shall submit a detailed billing plan prior to the commencement of work. The billing plan must outline the contractor's expected monthly billing amounts and ensure that the work is completed as per the agreed commitment/timeline.

13.2.3 Adherence to Billing Plan:

The contractor is obligated to adhere strictly to the billing plan submitted. Any deviation from the agreed plan, resulting in non-compliance with the minimum billing amount, shall be treated as a breach of contract.

13.2.4 Non-Compliance and Consequences:

In case the contractor fails to meet the minimum billing requirement as specified above, the Engineer-In-Charge reserves the right to reject the contractor's bill without any further explanation or correspondence. Additionally, the contractor may be subject to penalties or other actions deemed appropriate as per the terms of the contract.

13.2.5 Enforcement:

The Engineer-In-Charge has the authority to monitor the contractor's billing progress and ensure compliance with the billing plan and minimum billing requirements throughout the contract duration.

13.3 Instruction for Local Liaisoning and statutory compliance

13.3.1 Local Liaisoning:

The contractor shall be required to ensure that all works and activities undertaken under this contract comply with local regulations, norms, and any specific instructions related to local governance. The contractor must maintain regular communication with the local authorities, if applicable, and ensure that all required permits and approvals are obtained in a timely manner for the smooth execution of the work.

13.3.2 Statutory Compliance:

The contractor shall comply with all applicable laws, statutes, rules, regulations, and orders issued by government authorities, including but not limited to labor laws, environmental regulations, tax laws, safety standards, and any other legal requirements that may be relevant to the performance of the contract. The cost for same shall be included in the quoted rate by the contractor. The contractor is responsible for ensuring that all statutory obligations, including but not limited to:

- Registration with local labor authorities
- Registration with BOCW and applicable fees/Cess to be considered. Any invoices/JMS submitted for payment must accompany the details of payment made toward labour Cess.
- Payment of applicable taxes, duties, and levies
- Compliance with health and safety standards
- Environmental compliance requirements
- Any other statutory or regulatory compliance specific to the nature of the work being undertaken are strictly adhered to throughout the duration of the contract.
- Timely compliance related to GST submission to be ensured before submission of bills.

13.3.3 Indemnification for Non-Compliance:

The contractor shall indemnify and hold harmless the employer from any loss, damage, or penalty that may arise due to the contractor's failure to comply with local regulations or statutory requirements during the execution of the contract.

13.3.4 Documentation and Reporting:

The contractor shall maintain records of all statutory filings, permits, and compliance reports and shall make these available for inspection by the employer or relevant authorities upon request. The contractor shall provide periodic updates on the status of statutory compliance as may be required by the employer.

13.3.5 Failure to Comply:

In case of non-compliance with any local regulations or statutory requirements, the employer reserves the right to take corrective actions, including but not limited to withholding payment, imposing penalties, or terminating the contract, as deemed appropriate.

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SECTION – IV

TECHNICAL SPECIFICATIONS (ETP WORKS)

**SECTION IV
TECHNICAL SPECIFICATIONS
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Technical Specification		

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<p style="text-align: center;">TECHNICAL SPECIFICATION</p> <p style="text-align: center;">SECTION 11.0 WATER SUPPLY</p> <p>11.01 Providing & Laying under ground GI pipe line for 80 mm dia.</p> <p>The pipes shall be galvanized mild steel welded pipes and screwed and socketed tubes conforming to the requirements of IS: 1239-1982, for medium grade. They shall be of the diameter (nominal bore {NB}) specified in the description of the item. The sockets shall be designated for the respective nominal bores of the pipes for which they are intended. The pipes and sockets shall be cleanly finished well galvanized in and out and free from cracks surface flaws, laminations, and other defects. All screwed threads shall be clean and well cut. The ends shall be cut cleanly and square with the axis of the tube.</p> <p>All screwed tubes and 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.</p> <p>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 and male threads (except on running nipples and collars of unions) shall be taper.</p> <p>The pipes and 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 re-threaded, 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 and 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 and 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 and fitting shall be protected from damage until they are fitted.</p>		
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The pipes shall be cleaned of all foreign matter before being laid in jointing the pipes, the inside of the socket and 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. Burr 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:

Diameter of pipe	Width of trench	Depth of trench
15 mm to 50mm	30 cm	60 cm
65 mm to 100mm	45 cm	75 cm

At joints the trench width shall be widened where necessary. The work of excavation and refilling shall be done true to line and gradient in accordance with general specifications for each work in trenches. After successful pressure testing, the pipe line to be painted a coat of APCOMIN ROZC primer PQ 1741, 25 micron DFT followed by two coats of Bituminous paint of approved make OR pipes shall be wrapped with thermo-fusible composite film 4 mm thick made out of fibre glass mat base with polymeric coatings (like PYKOTE) of approved make, as per the procedure recommended by the manufacturer **as specified in schedule of quantities**. The pipes shall be laid on a layer of 7.5 cm sand and 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

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<p>blocks of cement concrete 1:2:4 (1 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.</p> <p>TEST:</p> <p>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.</p> <p>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. High thrust blocks of CC 1:2:4, if provided shall be paid under relevant concrete item.</p> <p>Mode of Measurement: GI pipes with fittings completely fixed in position shall be measured and paid for the finished centre line lengths and the measurement shall be in Running Meter.</p> <p>11.02 Providing & laying under ground GI pipe line for 50mm dia underground</p> <p>The general specification is same as per Item spec. no. 11.01.</p> <p>Mode of Measurement: Same as per Item spec. no.11.01</p> <p>11.03 Providing & Laying GI pipe 40 mm dia under ground</p> <p>The general specification is same as per Item spec. no. 11.01.</p> <p>Mode of Measurement: Same as per Item spec. no.11.01</p>		
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<p>11.04 Providing & laying 25mm dia GI pipe under ground</p> <p>The general specification is same as per Item spec. no. 11.01.</p> <p>Mode of Measurement: Same as per Item spec. no.11.01</p> <p>11.05 Providing & Laying GI pipe 20mm dia under ground</p> <p>The general specification is same as per Item spec. no. 11.01.</p> <p>Mode of Measurement: Same as per Item spec. no.11.01</p> <p>11.06 Providing & Laying GI pipe 15 mm dia under ground</p> <p>The general specification is same as per Item spec. no. 11.01.</p> <p>Mode of Measurement: Same as per Item spec. no.11.01</p> <p>11.07 Providing & Laying open GI pipe line 80 mm dia</p> <p>For open line work the galvanised iron pipes and fittings shall run on the surface of the walls or ceiling (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.</p> <p>All pipes and fittings shall be fixed truly vertical and horizontal unless unavoidable the pipes shall be fixed to walls with standard pattern holders bat clamps made out of MS flat carrier fixed with bolts in the RCC or brick masonry and “C” clamp fixed to secure the pipe with GI bolts / screws / washers of required shape and size so as to fit tightly on the pipes when tightened with screwed bolts. The clams shall be painted with two coats of enamel paint over a coat of anti-corrosive primer. 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.</p>		
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<p>The rate shall include providing and laying the pipe line with all necessary specials in open, properly fixing it with clamps and testing the line all complete including necessary scaffolding.</p> <p>Mode of Measurement: GI pipes with fittings completely fixed in position shall be measured and paid for the finished centre line lengths and the measurement shall be in Running Meter.</p> <p>11.08 Providing & Laying open GI pipe line 50mm dia</p> <p>The general specification is same as per Item spec. no. 11.07</p> <p>Mode of Measurement: Same as per Item spec. no.11.07</p> <p>11.09 Providing & Laying open GI pipe line 40 mm dia</p> <p>The general specification is same as per Item spec. no. 11.07</p> <p>Mode of Measurement: Same as per Item spec. no.11.07</p> <p>11.10 Providing & Laying open GI pipe line 25mm dia</p> <p>The general specification is same as per Item spec. no. 11.07</p> <p>Mode of Measurement: Same as per Item spec. no.11.07</p> <p>11.11 Providing & Laying open GI pipe line 20mm dia</p> <p>The general specification is same as per Item spec. no. 11.07</p> <p>Mode of Measurement: Same as per Item spec. no.11.07</p> <p>11.12 Providing & Laying open GI pipe line 15 mm dia</p> <p>The general specification is same as per Item spec. no. 11.07</p> <p>Mode of Measurement: Same as per Item spec. no.11.07</p> <p>11.13 Providing & Laying concealed in structure GI pipe line 80 mm dia</p>		
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<p>For internal work the pipes shall be concealed in the brick masonry / RCC. Chasses or zarries shall be cut in the walls and the pipes shall be laid. The pipes laid in the zarries (recess /grooves) shall be secured in position by approved arrangement like duly painted MS holding hook 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 of appropriate diameter GI pipe shall be fixed at a place where a pipe is passing through a wall or floor for inception of the pipe and to allow freedom for expansion movements and contraction and other. All the embedded pipe lines in walls or floors to be painted with anti-corrosive bituminastic 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. The rate shall include making zarries in the wall, cutting floor, making holes, painting the pipe line with anticorrosive bituminastic paint all complete.</p> <p>Mode of Measurement: GI pipes with fittings laid properly shall be measured along the centre line lengths and the measurement shall be in Running Meter.</p> <p>11.14 Providing & Laying concealed in structure GI pipe line 50mm dia</p> <p>The general specification is same as per Item spec. no. 11.13</p> <p>Mode of Measurement: Same as per Item spec. no.11.13</p> <p>11.15 Providing & Laying concealed in structure GI pipe line 40 mm dia</p> <p>The general specification is same as per Item spec. no. 11.13</p> <p>Mode of Measurement: Same as per Item spec. no.11.13</p> <p>11.16 Providing & Laying concealed in structure GI pipe line 25mm dia</p> <p>The general specification is same as per Item spec. no. 11.13</p>		
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<p>Mode of Measurement: Same as per Item spec. no.11.13</p> <p>11.17 Providing & Laying concealed in structure GI pipe line 20mm dia</p> <p>The general specification same as per Item spec. no. 11.13 Mode of Measurement: Same as per Item spec. no.11.13</p> <p>11.18 Providing & Laying concealed in structure GI pipe line 15 mm dia</p> <p>The general specification is same as per Item spec. no. 11.13</p> <p>Mode of Measurement: Same as per Item spec. no.11.13</p> <p>11.19(a) CPVC pipes work</p> <p>For internal work and external work only where specified CPVC pipes tubes conforming to Specific Gravity ASTM D 792 at 23oC should be 1.55 as specified. With Tensile Strength as per ASTM D 638 at 23oC should be 55N/mm2.</p> <p>All special fittings and accessories like internally or externally threaded brass adaptors, ball valves, globe valves, unions, diaphragm valves, butterfly valves, etc. shall be made of CPVC by licensee.</p> <p>The CPVC solvent cement used for installing CPVC piping systems shall conform to ASTM F493. Pipes from 15 mm up to 50 mm pipes and fittings, single step medium bodied CPVC solvent cement should be used. For CPVC pipes and fittings upwards of 50 mm, a primer shall be used followed by heavy bodied solvent cement conforming to ASTM F493. PVC solvent cement should not be used.</p> <p>Concealed Plumbing:</p> <p>All internal concealed plumbing for water supply shall be done with CPVC pipes. The pipes & fittings shall conform to CTS (Copper Tube Size) SDR-11 as per ASTM D2846 OR SDR-13.5. All pipes and fittings from 15 mm up to 50 mm shall come under this category. Medium body CPVC solvent cement conforming to ASTM F493 should be used for joining pipes to fittings.</p>		
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External Plumbing:

The CPVC pipes above 50 mm for external water supply lines shall conform to ASTM F441 CPVC Schedule 40 & 80 pipe and will be the CPVC brand. The fittings above 50 mm size shall conform to ASTM F438 for Schedule 40 CPVC fittings and ASTM F 439 for Schedule 80 CPVC fittings. All threaded CPVC fittings shall conform to ASTM F437 (threaded CPVC fittings schedule). Heavy bodied CPVC solvent cement shall be used along with a primer. IPS brand primer and heavy bodied CPVC solvent cement only should be used conforming to ASTM F493. All external CPVC pipes shall be coated with water based acrylic paint emulsion for enhanced UV protection.

Installation procedure:

All parameters pertaining to the installation of CPVC plumbing system such as cutting, joining, support spacing, expansion loops, insulation, type of support, special connections, etc. shall be as per the manufacturer's specifications.

All pipes shall be fixed in accordance with layout and alignment shown on the drawings. Care shall be taken to avoid air pockets.

Trenches:

All water supply pipes below ground shall be laid in trenches with a minimum cover of 60 cms. The width and depth of the trenches shall be as follows:-

Dia. of pipe	Width of trench	Depth of trench
15 mm to 50 mm	30 cms	75 cms
65 mm to 100 mm	45 cms	100 cms

Pipe Insulation for Hot Water Pipes:

Hot Water Pipes fixed in wall chase shall be insulated by using 9mm thick rubberised insulation sleeve of material shall be closed cell Elastomeric Nitrile Rubber or closed cell cross linked polyethylene foam.

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<p>Thermal conductivity of elastomeric nitrile rubber shall not exceed 0.038 W/m OK or 0.0313 K.Cal/M.hr OC at an average temperature of 30°C. Density of the material shall not be less than 0.06 gm/cm³.</p> <p>Testing:</p> <p>After laying and jointing, the pipes and fittings shall be inspected under working condition of pressure and flow. Any joint found leaking shall be redone and all leaking pipes removed and replaced without extra cost. Use of any compound or stop leak compound will not be permitted.</p> <p>The pipes and fittings after they are laid shall be tested to hydraulic pressure of 1.5 times the working pressure or 7.5 Kg/Sq.cm whichever is more. The pipes shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock or water hammer. The draw of taps and stop cocks shall then be closed and specified hydraulic pressure shall be applied gradually.</p> <p>Pressure gauge must be accurate and preferably should have been recalibrated before the test. The test pump having been stopped, the test pressure should be maintained without loss for at least two hours. The pipes and fittings shall be tested in sections as the work of laying proceeds, having the joints exposed for inspection during the testing.</p> <p>Measurements: - The Specification same as Item No. 11.01.</p> <p>11.19(b) UPVC pipes Work</p> <p>Providing and fixing open UPVC threaded pipes (schedule 80 / 40 as specified in BOQ) of approved make, complete, including making airtight joints, with necessary specials, couplers, elbow, equal tees, tail piece, adapter (both male and female), reducer (single stage, double stage and triple stage), end cap, fabricated bend, etc., in proper line and level including necessary support like clamps, brackets to wall, ceiling and floor, approved quality, and lubricant or jointing material, including testing, cutting, making good the wall, ceiling and floor etc,</p> <p>Materials:</p> <p>The threaded pipe (schedule 80 / 40 as specified in BOQ) of specified diameter</p>		
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<p>with working pressure shall conform to ASTM-D-1785. The specials and fittings required shall be of best quality and UV stabilized so as to facilitate open fixation, conforming to IS: 4985 or ASTM D-2467 schedule 80 and relevant specifications of plumbing materials.</p> <p>Workmanship:</p> <ol style="list-style-type: none"> 1. The UPVC pipes of specified diameter shall be fixed as directed. Due to thermal expansion of UPVC pipes due allowances about of 10 mm of thermal gap shall be made particularly in case of over the ground pipe lines for any change in length of pipe line which may occur during installation or when pipe line is in serve stress developing from thermal expansion. 2. Generally, in horizontal runs, UPVC pipes shall be supported at an interval of not more than ten times the outside diameter of the pipe. In vertical lines, UPVC pipes shall be supported at an interval of 1 m. to a maximum of 2 m. Closer support spacing shall be provided, if approved by the manufacture. 3. The guide line indicated by the manufacture regarding handling, transporting, storage, laying and jointing of pipes shall be kept in view during execution. Provision for expansion joints, air vents and proper anchorage shall be made. UPVC pipes shall be fixed on wall with wooden plugs and suitable clamps. <p>Jointing the pipes</p> <ol style="list-style-type: none"> 1. The pipes and sockets shall be accurately cut. Care shall be taken to cut the pipe square. The shortened pipe end shall be chamfered to an angle of 15⁰ with a medium file. The ends of the pipes and fittings should be absolutely free from dirt and dust. The outside surface of the pipes and the inside of the fittings shall then be roughened with emery paper and then solvent cement shall be applied to the matching surface i.e. , to the spigot end and the sealing ring and then push the spigot end in to the socket containing the sealing ring until pushed home fully and joined. Mark the position of the socket edge on the pipe and then withdraw the pipe from the socket for the necessary thermal gap. Since solvent cement is aggressive to UPVC, care must be taken to avoid applying excessive cement to the inside of pipe sockets as any surplus cement cannot be wiped off after jointing. Very old, hard, dense solvent cement shall not be used. Empty solvent cement tins, brushes, rags of paper impregnated with cement should not be buried in the trenches. They should be gathered, not left scattered about, as they can prove to be a hazard to animals, which may chew them. 2. Threaded UPVC pipe-fittings shall not be over tightened, as the threads may get damaged. The pipes shall never be threaded but suitable threaded fittings shall be used. 		
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3. If any manufacturer recommends its own methods of jointing, the same shall be adopted after necessary approval from the Engineer-in-charge.

Laying the pipes in trench:

The pipes shall be laid over uniform relatively soft fine-grained soil, found to be free from presence of hard objects such as large flints, rocky projections, large tree roots, etc., While laying the pipes underground, care shall be taken so that the trench shall be as narrow as possible as required for working and its bottom shall be free of stones, sharp objects etc.

The pipes laid underground shall not be less than 1 meter from the ground level. The pipe shall be positioned in the trenches so as to avoid any induced stresses due to deflection. Any deviation required shall be obtained by using proper type of rubber ring joints.

Mode of Measurements and payment: - The Specifications same as Item No. 11.01.

11.20 Full way lever operated forged brass ball valve

The ball valve shall be of Brass or Gunmetal as specified conforming to IS: 1703. The ball valve shall be as given below:

High Pressure:

High pressure is indicated by the abbreviation 'HP' for use on mains having pressure. These shall remain closed at a test pressure of 10.5 Kg/Sq.cm.

	Nominal Size of Ball Valve					
Dia. of spherical float (mm)						
High Pressure	127	152	203	229	254	305
Low Pressure	114	127	178	203	203	254
Minimum weight of ball valve including back nut, body and piston (gms)	283	446	823	1149	1589	1852

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<p>The ball valves shall be of following nominal sizes 15mm, 20mm, 25mm, 32mm, 40mm, 50mm and 80 mm. The nominal size shall correspond with the nominal bore of the inlet shanks.</p> <p>Mode of Measurement: All valves shall be measured by numbers.</p> <p>11.21 Providing and fixing Sluice valve for 40mm dia pipe line</p> <p>The general specification is same as per Item spec. no. 11.19</p> <p>Mode of Measurement: Same as per Item spec. no.11.19</p> <p>11.22 Providing and fixing Sluice valve for 25mm dia pipe line</p> <p>The general specification is same as per Item spec. no. 11.19</p> <p>Mode of Measurement: Same as per Item spec. no.11.19</p> <p>11.23 Providing and fixing Sluice valve for 20mm dia pipe line</p> <p>The general specification is same as per Item spec. no. 11.19</p> <p>Mode of Measurement: Same as per Item spec. no.11.19</p> <p>11.24 Providing and fixing Sluice valve for 15 mm dia pipe line</p> <p>The general specification is same as per Item spec. no. 11.19</p> <p>Mode of Measurement: Same as per Item spec. no.11.19</p> <p>11.25 Providing and fixing of Gunmetal Wheel valve of approved quality for 80 mm dia pipe line</p> <p>Providing and fixing 80 mm diameter Wheel valve of approved make confirming to relevant IS etc complete as directed by Engineer.</p> <p>Mode of Measurement: This shall be measured in Number.</p>		
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<p>11.26 Providing and fixing of Wheel valve of approved quality for 50mm dia pipe line</p> <p>The general specification is same as per Item spec. no. 11.25</p> <p>Mode of Measurement: Same as per Item spec. no.11.25</p> <p>11.27 Providing and fixing of Wheel valve of approved quality for 40mm dia pipe line</p> <p>The general specification is same as per Item spec. no. 11.25</p> <p>Mode of Measurement: Same as per Item spec. no.11.25</p> <p>11.28 Providing and fixing of Wheel valve of approved quality for 25mm dia pipe line</p> <p>The general specification is same as per Item spec. no. 11.25</p> <p>Mode of Measurement: Same as per Item spec. no.11.25</p> <p>11.29 Providing and fixing of Wheel valve of approved quality for 20mm dia pipe line</p> <p>The general specification is same as per Item spec. no. 11.25</p> <p>Mode of Measurement: Same as per Item spec. no.11.25</p> <p>11.30 Providing and fixing of Wheel valve of approved quality for 15mm dia pipe line</p> <p>The general specification is same as per Item spec. no. 11.25</p> <p>Mode of Measurement: Same as per Item spec. no.11.25</p> <p>11.31 Providing & Fixing Bib cock for 15mm dia pipe line</p> <p>A bibcock (foam flow) is a draw off tap with horizontal inlet and free outlet .It shall of brass chromium plated (CP) the finish obtained electrolytically by applying layer of chromium so as to improve the appearance, enhance surface hardness, heavy duty of specified size</p>		
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<p>and approved make & type and 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 catch type securely fixed to the spindle. The cocks shall open in anti-clockwise direction. The bib cocks shall 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, and roughness and shall not be stained or discoloured. A suitable matching CP brass flange is included in this item. A sample of each kind of fittings shall be got approved from the Engineer and all supplies made according to the approved sample.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.32 Providing & fixing long body bib cock</p> <p>The general specification is same as per Item spec. no. 11.31. but for providing and fixing the bib cock with long body which is generally provided for the kitchen sink or similar utilities.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.33 Providing & Fixing stop cock for 15mm dia. pipeline</p> <p>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 heavy duty made of Brass chromium plated of an approved make, specified size and 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 catch type securely fixed to the spindle. Valve shall be of the loose letter seated pattern. The cocks shall open in anti-clockwise direction. 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 and shall not be stained or discoloured. A sample of each kind of fittings</p>		
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<p>shall be got approved from the Engineer and all supplies made according to the approved sample.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.33(a) C.P. brass pillar cock</p> <p>Materials:</p> <p>15mm dia CP brass screw down shall conform to IS: 781, as per relevant specification of plumbing materials. The bib-tap shall be of 1st quality.</p> <p>Workmanship:</p> <p>The screw down bib-tap of 15mm dia as specified above shall be fixed as directed. The threaded portion shall be smeared with white or red lead and provided with a few turns of fine spun yarn round the screwed end of the pipe or the joint shall be done with a Teflon tape. The bib-tap shall be then screwed and fixed water tight.</p> <p>Mode of Measurements and Payment:</p> <p>The rate shall be for a unit of one number and include cost of all labour, materials, tools and plant, etc., required for satisfactory completion of this item.</p> <p>11.34 Providing & Fixing stop cock for 20mm dia pipe line</p> <p>The general specification is same as per Item spec. no. 11.33.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.35 Providing & Fixing Angle valve</p> <p>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</p>		
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<p>supplies made according to the approved samples. All cast fitting shall be sound and free from lumps pot holes and pittings, 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 surfaces 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 fully examined and cleared of all foreign matter before being fixed. 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. The rate shall include providing and fixing of angle valve with the flange (disc) all complete.</p> <p>Mode of Measurement</p> <p>This shall be measured in Number.</p> <p>11.36 Providing & Fixing shower rose</p> <p>CP Brass heavy duty overhead shower of approved make and model confirming to approved sample with CP brass 190 mm matching arm with wall flange . The Shower shall be pressure adjusted shower with revolving joint or single flow shower as specified in the item specification etc complete as directed by the Engineer</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.37 Providing & fixing 25mm dia GI hydrant for gardening</p> <p>The work shall be carried out as per the drawing and as directed. It shall be provided with a wheel valve and a vertical piece of GI pipe to keep the hydrant above dressed ground level or at a height as directed by the Engineer. The scope of work includes excavation, making connection with main GI pipeline, GI specials as required, connecting pipe, spout of appropriate GI pipe etc complete as directed by the Engineer.</p>		
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<p>In case a brick chamber is necessary same shall be of size 450x450 mm and depth 230 to 500 mm to suit the site conditions. The bottom of the chamber shall be finished with PCC 1:4:8 100 mm thick and the walls shall be finished with 12 mm thick plaster in CM 1:4. with a MS cover for the chamber however the chamber shall be measured under relevant tender items and shall be paid for. Nothing extra shall be paid over and above item rates for the construction of chamber if required to be provided. 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, as specified above.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.38 Providing & fixing 6mm thick asbestos or other equivalent non asbestos string for 25mm dia line</p> <p>This shall be wound closely and uniformly wound over the GI pipe line to open/ concealed in structure. Sample of asbestos string shall be got approved from the Engineer before use.</p> <p>Mode of Measurement: This shall be measured in Running Meter of the pipe treated as above.</p> <p>11.39 Providing & fixing 6mm thick asbestos or other equivalent non asbestos string for 15mm dia line</p> <p>The general specification is same per as Item spec. no.11.38</p> <p>Mode of Measurement: Same as per Item spec. no. 11.38</p> <p>11.40 Providing & Fixing Towel rail</p> <p>This shall be heavy duty brass chromium plated or as specified, of approved make. The length shall be 610 mm and the rod shall be of 20mm dia cover cup / disc. It shall be fixed with brass screws on each end, firmly securing the towel rail firmly, as directed by the Engineer. Sample of the towel rail needs to be got approved by the Engineer.</p> <p>Mode of Measurement: This shall be measured in Number.</p>		
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<p>11.41 Providing & Fixing CI manhole cover of 40 kg</p> <p>This shall be of approved make and conforming to relevant IS specification. The cover shall be provided over CI frame. The frame shall be properly grouted in the brickwork / RCC cover slab of the chambers.</p> <p>Mode of Measurement: Manhole cover with frame (as one unit) shall be measured in Number.</p> <p>11.42 Providing & Fixing Ball cock for 40mm dia pipe</p> <p>This shall be of approved class and make. This may be of brass or PVC as specified in the item with arm and the ball to be fixed in the incoming water supply line. The cock shall withstand the pressure and shall be fixed directly on the water line as directed by the Engineer.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.43 Providing & fixing ball cock for 25mm dia pipe The general specification is same as per Item spec. no.11.42 Mode of Measurement: Same as per Item spec. no. 11.42</p> <p>11.44 Providing & Fixing Ball cock for 15mm dia pipe The general specification is same as per Item spec. no.11.42 Mode of Measurement: Same as per Item spec. no. 11.42</p> <p>11.45 Providing & Fixing CP brass water spout 15mm dia</p> <p>This shall be provided and fixed at places as directed by the Engineer. The part of brickwork around the spout shall be finished to match the external finish. No patch shall be seen. The spout shall be of approved quality and make.</p> <p>Mode of Measurement: This shall be measured in Number.</p>		
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<p>11.46 Providing & Fixing GI ‘B’ class water spouts of 80mm dia</p> <p>The spout shall be 200 to 450 mm in length as directed by the Engineer. One end of the pipe shall be cut diagonally and 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. The rate shall be quoted for providing and fixing water spout in RCC or brick work as specified above.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.47 P&F GI water spout of 50mm dia</p> <p>The general specification is same as per Item spec. no.11.46</p> <p>Mode of Measurement: Same as per Item spec. no. 11.46</p> <p>11.48 P&F GI water spout of 40mm dia</p> <p>The general specification is same as per Item spec. no.11.46</p> <p>Mode of Measurement: Same as per Item spec. no. 11.46</p> <p>11.49 P&F GI water spout of 25mm dia</p> <p>The general specification is same as per Item spec. no.11.46</p> <p>Mode of Measurement: Same as per Item spec. no. 11.46</p> <p>11.50 Fixing of Geyser</p> <p>The Geyser shall be shifted from the Site stores to the required place. Supply and fixing the geyser with necessary anchor bolts with nuts, washer, CP brass angle valves, CP brass copper pipes and installation of the standard accessories supplied by the geyser supplier etc complete as directed by the Engineer. The rate shall be quoted for fixing Geyser including angle valve and chromium plated copper pipe as specified above</p>		
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<p>Mode of Measurement: This shall be measured in Number</p> <p>11.51 Fixing of Water coolers</p> <p>The Water cooler shall be shifted from the Site stores to the required place. Then necessary coach/anchor bolts with nuts, CP brass pipes and CP brass angle valves for inlet and GI outlet pipe of 25mm dia up to drain point shall be provided and fixed. The rate shall be quoted for fixing of Water cooler and other accessories supplied by the manufacturer as specified above.</p> <p>Mode of Measurement: This shall be measured in Number</p> <p>11.52 Fixing HDPE/ PVC water tank- 2000 Ltr. capacity</p> <p>To take delivery of the tank / shifting from the site stores to the place of installation as directed by the Engineer. All accessories supplied by shall be fitted to the tank and the tank shall be properly installed over the Pedestals / base constructed for installation as directed by the Engineer. (Construction of the pedestals / base shall be carried out and same shall be measured and paid under relevant tender item. Nothing extra shall be paid for the construction of pedestals / base. The rate shall be quoted for fixing water tank as specified above.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.53 Fixing HDPE/PVC Water Tank- 1000 Ltr. capacity</p> <p>The general specification is same as per Item spec. no. 11.52.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.54 Fixing HDPE/PVC Water Tank- 500 Ltr. capacity</p> <p>The general specification is same as per Item spec. no. 11.52.</p> <p>Mode of Measurement: This shall be measured in Number</p> <p>11.55 Providing and fixing Valves of various diameters complete</p>		
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<p>General - Brass or gunmetal valves shall be heavy quality, of approved manufacturer & pattern and with screwed or flanged ends as specified. The valves shall in all respects comply with IS.778-1984 & IS.781-1984. The standard size of brass or gunmetal valves shall be designated by the nominal bore of the pipe outlet to which they are to be connected. A sample of each kind of valve shall be got approved from the Project Manager & all supplies made according to the approved samples.</p> <p>All cast valves shall be round & free from blow holes. Both internal & external surfaces shall be clean, smooth & free from sand etc. Burning, plugging, stopping or patching of the casting shall not be permissible. The bonnet, spindles & other parts shall be truly machined so that when assembled the parts shall be axial, parallel & cylindrical with surface smoothly finished. The area of the water way of the valve shall not be less than the area of nominal bore.</p> <p>The valve shall be thoroughly examined & cleaned of all foreign matter before being fixed. The valves shall be fixed in the line in a workmanlike manner. The joints between fittings & pipes shall be made leak proof When Tested as described in paragraph 5.12 & the defective fittings & joints shall be replaced or redone.</p> <p>Mode of Measurement It shall be measured in numbers</p> <p>11.56 Providing and fixing insulation to small pipes embedded in walls, with 9 mm thick Nitrile rubber tube , on cPVC pipe lines for hot water supply, etc. complete, as directed of</p> <ol style="list-style-type: none"> 1) 150 mm. n.b. 2) 100 mm. n.b. 3) 80 mm. n.b. 4) 65 mm. n.b. 5) 50 mm. n.b. 6) 40 mm. n.b. 7) 32 mm. n.b. 8) 25 mm. n.b. 9) 20 mm. n.b. 10) 15 mm. n.b. 		
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<p>Materials: The insulation shall be provided as under 9 mm. thick Nitrile rubber tube. The insulation shall be fire inhibiting 9 mm. thick Nitrile rubber tube, Highly – flexible closed - cell insulation material high vapour diffusion resistance and Low thermal conductivity value of not more than 0.035 w/(m . k), FM Approved. It shall be fire inhibited (TF quality) and solvent resistant and shall be of close cellular structure and hence of negligible vapour permeability.</p> <p>Workmanship: Application: The pipe surface shall be thoroughly cleaned with a wire brush to remove all rust and other foreign matter. The cleaned surface shall be applied with a coat of industrial bitumen 85/40 or 85/25. The insulation slab shall then be stuck over this with staggered joints. The joints shall be sealed with a vapour barrier of Bitumen. The insulation shall be held in position with 1 mm. G.I. wire at 600 mm. C/C. A coat of bitumen shall then be applied over the insulated surface. Finish: The insulated surface shall be cladded all around with 24 gauge aluminium sheet.</p> <p>Mode of Measurement It shall be measured in installed running meter; The Cost shall including installation of Insulation.</p> <p>11.57 Providing and fixing, testing & commissioning of health faucet with regulator</p> <p>The general specification as specified in the item description in the schedule of quantity.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.58 Providing & Fixing C.P. brass exposed type flush valve for Urinal Pressmatic</p>		
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<p>It shall be Flush Valve of CP Brass construction of approved make as specified complete with elbow set with provision of setting and operating lever. Chromium plating shall be confirming to relevant specification. .</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.59 Providing and Fixing, testing & commissioning of Concealed type flush valve."</p> <p>The general specification as specified in the item description in the schedule of quantity.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.60 Providing and fixing Recessed type Stainless Steel soap dish</p> <p>The general specification as specified in the item description in the schedule of quantity.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.61 Providing and fixing ABS plastic body liquid soap dispenser</p> <p>Providing and fixing liquid soap holder with soap bottle of approved make such as fixed with CP brass screws etc. complete as directed.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.62 Providing & fixing stainless steel toilet paper holder</p> <p>The general specification as specified in the item description in the schedule of quantity.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>11.63 Providing & Fixing HDPE pipe</p> <p>Providing & Fixing HDPE pipe of diameter as specified in SOQ 4 kg pressure 4984 PE 80 with welding, all fitting such as bend, tee, reducer etc complete.</p>		
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<p>Mode of Measurement: This shall be measured in running meter.</p> <p>FOR THE SPECIFICATIONS AND MODE OF MEASUREMENT OF ALL OTHER ITEMS, PLEASE REFER THE SCHEDULE OF QUANTITY SINCE THEY ARE SELF EXPLAINATORY.</p>		
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TECHNICAL SPECIFICATION**12.00 SANITARY WORKS****12.01 Providing & laying various 300 mm diameter (internal diameter) non-pressure Hume pipes class NP2 (100001173)**

The pipe shall be with reinforcement as required and of the class as specified. These shall conform to IS: 458. The reinforced cement concrete pipes shall be manufactured by centrifugal (or spun) 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 mixing or moulding. The unreinforced pipes (non 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 reinforced concrete pipes and collars shall not be leaner than Grade M20. The maximum 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 and longitudinal reinforcements shall be adequate to withstand the specified hydrostatic pressure and 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:

<u>Pipe thickness</u>	<u>Spun pipe</u>	<u>Pipe other than Spun pipe</u>
	mm	mm
Less than 30 mm	9	12
30 mm to 75 mm	12	18
75 mm and over	18	18

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 pipes have spigot and socket joints, the socket ends shall face upstream. 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 part cement: 5 part coarse sand: 10 part graded stone aggregate 40mm 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 diameter 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 safely 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 equalising 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

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<p>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.</p> <p>Jointing of the pipes shall be done as described below:</p> <p>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.</p> <p>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. The open ends of the pipes during execution shall be plugged with suitable gunny gags to ensure that the surrounding earth do not enter the pipes.</p> <p>The RCC Hume pipe lines provided for road cross over for rain water, electrical/ telephone or communication cables shall be provided with suitable chambers as per details which shall be paid under relevant tender item.</p> <p>Providing and laying of pipe links, rounding off the bed to fit the lower part of the pipe, jointing of pipes all is inclusive in this item. The concrete bed and blocks of CC M20 provided at junction shall also be included in this item.</p> <p>Mode of Measurement: This shall be measured in Running Meter</p> <p>12.02 Providing & Laying 230 mm diameter non-pressure Hume pipe class NP2 (100001174)</p> <p>The general specifications shall be same as per Item spec. no. 12.01.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.01</p>		
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12.03 Providing & Laying 150mm dia non-pressure Hume pipe class NP2. (100001175)

The general specifications shall be same as per Item spec. no. 12.01.

Mode of Measurement: same as per Item spec. no. 12.01

12.03 a Providing & Laying 250 mm dia non-pressure Hume pipe class NP2. (100024078)

The general specifications shall be same as per Item spec. no. 12.01.

Mode of Measurement: same as per Item spec. no. 12.01

12.04 Providing & laying stoneware pipe of 300mm dia (internal dia)

All pipes with spigot and socket ends shall conform to IS 651 and shall be of **grade 'A'**. These shall be sound free from visible defects such as fire cracks or hair cracks. The pipes shall have uniform glazing on both inside and outside surface and shall be free from crazing or any other defect. The pipes shall give 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.

Internal diameter of the pipe	Thickness barrel and socket	Weight of each pipe per M
mm	mm	Kg
100	12	14
150	16	22
200	17	33
230	19	42
250	20	52
300	25	79
350	30	100
400	35	128
450	38	147

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/ brickbat 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 rate shall be inclusive of necessary earth work in excavation for the trench. 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 all-round 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 centre 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 part cement: 5 part coarse sand : 10 part 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 levelling 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 1:1 (1 part cement: 1 part 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 remainder of the socket shall be filled with stiff mixture of cement mortar in the proportion of 1:1 (1 part cement : 1 part fine sand) when the socket is filled, a fillet shall be formed round the joint with a trowel forming 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 newly 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 and 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 and 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 for 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. The trenches shall be back with due care and uniform compaction and surplus earth shall be disposed within site.

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.

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<p>Providing and 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, excavation and back filling etc all are inclusive in this item.</p> <p>The concrete provided for hunching shall be paid under the respective concrete item.</p> <p>Mode of Measurement: This shall be measured in Running Meter</p> <p>12.05 Providing & Laying Stoneware pipe of 230 mm dia</p> <p>The general specifications shall be same as per Item spec. no. 12.04.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.04</p> <p>12.06 Providing & laying Stoneware pipe of 150mm dia</p> <p>The general specifications shall be same as per Item spec. no. 12.04.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.04</p> <p>12.07 Providing & laying stoneware pipe of 100mm dia</p> <p>The general specifications shall be same as per Item spec. no. 12.04.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.04</p> <p>12.08 Providing & Laying CI Waste Water line concealed in structure 150mm dia with cement joint</p> <p>All cast iron pipes and fittings shall be of approved ISI make, shall be of uniform thickness with strong and deep sockets, free from flaws, air holes, cracks, hand holes and other defects and non-form to IS:1729. The pipes and fittings shall be true to shape smooth and cylindrical and shall ring clearly when struck over with a light hand hammer. All pipes and fittings shall be properly cleaned of all foreign material before being fixed.</p> <p>The annular space between the socket and spigot shall be filled with a gasket of hemp or spun yarn soaked in neat cement slurry. The joint shall then be filled with stiff cement mortar 1:2 (1 part cement: 2 part fine sand) well pressed with caulking tool and finished smooth on top at</p>		
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<p>an angle of 45 Deg. The joint shall be kept wet for not less than 7 days by tying a piece of gunny bag and kept moist. Joints shall be perfectly air and water tight.</p> <p>The thickness of fittings and their socket and spigot dimensions shall conform to the thickness and dimensions specified for the corresponding sizes of straight pipes.</p> <p>The connection between the main pipe and branch pipes shall be made by using branches and bends with access doors for cleaning. Floor traps shall be provided with 25mm dia puff pipe where the length of the waste is more than 1800mm or the floor trap is connected to a waste stack through bends.</p> <p>All cast iron pipes and fittings including joints shall be tested by a smoke test to the satisfaction of the Engineer and left in working order after completion. The smoke test shall be carried out as stated under:-</p> <p>Smoke shall be pumped into the pipe at the lowest end from a smoke machine, which consists of a bellow and burner. The material usually burnt is fresh cotton waste which gives out a clear pungent smoke which is easily detectable sight as well as by smell if it is leaking at any point of the pipeline.</p> <p>Water test and air test shall be conducted as stipulated in IS: 5329.</p> <p>The rate includes the cost of providing and laying of CI pipe, with all fittings such as branches and plug bends, fencing the holding clamps with 1:2:4 CC blocks on to the walls, cement joint in 1:2 (1 part cement: 2 part fine sand) painting with two coats of bitumastic paint and testing the pipe line.</p> <p>Mode of Measurement: CI pipes shall be measured along with centrelines of pipes in Running Meter.</p> <p>12.09 Providing & Laying CI waste water line concealed in structure 100 mm dia with cement joint</p> <p>The general specifications shall be same as per Item spec. no. 12.08.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.08</p>		
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<p>12.10 Providing & Laying CI waste water line concealed in structure 75 mm dia with cement joint</p> <p>The general specifications shall be same as per Item spec. no. 12.08.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.08</p> <p>12.11 Providing & Laying CI waste water line open with cement joint 75mm dia</p> <p>The general specification of the pipes shall be as per item 12.08.</p> <p>Pipes shall be fixed to the wall by GI or MS holder hack clamps, unless projection ears with fixing holes are vertical or to the lines and slopes as indicated. The clamps shall be fixed to the walls by embedding their hooks in cement concrete blocks (1:2:4) 10x10 cm by making necessary holes in the walls at proper places. All holes and breakages shall be made good. The clamps shall be kept 25mm clear of the finished face of the walls to facilitate cleaning and painting of pipes. CI pipes and fittings which are exposed shall be first cleaned and then painted with two coats of bitumastic paint.</p> <p>The pipe shall be tested as specified in item 12.08.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.08.</p> <p>12.12 Providing & Laying CI waste water line open with cement joint 100mm dia</p> <p>The general specifications shall be same as per Item spec. no. 12.11.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.08</p> <p>12.13 Providing & Laying CI soil pipe line 100mm dia with cement joint.</p> <p>The general specifications for the CI pipe shall be as per item 12.08.</p> <p>All plug points of drainage pipes shall be provided with inspection and cleaning caps, covers which shall be fixed with nuts and screws.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.08.</p> <p>12.14 Providing & Laying CI soil pipe line 150mm dia cement joint.</p>		
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<p>The general specification shall be same as per Item spec. no.12.13.</p> <p>Mode of Measurement : Same as per Item spec. no. 12.08.</p> <p>12.15 Providing & Laying CI soil pipe 100mm dia with lead joint</p> <p>CI pipes with socket and spigot ends shall be provided with lead caulked joints wherever specified and the joints shall conform to the requirements of IS: 3114.</p> <p>The general specifications shall be same as per item 12.13.</p> <p>Mode of Measurement: This shall be measured along the centre line of pipe line in Running Meter.</p> <p>12.16 Providing & Laying CI soil pipe 150mm dia with lead joint</p> <p>The general specification shall be same as per Item spec. no.12.15.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.15</p> <p>12.17 Providing & Laying CI soil pipe 100mm dia with cement joint inopen</p> <p>The general specifications shall be same as items 12.11 & 12.13.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.15</p> <p>12.18 Providing & Laying CI soil pipe 150mm dia with cement joint inopen</p> <p>The general specifications shall be same as item 12.17.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.15.</p> <p>12.19 [AX ITEM NO. 100021367] Providing & Laying open uPVC rain water line 75mm dia</p> <p>The strength of the pipe shall vary from 4kg/sq.cm to 10 kg/Sq.cm as specified in schedule of quantities. 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. The rate shall include providing</p>		
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<p>and fixing over clamps made out of MS flat fixed with GI bolts with the wall / RCC member and firmly securing with bat clamps with GI nuts and washer including painting with two coats of enamel paint over a coat of anticorrosive primer.</p> <p>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</p> <p>Mode of Measurement: This shall be measured in Running Metre.</p> <p>12.20 [AX ITEM NO. 100001192] Providing & Laying open uPVC rain water line 100mm dia</p> <p>The general specifications shall be same as item 12.19</p> <p>Mode of Measurement: Same as per Item spec. no. 12.19</p> <p>12.21 Providing & Laying open uPVC rain water line 150mm dia (100001193)</p> <p>The general specifications shall be same as item 12.19.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.19</p> <p>12.21a Providing & Laying open uPVC rain water line 200mm dia (100025603)</p> <p>The general specifications shall be same as item 12.19.</p> <p>Mode of Measurement: Same as per Item spec. no. 12.19</p> <p>12.22 Providing & Laying CI 100mm dia RW line concealed in the structure</p> <p>It should be of approved ISI make. It shall be free from pin holes and defects and be neatly finished from out side and inside, painted with two coats of bituministic paint. The joints of the pipes shall be filled with spurn yarn soaked with cement slurry & then finish with CM 1:2 (1 part cement, 2 part coarse sand). All necessary bends, plug bends, elbow gratings, shoe, fixing with holder bat clamps shall be provided. Pipe</p>		
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shall be cut to required lengths if the site condition demands so. The weights of the pipes of 1.83m long shall be as follows:-

Description	75mmdia	100mmdia	150mmdia
Plain single socket pipe	14 Kg/no	19 kg/no	34.5 kg/no
Plain double socket	15	20	37.20
Eared single socket pipe	14.50	19.50	35.40
Eared double socket pipe	15.40	20.40	38.00
Plain short pieces	8.20 kg/m	10.40kg/ m	19.00 kg/m
Plain bends	3.20 kg/no	4.50kg/no	9.10 kg/no
Offsets 55 mm projection	2.70	5.00	8.20
75 mm projection	3.20	5.50	9.10
115 mm projection	4.10	5.90	9.50
225 mm projection	5.00	7.30	11.80
300 mm projection	6.00	8.60	12.70
Branches single Y	5.00	7.30	14.50
Branches double Y	6.80	10.00	19.10
Plain shoe	3.20	4.10	8.60
Head	6.40	6.80	11.30
For erosion fitting	0.90	0.90	1.35
For inspection door	1.80	1.90	2.25

This item shall include all bends, collars etc.& the unit rate shall include providing and fixing of CI pipes, jointing, cutting of pipes wherever necessary, painting with bituministic paint, curing of joints

Mode of Measurement: This shall be measured in Running Meter.

12.23 Providing & Laying CI 150mm dia rain water line concealed in the structure

The general specifications shall be same as item 12.22.

Mode of Measurement: Same as per Item spec. no. 12.22

12.24 Providing & Laying CI 100 mm dia rain water line in open

The general specifications shall be same as item 12.22 but in open.

Mode of Measurement: Same as per Item spec. no. 12.22.

12.25 Providing & Laying CI 150mm dia rain water line in open

The general specifications shall be same as item 12.22 but in open.

Mode of Measurement: Same as per Item spec. no. 12.22

12.26 Providing & fixing marble pardi

It shall be of single piece of marble of approved quality and type and size as specified in the item description. The edges shall be machine cut to the required shape. Both the sides shall be well polished. The pardi shall be properly embedded in the wall with CC 1:2:4 (minimum 7.5 cm should be embedded).

Mode of Measurement: This shall be measured in SqM including embedded portion in wall.

12.27 Providing & Fixing European WC (100001197)

Water closets shall be either of white glazed earthenware, white glazed vitreous china or white glazed fire clay as specified and shall be of "Wash down type". The closets shall be of one piece construction. Each water closet shall have 4 holes having a minimum diameter of 6.5 mm for fixing to floor and 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. The water closet shall have a weep hole at the flushing inlet. Each water closet shall have an integral trap with either 'S' or 'P' outlet with at least 50mm water seal. Where required the water closets shall have an anti siphonage 50mm dia vent horn on the outset side of the trap. The inside surface of water closets and traps shall be uniform and smooth in order to enable an efficient flush. The narrated part of the outlet shall not be glazed externally. The water closet when sealed at the bottom of the trap in line with the back plate, shall be capable of holding not less than 10 litres of water between the normal water level

and the highest possible water level of the water closet as installed. The rate shall include for a heavy duty plastic seat and cover as approved by the Engineer.

Mode of Measurement: It shall be measured in Number

12.28 Providing & Fixing Orissa pan WC (100001198)

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 and the surface shall be uniform and smooth to enable easy and 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.

The rate shall include the providing and fixing of the footrests also.

Mode of Measurement: This shall be measured in Number.

12.29 Providing & fixing lipped urinal(100001199)

Urinals basins shall be large 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 vitreous china or white glazed fire clay, and of size as specified. The urinals 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 and 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 and 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 and 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 and pipe of suitable dia shall be provided. 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 numbers and paid for separately.

Mode of Measurement: This shall be measured in Number.

12.30 Providing & Fixing Wash basin (100021363)

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 and sizes indicated against each type:

<u>Types</u>	<u>Size</u>
Flat back	630x450 mm
Flat back	550x400 mm
Flat back counter top with Anti splash rim	530x430 mm

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 and 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 bevelled 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 5mm high and 305mm 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 soap 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 so as to facilitate cleaning of the overflow. The specifications for waste plug, chain and stay shall be the same as given for sinks.

All the waste fittings shall be chromium plates 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.

The rate shall be quoted for providing and fixing wash basin as specified above.

Mode of Measurement: This shall be measured in Number.

12.31 [AX ITEM NO. 100001202]

Providing & fixing kitchen sinks

The sinks shall be of white glazed earthenware, white glazed vitreous china or white glazed fire clay as specified and shall be of the following sizes:-

450x300x150 mm

610x460x225 mm

They shall be of one piece construction including a combined overflow; the floor of the sink shall gently slope towards the outlet. The outlet shall in all cases be suitable for waste fittings having flanges of 64mm diameter and the waste hole shall have a minimum diameter of 65mm at the bottom to suit the waste fittings. The waste hole shall be either rebated or bevelled having a depth of 10 mm. Each sink shall be provided with a non-ferrous 40 mm dia waste fitting. The sink shall have overflow of the waste type and the inverts shall be 30 mm below the top edge. Each sink shall be provided with a waste plug of suitable dia. chain and stay. The plug shall be of rubber or other equally suitable material and shall be water-tight when fitted plug chains shall be of brass wire of 1.80mm with brazed oval links approximately 13 mm in length and shall be chromium plated.

It shall have an overall length from the collar to the stay of not less than 300 mm. There shall be a triangular or D shackle at each end, one of which shall be brazed to the plug and the other securely fixed to the stay. The 150mm long shank of the waste shall be threaded conforming to the requirements for IS: 2556 for sinks only. The waste fittings and plug fittings shall be chromium plated. The chromium plating shall be of grade B type conforming to IS: 1068.

Mode of Measurement : This shall be measured in Number.

12.32 Providing & Fixing Stainless Steel sink with drain board

It shall be of approved make. It shall be provided with fittings and specials like 63 mm diameter waste coupling, rubber plug with heavy duty plastic grating, overflow, CP brass chain, CI brackets 40mm dia GI B class waste pipe. The waste pipe and the brackets shall be painted with two coats of synthetic enamel paint over a coat of anti corrosive primer.

Mode of Measurement: This shall be measured in Number

12.33 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. The unit rate shall include all works necessary for the item as specified above

Mode of Measurement: This shall be measured in Number.

12.34 Providing & fixing flushing cisterns

- a) The flushing cisterns shall be automatic or manually operated high level or low level, as specified. For water closets and urinals high level cistern is intended to operate with minimum height of 125 cm and a low level cistern with a maximum height of 30 cm between the top of the pan and the underside of the cistern. They shall comply with the requirement of IS: 774 for flushing type and IS: 2326 for automatic flushing cistern and IS: 7231 for plastic cistern.
- b) Cisterns shall be of vitreous china, pressed steel and plastic. The body thickness including cover shall be not less than 6 mm. The body of pressed steel cistern shall be of seamless or welded construction, of thickness not less than 1.6 mm before coating, and shall be porcelain enamelled or otherwise protected against corrosion by an equally efficient coating. The cistern shall be free from manufacturing faults and other defects affecting their utility. All working parts shall be designed to operate smoothly and efficiently. Cisterns shall be mosquito proof a cistern shall be considered mosquito proof only if there is no clearance any where which would permit a 1.6 mm wire to pass

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<p>through in the permanent position of the cistern i.e. in the flushing position or filling position.</p> <p>c) The breadth of a low level cistern, from front to back, shall be such that the cover or seat, or both of water closet pan shall come to rest in a stable position when raised. The cistern shall be supported on two cast iron or mild steel brackets of size as approved by the Engineer. These shall be properly protected by suitable impervious paint. Alternative the cisterns shall have two holes in the back, set above the overflow level, for screwing into the wall, supplemented by two cast iron or mild steel wall supports. A 5 litre cistern, however, may be supported by lugs or brackets cast on the body of the cistern.</p> <p>d) Manually operated cisterns shall be of the curved Siphon type and shall conform to the specifications given in IS 2526. The cistern shall have a removable cover which shall fit closely on it and be secured against displacement. In designs where the operating mechanism is attached to the cover, this may be made in two sections, but the section supporting the mechanism shall be securely bolted or screwed to the body.</p> <p>e) The outlet fitting of each cistern shall be securely connected to the cistern. In case of high level cisterns, the outlet shall be of 32mm nominal bore and in the case of low level cisterns, the outlet shall be of 40 mm nominal bore. Ball cock shall be of screwed type 15 mm in diameter and shall conform to IS No.1703. Ball valves (Horizontal plunger type) including. Floats for water supply purposes. In the case of high level manually operated cistern, the level arm of the cistern shall have a suitable hole near the end through which a split ring of a (S) hook shall pass. A chain shall be attached to the ring or hook.</p> <p>f) The chain shall be GI and strong enough to sustain a suddenly applied pull of 10 KG or a dead load of 50 kg without any apparent or permanent deformation of the shape of the link. The chain shall terminate in a suitable handle of 'Pull' which shall be of pottery, galvanised iron non-ferrous metal, or a moulding in any heat resisting and non-absorbent plastic. The finish shall be smooth and free from burrs. In case of low level flushing cisterns, the handle shall be chromium plated.</p> <p>g) The discharge rate of the cistern shall be about 5 ltrs in 2 seconds when connected to an appropriate flush pipe, and there shall be no</p>		
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<p>appreciable change in the force of flush during the period of discharge. The cistern shall have a discharge capacity of 5, 10 or 12.5 litres as specified.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>12.35 Providing & Fixing Automatic Flush valve(100001126)</p> <p>It shall be automatic Flush Valve of CP Brass construction of approved make as specified complete with elbow set with provision of setting and operating lever. Chromium plating shall be confirming to relevant specification. .</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>12.36 Providing & Fixing HCI Nahani trap (100006755)</p> <p>The trap shall be with or without inlet rim (as per requirement) painted with anticorrosive paint and fixed in position with PCC 1:2:4(1 cement, 2 sand, 4 graded coarse aggregate of nominal size 20mm and down) The brass CP jali shall be placed over the trap. The flooring around the trap shall be properly finished. (The trap at intermediate location shall have a rim for receiving inlet pipe)</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>12.37 Providing & Fixing CP brass bottle trap (100001207)</p> <p>It shall be of heavy duty cup type CP brass approved quality and make with a ease of cleaning by un screwing the cup. The bottle trap shall be fixed with waste coupling and the waste pipe provided under relevant item of wash basin / urinal etc..</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>12.38 Providing & fixing paper holder (100001253)</p> <p>It shall be of approved quality. It shall be glazed white vitreous china recessed type. It shall have a wooden roller or aluminium or a specified and a roll of paper.</p> <p>Mode of Measurement: This shall be measured in Number.</p>		
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12.39 Providing & Constructing Manholes of inside size 1.2 Mx1.2 M x 1.5 to 2.0 M depth. (100001209)

Manholes of different types and sizes as specified shall be constructed in the sewer line at such places and to such levels and dimensions as shown in the drawings or as directed by the Engineer. The size indicates 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 part cement: 4 part sand: 8 part 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 part cement: 6 part 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 surface and out side of chamber up to 300 mm below top on all sides with 12mm thick cement plaster 1:4 (1 part cement : 4 part sand) finished smooth with a floating coat of neat cement the balance out side surface to be pointed with cement mortar CM 1:2..

Channels and benching shall be in cement concrete 1:2:4 (1 part cement : 2 part sand : 4 part graded stone aggregate)The depth of channels and benching shall be as indicated in the table given below:

Size of drain in mm	Top of channel at the centre above bed concrete in cm	Depth of benching at side walls above bed concrete in cm
100	15	20
150	20	30
200	25	35
250	30	40
300	35	45
350	40	50
400	45	55
450	50	60

All manholes deeper 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 M 15. The block with CI foot rest placed in its centre shall be cast-in-situ along with the masonry and the surface finished with 12 mm thick cement plaster 1:4 (1 part cement: 4 part sand) finished smooth. Foot rests shall be fixed 30 cm apart vertically and staggered laterally and shall project 10 cm beyond the surface of the wall. The top foot rest shall be 45 cm 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 and frames shall conform to IS: 1726. The covers and frames shall be cleanly cast and they shall be free from air and sand holes and 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 and closing it shall be fitted in the frame in workmanship like manner. The cover shall be gas tight and water tight. Covers and 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 58 kg for frame and 58 kg for cover unless other wise mentioned in the item description.

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 centimetres.

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 $\frac{2}{3}$ 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.

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<p>Acid/alkali proof ceramic tiles/Mandana lining on the benching/internal walls up to desired height shall be provided as per the details / instructions which will be measured and paid for in the relevant tender item.</p> <p>The frame of the manhole cover shall be firmly embedded to correct alignment and levels in 150 mm thick RCC 1:2:4 (1 part cement : 2 part sand : 4 part graded stone aggregate) on top of the brick masonry. After completion of the work manhole covers shall be smeared by means of thick grease.</p> <p>Mode of Measurement This shall be measured in Number</p> <p>12.40 Providing and constructing Manhole Chamber of size 1.0 M x 1.0 M x 1.0 to 1.5 M depth.</p> <p>The general specification shall be same as per Item spec. no. 12.39</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>12.41 Providing and constructing Manhole Chamber of size 0.6 M x 0.6 M up to 1.0 M depth.</p> <p>The general specification shall be same as per Item spec. no. 12.39 but CI cover and frame of 455mm dia or 605x605 mm weighing 60 kg (double seal)</p> <p>Mode of Measurement: This shall be measured in Number</p> <p>12.42 Providing and laying RCC Hume pipe of 450 mm diameter.(100001212)</p> <p>The general specification shall be same as per Item spec. no. 12.01</p> <p>Mode of Measurement: This shall be measured in Running Meter.</p> <p>12.43 Providing and laying RCC Hume pipe of 600 mm diameter.(100001213)</p> <p>The general specification shall be same as per Item spec. no. 12.01</p> <p>Mode of Measurement: This shall be measured in Running Meter.</p>		
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<p>12.44 Providing and fixing small flat back or corner lipped urinal including all the fixtures / fittings etc complete.</p> <p>The general specification shall be same as per Item spec. no. 12.29</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>12.45 Supply and fixing in position CI manhole cover</p> <p>CI manhole covers and frames shall conform to IS: 1726 and of the weight and size as specified in the schedule of quantities. The covers and frames shall be cleanly cast and they shall be free from air and sand holes and 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 and closing it shall be fitted in the frame in workmanship like manner. The cover shall be gas tight and water tight. Covers and 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.</p> <p>The rate shall include grouting the frame in CC or the RCC cover slab including finishing the soffit / top surface to match the surrounding.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>12.46 Providing and fixing 100 mm diameter GI Rain Water Pipe</p> <p>The GI pipe shall be of class as specified in the schedule of quantity and of approved make like TATA, including necessary specials such as offset, plugs, bends, shoes and welding , application of anti rusting protective galvanizing compound (over weld joint), fixing with hot dipped Galvanized MS clamps and GI bolts nuts/ washer or RCC cantilever bracket duly finished as per surrounding as per drawing / details, grouting the pipe making it leak proof, painting the pipe with two coats of enamel paint over a coat of primer.</p> <p>Mode of Measurement: The pipe line shall be measured in Running Meter.</p>		
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<p>12.47 Providing and fixing 150 mm diameter GI Rain Water Pipe</p> <p>The general specification shall be same as per Item spec. no. 12.46.but for providing GI pipe of 150 mm diameter.</p> <p>Mode of Measurement: The pipe line shall be measured in Running Meter.</p> <p>12.48 Providing & Constructing Dispersion Soak Trench</p> <p>The dispersion trench shall be 1.2 M wide and 1.44 M deep in section as specified in the schedule of quantity including earth work in excavation, preparing the base by providing 300 mm thick coarse sand layer and laying 150 mm diameter stone ware pipes in slope 1:150 with loose jointed and cover (fill up) on sides and top up to 750 mm with sound and even sized brick bats and covering the dispersion trench with Bamboo mat of grid 150 x150 mm covered with coal tar levelling the earth in a hip of 300 mm at the centre with due compaction disposal of excess surplus earth as directed.</p> <p>The invert level of the pipe shall match the invert level of the incoming pipe. Excess excavation if any required shall be paid under relevant tender item of earth work. The item shall include supply of all the materials as specified here above.</p> <p>Mode of Measurement: The dispersion trench shall be measured in Running Meter.</p> <p>12.49 Providing and fixing recessed soap dish</p> <p>The soap dish shall be white glazed vitreous of approved make and the size as specified modular to match the standard glazed tile pattern including cutting the brick work fixing including pointing with white cement etc complete.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>12.50 Providing and fixing looking mirror (100001220)</p> <p>Providing and fixing looking mirror 5 mm thick of approved make such as Modi Float / Golden fish over a backing of 12 mm thick novaboard with</p>		
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<p>T W moulded beading to match with the size of the mirror firmly fixed with brass oxidized screws , CP cup type screw etc. including the painting backing board, polishing/ painting the exposed beading/ frame etc complete as directed.</p> <p>Mode of Measurement: This shall be measured in SqM.</p> <p>12.51 Providing and fixing liquid soap bottle</p> <p>Providing and fixing liquid soap holder with soap bottle of approved make such as fixed with CP brass screws etc. complete as directed.</p> <p>Mode of Measurement: This shall be measured in Number.</p> <p>12.52 Providing & Constructing Soak pit</p> <p>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 230mm thick in cement mortar 1:6, filled with brick bat up to height as specified, RCC M20 cast-in-situ slabs 150mm thick for top cover with reinforcement, CI manhole cover 455 mm dia of 53 kg weight, 150mm dia stone ware tee, outlet vent, 75mm dia CI pipe 2m high fixed on masonry pedestal with cowl and bituministic painting, refilling, watering, consolidating etc. all complete.</p> <p>Mode of Measurement</p> <p>All above mentioned works shall be measured under the respective Trades & items as given in the Schedule of Quantities.</p> <p>12.53 Providing & Constructing Drop chamber/connection</p> <p>In cases where branch sewer enters the manholes of main pipe sewer at a higher level than the main sewer, a drop connection should be provided. Pipes and specials conforming to IS: 1729 shall be of the same size as the branch pipe sewer.</p> <p>For 150 mm and 250 mm main line if the difference in level between the water line (peak flow level and the invert level of branch line is less than 60 cm a drop connection may be provided within the manhole by giving a suitable ramp. If the difference in level is more than 60 cm the drop should be provided externally.</p>		
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<p>The excavation shall be done for the drop connection at the place where the branch line meets the manhole. The excavation shall be carried up to the bed concrete of the manhole and to the full width of the branch line excavation and backfilling shall be done as per respective specifications.</p> <p>At the end of branch sewer line SCI tee shall be fixed to the line which shall be extended through the wall of manhole by a horizontal piece of SCI pipe to form an inspection of cleaning eye. The open end shall be provided with chain and lid. The SCI drop pipe shall be connected to the tee at the top and to the SCI bend at the bottom. The bend shall be extended through the wall of the manhole by a piece of pipe which shall discharge into the channel. Necessary channel shall be made with cement concrete of grade M-20 and finished smooth to connect the main channel. The joint between SCI pipe and fittings shall be lead caulked. The joint between SCI tee and SW branch line shall be made with cement mortar 1:1 (1 part cement : 1 part fine sand) as for encased all round with minimum 15 cm thick concrete 1:5:10 (1 part cement:5 part coarse sand : 10 part graded stone aggregate 40 mm nominal size) and cured. For encasing the concrete around the drop connection the necessary centring and shuttering shall be provided the holes made in the walls of the manhole shall be made good with brick work in cement mortar 1:5 (1 part cement : 5 part coarse sand) and plastered with cement mortar 1:3 (1 part cement: 3 part fine sand) on the inside of the manhole wall. The excavated earth shall be back filled in the trench in level with the original ground level.</p> <p>Mode of Measurement</p> <p>All above mentioned works shall be measured under the respective Trades & items as given in the Schedule of Quantities.</p> <p>12.54 Providing & Constructing Road gully chambers/ Yard gully</p> <p>The chamber shall be of brick masonry and shall have a CI grating with frame fixed in 150 mm thick cement concrete of grade M-20 at the top. The size of the chamber shall be taken as clear internal dimensions of the CI frame. The chamber shall have a SW connection pipe, the length of which between road gully chamber and the point of discharge to drain or to open ground shall be measured separately. The chamber shall be built at the locations indicated in drawings.</p>		
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Bed concrete, brick work, plastering RCC work. Excavation, backfilling etc. shall be as per details given on the drawing and in compliance with the requirements laid down in the specifications for the respective items.

The MS grating cover shall be hinged to the frame to facilitate its openings for cleaning and repairs. The weight of grating shall be 75 kg minimum or as specified.

After the completion of the work the exposed surfaces of the grating and the frame shall be painted with two coats of synthetic enamel paint.

Mode of Measurement:

All above mentioned works shall be measured under the respective Trades & items as given in the Schedule of Quantities.

12.55 Providing & 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.

Note:

1. All Samples of Fixtures / Fittings shall be got approved from Engineer / Consultant prior to bulk ordering.
2. The equivalent brand shall be got approved from Engineer/ Consultant in writing prior to bulk ordering.

12.56 Providing & Fixing Toilet Set For Handicap Persons (100026496)

Providing and Fixing set for Handicap Persons including all accessories as per the recommendation of manufacturer, with connector pipe & bend 110 dia, connector ring and Lip ring 110 dia etc. with cutting and making good the walls and floors, silicon joint sealing etc complete as directed.

Mode of Measurement: This shall be measured in Number.

12.57 Providing & Fixing SFRC Cover (100020291)

Providing and fixing heavy duty HD-20 grade designation SFRC manhole covers and frame of 560mm internal diameter confirming to IS:12592, total weight of cover and frame to be not less than 182 kg. fixed in cement concrete 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) including centering and shuttering all complete.

Mode of Measurement: This shall be measured in Number.

12.58 Providing & Fixing “Foamcore” Upvc Pipe (100021374, 100021375 & 100024080)

Providing and laying different dia (Nominal Diameter) uPVC, FOAMCORE, SN8 pipe of approved make including all necessary fittings, excavation of trenches in soil/murum/rock up to 1500mm depth, providing & laying 150 mm thick BBCC 1:5:10 (1 part cement, 5 part coarse sand, 10 part brickbat) as bedding, laying and jointing the pipe in required line, level and as per manufacturer's specification, encasing the pipe by providing & laying with 100mm thick PCC 1:5:10 (1 part cement, 5 part coarse sand, 10 part stone aggregate) at all the three sides around of the pipe, refilling of the trenches, watering, compacting and testing before concealing the pipe etc. complete as directed.

Mode of Measurement: This shall be measured in running meter.

12.59 SEWERAGE TREATMENT PLANT PREFAB TYPE (100020290)

1. The job of STP has to be done on a Turnkey basis, therefore the contractor shall be fully responsible for designing, preparation of drawings and design calculations, supply of material, installation, testing and commissioning, getting final certifications related to the final quality of treated effluent, from all the concerned Pollution & Environmental Authorities & Operation and Maintenance of the system for the mentioned period.
2. **Proposed Capacity of STP is 5 m³/day.**
3. Generally but not limited to the following main activities are expected from the Executing Agency in a sequential manner.

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<p>Preparation of scheme based on the design data, statutory guidelines, P & I , flow diagram, and getting it approved from the consultant.</p> <p>Preparation of detailed Shop drawings, Technical Documents and getting it approved from the consultant.</p> <p>Makes of all Electro – Mechanical equipment /components shall also get approved from IDMC .</p> <p>4. Design Data</p> <p>(The data as provided below are only for guideline purposes and are to be verified by the Executing Agency with respect to state PCB norms/ CPCB norms.)</p> <p>4.1 Site Location: The site is located in Barauni, Begusarai, Bihar.</p> <p>4.2 Air Temperatures</p> <p>(a) Annual mean Max. : 42°C</p> <p>4.3 Rainfall</p> <p>Normally rains occur between June to September.</p> <p>(a) No. of rainy days : 55.9 days</p> <p>(b) Average Annual rainfall : 1130 mm</p> <p>4.4 Wind</p> <p>From May to September the wind direction is prevalently from the East & from October to April it is mainly from the West direction.</p> <p>4.5 Ground Water</p> <p>To be verified from the site. Very High Water table level is encountered at site at about 0.50m below NGL. .</p> <p>4.6 Soil Characteristics</p> <p>To be verified from the site. Predominantly Silty Clay (CI)</p>		
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4.7 Accessibility of Site

The site is well connected by all-weather roads from all directions.

4.8 Construction Material Available

As the site is well connected by all-weather roads construction material can easily be available at site. Skilled and unskilled laborers are available.

5. Influent Characteristics

5.1 Type of Waste Water: The influent is the product of the wastewaters from different activities such as:

Domestic sewage from the toilets & bathrooms.

Oil, Grease and food waste etc.

5.2 Characteristics of Untreated & Treated Effluent

Waste Water Characteristics

Duration of flow to STP :	24 hours
Peak Factor :	3
Temperature :	Maximum 32.8 °C
pH :	6.5 to 7.5
Color :	Mild
T.S.S (mg/l) :	200 to 250 mg/l
BOD(5) (mg/l) :	250 to 300 mg/l
COD (mg/l) :	400 mg/l
Oil and grease :	50 mg/l

Treated Effluent Characteristics after Secondary treatment

pH :	6.5 – 8.5
B.O.D. :	Less than 30 mg/l
C.O.D. :	Less than 80 mg/l
Total suspended solids :	15 – 30 mg/l
Oil and grease :	< 10 mg/l

Final Effluent Characteristics after Tertiary Treatment

pH	:	6.5 – 8.5 mg/l
B.O.D.	:	Less than 10 mg/l
C.O.D.	:	Less than 50 mg/l
Total suspended solids	:	Less than 10 mg/l
Oil & grease	:	<2 mg/l
Ammonical Nitrogen	:	< 5 mg/l
Total Nitrogen	:	< 5 mg/lit
Fecal Coliform	:	< 100 MPN/100 ml.

5.3 It may clearly be understood that the client wants to make re-use of treated effluent. The water after above treatment shall go for horticulture/ Gardening purposes. The water from the tertiary treatment shall be re-used. Hence, it is imperative that the contractor ensures that the effluent is usable for above purposes.

Description of Treatment Process & Units

6.1 Without restricting to the generality of the foregoing, the work shall consist of:-

The civil works for the Sewage collection tank, pump and skid civil Foundation for the Packaged STP units will be paid under respective Civil works items.

6.2 Design , Supply , Installation & commissioning of all MS components (3 mm FRP lining inside and epoxy painting outside) , to consist of:-

Bar screen & Fine screen- SS304
 Anoxic tank
 MBBR tank
 Tube Settler
 Clarified water tank/ Filter feed tank
 Treated water tank
 Sludge holding tank

6.3 Mechanical Equipment

Design, supply, erection, commissioning and testing of all mechanical equipment, as discussed in the proceeding sections, generally comprising of:

Bar Screen- 1 lot.
Root Air blowers with motor and acoustic enclosure related accessories – 2 nos.
Air Diffusers (Fine bubble – Silicon MOC) – 1 lot..
Raw effluent re-lift pumps- 2 nos.
Sludge return pump- 2 nos.
Filter feed pumps- 2 nos .
Agitator in Anoxic tank- 1 no.
Basket type Centrifuge & Sludge handling arrangements- 1 lot
Treated water pump- 2 nos
All interconnecting Pipe-lines, valves, NRV's . Guages, instrumentation and accessories- 1 lot
Chlorine dosing pump with dosing tank 1 no.
Pressure Sand Filter- 1 no.
Activated carbon Filter- 1 no.
Ozone treatment system- 1 lot
Bio-media for MBBR Tank- 1 lot
Tube settler Media- 1 lot.
Any other equipment required for functioning of STP or as per Clients' / as per approved design / statutory requirements.

The makes and the capacities of the units to be got approved from IDMCas per design requirements.

6.4 Electrical Equipment

Design, Supply, Erection, Commissioning and Testing of all Electrical equipment generally comprising of:

Electric motors for all equipment as required.
Motor control centre completes with all internal wiring and accessories.
Electrical cables from approved panel (Non compartment type) to all electric motors and units.
Electric earthing stations as per I.E.E. rules.
All internal lighting & exhaust system etc.

6.5 Piping Work

Laying of all piping work as per detailed designs and generally for:

All above mentioned civil structure and tanks.

For the interconnection of the various equipments, sludge sump, pump house and control room.

All interconnecting piping between various units bypass etc.

Effluent piping within limits as shown on the drawings.

Piping required for providing water supply & drainage for the Testing Laboratory.

6.6 Treatment Process

The sewage from the last manhole of the Toilets shall be collected into collection/ Equilisation sump .

The sewage shall be pumped and passed through the Fine Screen . After Screening the effluent shall be led to Anoxic tank & MBBR reactor where it is subjected to biological treatment. In this process aerobic microorganism brings out the oxidation of organic matter in suspension and attached form. The Bio-media itself is in Fluidized state offering greater contact between Microorganism and sewage thereby increasing the BOD removal efficiency. Air Blowers with fine bubble silicon Membrane diffusers supply the required oxygen. The mixed liquor shall be taken in the Clarifier (tube Settler unit). The settled sludge from the clarifier shall be re-circulated to MBBR Reactor for the maintenance of required micro biological population and the balance is pumped to the sludge de-watering system . The filtrate from the sludge dewatering system shall be taken into the equalization tank.

The clarified sewage then shall be subjected to chlorination to disinfect the biomass as well as eliminate the residual organics. The chlorination shall be carried out in Filter feed tank . The water shall be pump to Tertiary treatment system - Multi Graded Filter followed by Activated Carbon Filter and finally pumped through Ozonator The effluent after treatment shall be pass through Ozonator will be fit for reuse in gardening. The dried sludge from the sludge de watering can be used as manure. The treated effluent shall meet all the Pollution Control Board Norms and could be used for gardening within the premises by the client.

APPROVALS FROM STATUTORY AUTHORITIES

Obtaining approval & Consent (Consent to Operate) from relevant authorities like State Pollution Control Board etc. However, any statutory fees paid by the contractor shall be reimbursed against submission of documentary proof.

Test-run of the plant:

After stabilization of STP Plant , a one month **guarantee test run** shall be provided by the Contractor during which daily monitoring of raw and treated effluent quality and effluent throughput shall be done and log sheets to be maintained duly signed by the representative of project authority .

Over and above the daily monitoring of effluent quality, the Contractor shall arrange at his own cost, **analysis of the composite raw and treated Waste water samples for 7 consecutive days for all the effluent parameters specified in the consent note at an external laboratory approved/ recognised by the State Pollution Control Board / NABL / Engineering collage. The results shall conform to the performance guarantee for the plant which shall be a pre-requisite for the takeover of the plant.** In case of non-compliance to the guaranteed treated effluent quality for given design input conditions, the Contractor shall take necessary measures to bring the plant to the desired performance.

Less effluent flow condition

In case during the guarantee test run, the effluent flow or organic load shall be found to be less than the rate input, the contractor shall undertake that as and when rated throughput and organic load conditions are available, the contractor shall extend necessary assistance to achieve the guaranteed output quality, through re-deputation of his personnel at a later date at mutually agreed terms.

Training

The Contractor shall train the plant personnel in the Operation & Maintenance practice for the Sewage Treatment Plant units during the guarantee test run.

Operation Manual

The scope of services shall include the Preparation and Submission of Operation & Maintenance Manual (One soft copy and 3 sets of hard copies) prior to plant commissioning. The Manual shall cover the following aspects:

Brief process description & flow sheet. Unit wise function and description, equipment details with sizes and as build drawings, operational instructions, maintenance procedures. Plant start-up, commissioning, normal operations, effluent parameters testing procedures, emergency operation steps etc. required for smooth operation & maintenance of STP units.

BATTERY LIMITS FOR THE STP WORK

- For Raw Sewage: the pipeline from Last manhole near the STP.
- For Disposal of treated water: Pumping/ Disposal of STP treated water from STP final treated water tank shall be arranged by Project authority.
- For service water pipeline to be tapped from Toilet Building.
- Disposal of sludge is to be arranged and done by project authority.

ADDITIONAL NOTE FOR CIVIL WORKS

All applicable Royalties, Seigniorage fees for various construction materials to be paid by contractor and receipts to be submitted to the client for records.

EARTH WORK

Excavation to be generally carried out using Mechanical /Hydraulic equipment.

Manual excavation shall be done in area where such excavation is extremely difficult or not to be done due to constraints. Decision of Engineer in charge shall be final & binding on such matter.

CONCRETE

In case there is bulging / minor honey combing the contractor will have to rectify the work at his own cost.

The Contractor is entirely responsible for the design of concrete mixes. The design is however, to be approved by the Engineer in charge.

Only River Sand should be used. However if silt content is more than permissible limit, washing of sand in rotary screw type washing machines is a must.

MASONRY WORK

Top junction of masonry and RCC member to fill by polymer modified mortar with pebble dash to avoid cracks.

Incase Through stones are not available, than Header blocks of M10 grade concrete of minimum size of 150 x 150 x wall thk. should be precasted and laid as per specification at no extra cost.

No extra rate will be paid for any curved shape in PLAN for any type of masonry

FINISHING

For cement plaster, gypsum plaster, POP punning if any excess thickness occurs due to the irregularity of the brick or RCC work, than the same should

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<p>be made up by applying single coat of rough plaster in the affected for which no extra rates will be paid.</p> <p>If the silt content is more than 3% by weight, all sand used for plastering to be washed using automatic sand washing machine only.</p> <p>Wherever Stone / Tile Cladding / Skirting / Dado Jambs / Risers is to be done, Cement plaster will not be Paid & It will be done as per relevant item specification.</p> <p>All painting work is suppose to be completed in two coats so as to give good finish. In case the finish is not good the contractor will have to rectify the work by additional coat of paint at his own cost. Nothing extra is payable for painting work carried out on rough or sand face plaster.</p> <p>No extra rate shall be paid for any curved shape in PLAN for any type of plaster, painting, false ceiling, wall cladding etc.</p> <p style="text-align: center;">Flooring work</p> <p>All stone samples to be approved by Arch/IDMC</p> <p>Granites with oil or wax, etc. finish will be rejected tolerance in thickness of Granite/Baroda green/ Marble will be $\pm 0.5\text{mm}$.</p> <p>Stones coated with coloured polish would be rejected. Usage of car patch is not allowed.</p> <p>The Araldite and size zero marble chips/grit to be applied on stone minimum 12 hours before laying in place.</p> <p>Rates for double scaffolding to be included in all works wherever required for any height.</p> <p>All floorings, staircases to be covered with pop laid on PVC sheet to protect the work done by the contractor at his own cost and expense and he is responsible to maintain the same until handover.</p> <p>All tiles have to be of 'A' grade best quality.</p>		
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<p>All exposed edges of the cills / jambs / treads etc. to be polished at no extra cost.</p> <p>All stones to be crack free.</p> <p>No extra rate shall be paid for any curved shape in plan/ elevation for any type of flooring, skirting, dado, cills, covings etc.</p>		
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<p style="text-align: center;">TECHNICAL SPECIFICATION</p> <p>13. ADDITIONAL NOTE TO TECHNICAL SPECIFICATION TO BE IMPLEMENTED/ ENSURED AT SITE</p> <p>1. Documentation for ancillary consumable items used in the works</p> <p>Formal records for the consumable materials used in execution of various item of works listed below should be maintained in “Material Receipt Register” and Reconciliation statement for all such materials should be prepared & submitted along with the contractor’s work bill to ensure that actual consumption of materials is in line with the theoretical requirement/manufacturer’s specifications:</p> <ul style="list-style-type: none"> i) Chemicals for Anti-termite treatment ii) Admixtures (used in concrete mix) iii) Water proofing chemicals/membranes/coatings iv) Sealants/ Boards used for expansion/construction/contraction joints v) Observation register for actual unit weight of reinforcement steel, structural steel, Aluminium sections, roofing sheets for which unit weights/ gauges were specified in SOQ/ approved manufacturer’s specifications. vi) All type of painting materials (external/internal/special) including primers vii) Floor hardener/ special flooring joint materials viii) All type of coatings (Epoxy, PU etc) ix) All type of piping material (MS, SS,GI, PVC, uPVC, CPVC, HDPE etc) x) All types of roof sheeting material xi) Bitumen 80/100 <p>Contractor to submit a copy of invoice for all the aforementioned consumable materials supplied to project site as directed by IDMC Engineer -in-charge.</p>		
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<p>2. In case of materials supplied of approved makes, contractor to submit manufacture's test certificates (MTC) for each lot of materials supply of material for physical verification (Batch number & Shelf life) by Engineer - in-charge before put to use .</p> <p>3. All Flooring, Dado materials should be put in use only after physical verification by Engineer -in-charge as specified in Item specification and quality parameters.</p> <p>4. In case of Cement & reinforcement steel, in addition to manufacturer's tests certificate periodical tests from the approved laboratories should also be carried out as specified in quality control section.</p>		
IDMC	ADDITIONAL NOTE ON TECH. SPEC	BIDDER

TECHNICAL SPECIFICATION

14. Quality Control Process**QUALITY CONTROL PROCESS TO BE FOLLOWED**

Quality Control is an essential part of any construction process for ensuring Quality. All materials to be used, all methods adopted and all works performed are strictly to be in accordance with the requirements of the specifications and approved drawings. Quality Control measures leads to construction of improved quality, conformity and ensures utilization of better quality of materials.

The **main objective** of Quality Control (QC) is to obtain independent & objective assessment of the technical quality of all the civil, structural, electrical and all ancillary miscellaneous construction works at different stages of construction and to ensure that the buildings and structures are constructed as per desired standards and in accordance to the specifications.

The Construction contractor is responsible for implementing and supplementing a quality control procedure to ensure that all aspects of work meet the standards set forth in the specifications and is of acceptable quality. The Construction contractor is totally responsible for quality throughout and is to take all necessary measures to ensure quality by adopting correct construction practices to produce the end products of acceptable quality.

Ensuring execution of quality work of durability and uniform performance by the Contractor is the most important aspect of the Quality Control.

The basic concept of this process is that the construction Contractor constructs & performs testing as per the following format and requirement as minimum at his risk and cost to ensure a quality product.

Sr. No.	Name of Test	Testing Method	Frequency of Test	Specification Requirement	Remarks
(A) EARTH FILLING (Soil)					
1	Density of compacted layer	IS:2720 Part 8, Part 28,	1 test per 400 Sqm area per 600 mm depth of filling or part thereof	Compaction 95 % of max dry density with moisture content differing not more than 4 % of the optimum content.	Tests to be performed at site Laboratory and external laboratory.
(B) CONCRETE WORK					
1	Compressive Strength test (M20 to M55)	IS: 516 (Concrete cube compressive strength test)	Upto 5m ³ - 1Set, >5-15m ³ -2 Sets, >15-30m ³ -3Sets >30-50m ³ -4Sets Above 50m ³ - 4+one additional sample for each 50m ³ part thereof.	Acceptance criteria specified as per IS 456:2000.	Tests to be performed at site Laboratory and periodically (once in a month minimum 1 set of six cubes to be sent at the external laboratory)
2	Slump Test	IS 456: 2000, IS 1199: 1959	At start, end & intermittently for each pour card issued every day	As per design mix /IS code	Test to be performed at the Site laboratory and recorded in the pour card itself. (Designed & Actual)

3	Non Destructive Test (NDT)	IS:13311 Part 2			If required/ suggested by Structural consultant/ IDMC.
4	Core Cutting	IS:516			Same as 3

(C)	BRICKS
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1	Water Absorption	IS: 3495 Part-2	One test per every 50000 Nos of bricks or part thereof for	Max. 20%	Site test and External laboratory test
2	Compressive Strength	IS: 3495 Part-1	make/source. One external lab test per month must be	As per PO specification	
3	Efflorescence test	IS:3495 Part-3	ensured during supply period at site.	Shall be Nil	
4	Dimension Tolerances (Limits per 20 bricks)	IS13757: 1993, IS 1077: 1992	a) For modular size Length 3720 to 3880 mm (3800 ± 80 rom) Width 1760 to 1840 mm (1800 ± 40 rom) Height (for 90mm) 1760 to 1840 mm (1800 ± 40 rom) Height (for 40mm) 760 to 840 mm (800 ± 40 rom)	b) For non-modular size Length 4520 to 4680 mm (4600 ± 80 rom) Width 2240 to 2160 mm (2200 ± 40 rom) Height (for 70mm) 1440 to 1360 mm (1400 ± 40 rom) Height (for 30mm) 640 to 560 rom (600 ± 40 rom)	MTC to be obtained if available.

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5	Physical verification	IS: 3495 1992	For each supply day	Free from cracks & flaws		
(D) CEMENT						
1	Fineness %	IS 4031 Part-1, 2 & 15	Each Consignment if MTC is not produced. & 1 test per 50 MT supplies of one Make/Grade/Type & Test per change of Make/Grade/Type	10% maximum	External lab/site lab test MTC must be obtained for each consignment	
2	Setting time	IS: 4031 Part-5		Initial 30min, Final 600min.		
3	Compressive strength	IS: 4031 Part-6		Min. 43 MPa		
4	Specific Gravity	IS: 4031 Part-11		3.10 - 3.15		
5	Soundness test	IS: 1489 Part-1, IS: 4031 Part-3		Max.10mm/ 0.8 %		
(E) WATER						
1	Chloride as CL	IS: 3025 Part-1&32 ,	1 test per Source and every three months	500 mg/litre max.	External lab test.	
2	Inorganic matter	IS: 3025 Part-18, IS: 456		3000 mg/litre max.		
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3	Organic matter	IS: 3025 Part-18, IS: 456		200 mg/litre max.	
4	Suspended solids	IS: 3025 Part-17, IS: 456		2000 mg/litre max.	
5	Sulphates (As SO ₃)	IS: 3025 Part-24, IS: 456		400 mg/litre max.	
6	PH value	IS: 3025 Part-11, IS 10500, IS: 456		6 to 8	

(F)	REINFORCEMENT STEEL (Fe500)
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1	C/S area	IS: 1786	25 MT or part thereof for each diameter per consignment of similar make	As per respective diameter	External lab test and MTC must be obtained for each consignment
2	0.2% Proof Strength	IS: 1786		Min. 500 N/mm ²	
3	Ultimate tensile strength	IS: 1786		Min. 8% more than actual 0.2% proof stress & > 545 N/mm ²	

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(I)	ADMIXTURE				
1	Chemical Tests	IS: 9103	Every three Month/ Change of source whichever is earlier. **	Chemical test as per IS **(If MTC is not produced, test for each batch)	External lab test. MTC must be obtained for each batch.
(J)	PAVER BLOCKS				
1	Water Absorption	IS: 15658 - Annex C	1 test per 10000 No. or part thereof	Average shall not be more than 6% & individual restricted to 7%	External lab test. MTC must be obtained for each consignment
2	Compressive Strength	IS: 15658 - Annex D		As per PO	
(K)	SOLID/HOLLOW CONCRETE BLOCKS				
1	Water Absorption	IS: 2185 Part-1	1 test per 5000 No. or part thereof	Max. 10 %	External lab test and MTC to be obtained for each consignment
2	Compressive Strength	IS: 2185 Part-1		As per PO	
(L)	FLOOR TILES				
1	Flexural Strength	IS: 1237, IS: 13801 ANNEX-F	1 test per 2000 No or per part thereof/Con segment	Min 3 N/mm2 Or PO Specs.	External lab test and MTC must be obtained for each batch.
2	Water Absorption	IS: 1237, IS: 13801 ANNEX-E		Max. 10% or PO/ Manufacturer Specs.	
IDMC					

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3	Abrasion	IS: 1237, IS: 13801 ANNEX-G		Avg. Max. 2 mm or PO/ Manufacturer Specs.	
4	Physical dimensions.	IS: 1237, IS: 13801 ANNEX- B&C	1 test per 100 nos.	Manufacturer specifications.	Site lab test/ External Lab test & MTC.
(M)	TEAK WOOD				
1	Physical Verification & Dry density.		Each Consignment	Well-seasoned by a suitable process & shall be free from decay, Fungal growth, Splits etc.	External lab test. Density for approval of consulta nt.
2	Moisture Content	IS:4021 & 287	Per 1 Cum or part thereof or minimum per consignment.	10 % To 12 %	
(N)	MILD (STRUCTURAL) STEEL				
1	Unit Weight	IS:2062	Each category per consignment or 25 MT for each category per	As per IS	External lab test. MTC must be obtained.
2	Yield stress			250 N/Sqmm,	
3	Ultimate tensile			410 N/Sqmm	
IDMC					

IDMC LIMITED		Section IV		Page - IV - 295	
4	Elongation (%)		consignment whichever is less	23 % Min.	
(O)	FLUSH DOOR SHUTTER				
1	End immersion test	IS 2202-1999 (Part-I), IS 4020 (part-13)	1 test per 50 shutters or part thereof	There should not be any delamination	External lab test. MTC must be obtained.
2	Knife test	IS 2202-1983 (Part-II), Procedure IS 4020 (part-14)		Reported as 'Pass standard', 'excellent' or 'poor'.	
(P)	ALUMINIUM DOOR /WINDOW MEMBERS				
1	Thickness of anodic coating	IS 5523-1983	Per Category/ Consignment	As per PO/ manufacturer specification	External lab test. MTC must be obtained.
2	Wall Thickness & Sizes of Aluminum members	MTC from Approved Manufacturer			

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3	Weight per meter	MTC from Approved Manufacturer			
(Q) ROOFING (GALVALUME) SHEETING					
1	Thickness of sheet	MTC from Approved Manufacturer	Per Category/ Consignme nt	As per PO/ manufactur ers specification	External lab test. MTC must be obtained.
2	Coating thickness	MTC from Approved Manufacturer			
3	Standard weight of sheet	IS 1608:2005			
4	% elongation	IS 1608:2005			
5	Yield strength (N/mm2)	IS 1608:2005			
6	Ultimate tensile strength (N/mm2)	IS 1608:2005			
(R) ROOFING SHEET INSULATION					
1	Chemical for Resin Bonded fibre glass wool	IS 8183-1993	Per Category/ Consignme nt	As per PO specification	External lab test. MTC must be obtained.
2	Coating hardness	ASTM D 3363			
3	Testing water resistance of coating	ASTM D 2247			
(S) ROAD/PAVEMENT					
(1) Aggregate					
IDMC QUALITY CONTROL PROCESS BIDDER					

IDMC LIMITED		Section IV		Page - IV - 297	
I	Impact Value	IS: 2386 (Part 4), IS: 383	1 test per 100 cum	Max. 30%	Site test & External Lab test
II	Crushing Value	IS: 2386 (Part 4), IS: 383	1 test per source	Max. 30%	
III	Loss angles abrasion value	IS: 2386 (Part 4), IS: 383	1 test per source	Max. 30%	
IV	Flakiness Index & Elongation Index	IS: 2386 (Part 1) IS: 383	1 test per 100 cum	Max. 35%	
V	Water Absorption	IS: 2386 (Part 3), IS: 383	1 test per 100 cum	Max. 2%	
VI	Specific Gravity	IS: 2386 (Part 3), IS: 383	1 test per source	Min. 2.5	
VII	Stripping Value of aggregate for BM/AC	IS: 2386 (Part 3), IRC, IS: 383	1 test per source	Max 25%	
VIII	Soundness	IS: 2386 (Part 4), IS: 383	1 test per source	Max. 12%	
(2) Bitumen					
I	Softening point	IS: 73, IS: 1205	1 test per batch of bitumen supplied in bulk/ drums or part thereof		External lab test. MTC must be obtained.
II	Penetration	IS: 73, IS: 1203			
III	Elongation	IS: 73			
IV	Wax Content	IS: 73			
V	Flash/Fire point test	IS:73, IS:1209			
VI	Ductility	IS: 73, IS: 1208			
(3) Sub-Grade/Sub-Base					
IDMC					

IDMC LIMITED		Section IV		Page - IV - 298	
I	Density	IS: 2720 (Part 28)	1 test per 500 sqmt.	More than 95%	
II	CBR Test	IS: 2720 (Part 16)	1 test per 500 sqmt.		
(T)	GRANITE STONE				
1	Water Absorption	IS 14223 (Part 1)	Per Category/ Consignme nt	Max. 0.5%	
2	Compressive Strength	IS 14223 (Part 1)		Min. 1300 kg/cm2	
3	Hardness (mohs Scale)	IS 14223 (Part 1)		6 to 7	
(U)	UPVC PIPE (Potable Water)				
1	Internal Hydraulic Pressure	IS: 4985	Per Category/ Consignme nt		
2	Density	IS: 4985			
3	Sulphated ash Content test	IS: 4985		Max. 11%	
(V)	PLASTIC EMULSION PAINT				
1	Drying Time	IS: 15489	Per Category/ Consignme		
2	Temperature Stability	IS: 15489		Shall pass	
IDMC		QUALITY CONTROL PROCESS		BIDDER	

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3	Resistance to alkali	IS: 15489	nt		
(W)	PILE CONCRETE				
1	Initial Load Test	IS: 2911 (Part 4)	Min. 2 nos. or as specified in contract		Integrity tests are recommended for 100% bored cast in situ piles cast by remix method for piles longer than 10m
2	Routine Load Test	IS: 2911 (Part 4)	As required		
(X)	RMC CONCRETE				
1	Ready Mix Concrete	IS:4926			Proportion of all its constituents & their relevant test must be checked & approved from structural consultant.

Notes:-
1. External laboratory means any government engineering college/laboratory or any other laboratory having National Accreditation Board for Testing and Calibration Laboratories (NABL) accreditation.

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<p>2. MTC: - Manufacturers Test Certificate.</p> <p>3. ASTM-American Society for Testing and Materials</p> <p>4. Technical specification (Section-IV) shall also be followed.</p>		
IDMC	QUALITY CONTROL PROCESS	BIDDER

SECTION – IV-A

TECHNICAL SPECIFICATIONS (ELECTRICAL WORKS)

IDMC Anand	Section IV-A	Page IV-A -1
<p style="text-align: center;">TECHNICAL SPECIFICATION (SECTION – IV) (INTERNAL ELECTRIFICATION)</p> <p style="text-align: center;">CONTENTS</p>		
SL.N.	Description	PAGE NO.
1.0	Standards and codes	IV-2
2.0	Concealed/Surface Conduit Work	IV-3
3.0	Wiring & Switches	IV-11
4.0	Power Cable Work	IV-18
5.0	Telephone, computer data & Television Wiring	IV-23
6.0	Earthing & Lighting Protection System	IV-26
7.0	Supply & Installation of Lighting Fixtures/ Fans	IV-28
8.0	Street Lighting	IV-30
9.0	Switch Boards & Distribution Boards	IV-36
10.0	Completion Tests & Drawings	IV-43
11.0	Mode of Measurements	IV-47
Technical Specifications - Internal Electrification		BIDDER

IDMC Anand	Section IV-A	Page IV-A -2
<p style="text-align: center;">TECHNICAL SPECIFICATIONS FOR INTERNAL ELECTRIFICATION WORKS</p> <p>The following specifications will apply under all circumstances to the equipment to be supplied and installed against this contract and it is to be ensured that the contractor shall obtain for himself at his own expense and on his own responsibility all the information which may be necessary for the purpose of submitting the tender and for entering into a contract keeping in view the specifications of installation and inspection of site etc.</p> <p>1.0 STANDARDS AND CODES</p> <p>The following Indian Standard Specifications and code of practices amended as on date will apply to the equipment, materials and installation for this contract:</p>		
a)	Steel boxes for enclosure of electrical accessories	IS 5133 – 1969 Part I
b)	Fittings for rigid steel conduits	IS 2667 – 1964
c)	Rigid PVC conduits for electrical wiring	IS 9537 Part III
d)	Accessories for rigid PVC conduits for electrical wiring	IS: 2667-1964 & IS: 3857-1966
e)	Switch socket outlets	IS 4615 - 1968
f)	Three pin plug and socket outlets	IS 1293 - 1967
g)	Switches for domestic and similar purpose	IS 3854 - 1966
h)	PVC wires	IS 694 – 1990
i)	PVC Insulated Heavy Duty Cables	IS 1554 - 1976
j)	Conductor for Insulated Electric Cables	IS 8130 - 1984
k)	PVC Insulated & PVC Sheathed solid Al conductor cables – 1100 volts.	IS 4288 - 1988
l)	Low Voltage Switchgears & Control Gears	IS 13947 – 1993
m)	Switchgear bus bars	IS 375 - 1963
n)	Enclosures for low voltage switchgear	IS 2147 - 1962
<p style="text-align: center;">Technical Specifications - Internal Electrification BIDDER</p>		

IDMC Anand		Section IV-A	Page IV-A -3
o)	Moulded Case Circuit Breakers	IS 13947 - 1993	
p)	Miniature Air Circuit Breakers for AC Circuits	IS 13947 – 1993	
q)	Code of Practice for Installations & Maintenance of power cables	IS 1255 – 1983	
r)	Code of Practice for Electrical wiring installation	IS 732 - 1989	
s)	Code of Practice for Selection, Installation & Maintenance of Switchgear & Control gear	IS 10118 – 1982	
t)	Code of practice for Earthing	IS 3043 – 1987	
u)	Code of Practice for Lightening protection	IS 2309 – 1989	
v)	Code of Practice for personal hazard & fire safety of buildings	IS 1644 – 1960	
w)	Code of Practice for Electrical Installation Fire Safety of Building	IS 1646 – 1982	
Indian Electricity Rule 1956 & Indian Electricity Act 1910 amended as on date and NATIONAL BUILDING CODE OF INDIA			
2.0 CONCEALED / SURFACE CONDUIT WORKS			
2.1 Rigid PVC Conduits specification & size			
2.1.1 Rigid PVC Conduits: These shall be rigid PVC conduit of perfectly circular tubing having minimum wall thickness of medium gauge 1.8 mm approved by F.I.A. & I.S.I. and shall conform to IS 9537 Part III. No PVC conduit of less than 25 mm dia shall be used for electrical wiring.			
i) Up to 38 mm diameter - min. 1.8 mm wall thickness			
ii) Above 40 mm diameter - min. 2.2 mm wall thickness			
2.1.2 PVC Conduit fittings: Connections between PVC conduit shall be with rigid PVC conduit accessories only. PVC conduit accessories / fittings such as couplers, unions, bends, tees, junction boxes, reducers, chase nipples, split couplings, plugs etc. shall be specifically designed and manufactured for their particular			
Technical Specifications - Internal Electrification			BIDDER

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<p>application. All conduit accessories shall be PVC grip type and shall conform to IS: 2667-1964 and IS: 3857-1966. As far as possible, the conduit system shall be so laid out that it will alleviate the use of tees, and sharp bends. No elbows shall be used and only PVC regular bends, slip in type shall be used for bonding/turning.</p> <p>In long distance straight runs of conduits, inspection boxes at reasonable intervals shall be provided. The conduit pipes including all bends, unions, couplers, tees, junction boxes etc. forming part of the conduit system shall be adequately supported. Bending of conduit with large radius while laying at site to minimize use of readymade bends shall be adopted as far as possible. For diversion purpose pipes shall be bent."</p> <p>2.1.3 Conduit Cross Section / Size : The conduit shall be of ample section area to facilitate the drawing of PVC wires/cables. In no case shall the total cross section of wires/cables measured overall, be more than half the inside area of the conduits. Refer Table provided at Clause No. 13, Page IV-48 for maximum no. of wires that can be pulled in various sizes of conduits.</p> <p>MINIMUM CONDUIT DIA (O.D.) FOR ELECTRICAL WIRING - 25 MM</p> <p>2.1 (A) Hot DIP Galvanized Steel Conduits specification & size</p> <p>2.1.1. (A) Steel Conduits: These shall be hot dip galvanized steel of wall thickness 16 SWG (1.6 mm thick) up to 32 mm and 14 SWG (2 mm thick) for sizes above 32 mm. These shall be heavy duty, electric resistance welded, electric thread type, having perfectly circular tubing and capable of being cleaned and tight fitting joints.</p> <p>2.1.2 (A) Steel Conduit Connection: Connections between steel conduits shall be with screwed couplers ensuring screwed metal to metal contact. Length of the threads in all cases of joints shall be between 13 to 19 mm. Connections between screwed conduits & sheet metal boxes shall be by means GI hexagon check nuts fixed inside the box. Joints in conduit and termination shall be free of burrs to avoid damage to insulation of conductors while pulling through the conduits.</p>		
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<p>2.1.3 (A) Conduit Bends: Conduit bends shall of 16 SWG. As far as possible the conduit system shall be so laid out that it will alleviate the use of tees, elbows and sharp bends. Bending of conduit with large radius while laying at site to minimize use of readymade bends shall be adopted as far as possible. No length of conduit shall have more than the equivalent of two-quarter bends from inlet to outlet.</p> <p>2.1.4 (A) Conduit Cross Section / Size: The conduit shall be of ample section area to facilitate the drawing of PVC wires/cables. In no case shall the total cross section of wires/cables measured overall, be more than half the inside area of the conduits. Refer Table provided at Clause No. 13, Page IV-48 for maximum no. of wires that can be pulled in various sizes of conduits.</p> <p>MINIMUM CONDUIT DIA (O.D.) FOR ELECTRICAL WIRING - 25 MM</p> <p>2.1 (B) Metallic Conduits specification & size</p> <p>2.1.1. (B) Steel Conduits: These shall be Mild steel of wall thickness 16 SWG (1.6 mm thick) up to 32 mm and 14 SWG (2 mm thick) for sizes above 32 mm, heavy duty, electric resistance welded, electric thread type, having perfectly circular tubing and capable of being cleaned and tight fitting joints. The conduit shall be protected from rust by two coats of primer and one coat of black enamel paint applied inside and outside in its manufactured form.</p> <p>2.1.2 (B) Steel Conduit Connection: Connections between steel conduits shall be with screwed couplers ensuring screwed metal to metal contact. Length of the threads in all cases of joints shall be between 13 to 19 mm. Connections between screwed conduits & sheet metal boxes shall be by means MS hexagon check nuts fixed inside the box. Joints in conduit and termination shall be free of burrs to avoid damage to insulation of conductors while pulling through the conduits.</p> <p>2.1.3 (B) Conduit Bends: Conduit bends shall of 16 SWG. As far as possible the conduit system shall be so laid out that it will alleviate the use of tees, elbows and sharp bends. Bending of conduit with large radius while laying at site to minimize use of readymade bends shall be adopted as far as possible. No length of conduit</p>		
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<p>shall have more than the equivalent of two-quarter bends from inlet to outlet.</p> <p>2.1.4 (B) Conduit Cross Section / Size: The conduit shall be of ample section area to facilitate the drawing of PVC wires/cables. In no case shall the total cross section of wires/cables measured overall, be more than half the inside area of the conduits. Refer Table provided at Clause No. 13, Page IV-48 for maximum no. of wires that can be pulled in various sizes of conduits.</p> <p>MINIMUM CONDUIT DIA (O.D.) FOR ELECTRICAL WIRING - 25 MM</p> <p>2.2 Laying of Conduits</p> <p>2.2.1 Conduits shall be laid before casting in the upper portion of a slab/in PCC if below flooring or otherwise, as may be instructed in accordance with approved drawings, so as to conceal the entire run of conduits and ceiling outlet boxes with a concrete cover of minimum 12 mm. Conduits shall be so laid that they are interconnected. This is required to facilitate pulling of wires from different routes in case of any of the portion of conduit/junction box/outlet box is blocked during slab casting. Vertical drops shall be cut in masonry work by the contractor to sufficient depth to allow full thickness of plaster over conduits. The width of the chases will be made to accommodate the required number of conduits. The chases will be filled with cement, coarse sand mortar (1:4) and properly cured by watering by the contractor. This filling of chases shall be done by electrical contractor prior to building contractor doing finishing plaster on walls.</p> <p>2.2.2 When the conduit is to be embedded in a concrete member it shall be adequately tied by steel wires to the reinforcement to prevent displacement during casting/vibrating of concrete. Tying wire shall be supplied by the contractor. Conduit in chases or laid in the slab shall be supported at maximum of 1 m centre.</p> <p>2.2.3 Cutting of chases in any R.C.C. member/finished floor/ already finished wall surface is not allowed unless prior approval of Site Engineer is taken in site instruction book. If a chase is cut in an already finished surface, the contractor shall fill the chases and finish it to match the existing finish including painting at his cost to Site Engineer's satisfaction.</p>		
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2.2.4	Contractor shall not cut any steel reinforcement bars or steel structure to fix the conduits. Puncturing of wooden/ steel shuttering for R.C.C. slab/beams/column etc. for conduit work is also not allowed, unless Site Engineer permits in site instruction book under special conditions.	
2.2.5	Run of conduit pipe through expansion joints in R.C.C. members should be avoided as far as possible and if unavoidable, flexible conduit pipe should be used with ceiling outlet box on both sides of expansion joint.	
2.2.6	<p>Surface Conduiting : Conduit on surface of walls/R.C.C. members shall be avoided as far as possible and if unavoidable prior approval of Site Engineer on sample saddles, clamps, screws and a minimum 5 M conduit laid on surface shall be taken, to achieve best possible workmanship. Distance between 2 consecutive clamps for fixing conduit on surface shall not exceed 600 mm. No wooden gutties for fixing saddles/clamps shall be used. Roll plug/steel fastener with hard setting/sealing compound shall be used. Conduits & boxes fixed on surface shall be painted with finishing paint of approved colour & finish.</p> <p>WHERE EVER FALSE CEILING IS BEING PROVIDED, CONCEALED CONDUITS IN RCC SLAB SHALL NOT BE PROVIDED BUT SURFACE CONDUITING WITH MS SUPPORTS / CLAMPS ETC. SHALL BE DONE OVER FLASE CEILING. SIMILARLY FOR INSULATED CEILING & WALLS, ONLY SURFACE CONDUITING TO BE PROVIDED.</p>	
2.2.7	Conduiting on Stone wall: In case of stone masonry, necessary conduits with MS boxes should be placed as the masonry is in progress, since after completing masonry; it is very difficult to cut chases in walls. Special location of cement concrete shaft is also recommended to conceal conduit in stone masonry and the same shall be provided by the IDMC.	
2.2.8	Conduits below floor: In ground floor conduiting below the flooring should be avoided. Wherever it is unavoidable GI 'A' class pipe or heavy gauge PVC pipe shall be used with prior approval of Site Engineer.	
2.2.9	Steel draw wires : All conduits shall be provided with steel draw wires (fish wires) of at least 16 SWG wherever required.	
2.3	Ceiling/Wall outlet boxes for lights/fans	
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<p>2.3.1</p> <p>2.3.2</p> <p>2.3.3</p> <p>2.4</p>	<p>Outlet boxes shall be of minimum 16 SWG steel sheets or of casting with removeable cover sheet for all the light points & the fan points and so installed as to maintain continuity throughout. These shall be protected at the time of laying by filling with jute/earth/cotton etc. so that no cement mortar finds its way inside during concreting or plastering etc. Typical sketches SK – 18 A & B for such outlet boxes are attached. While installing lighting fixture and ceiling fans, removeable covers to be removed and 3 mm thick matching colour hylem sheet covers to be used.</p> <p>For fixing lighting fixtures/brackets, outlet boxes complete with check nut for holding conduits shall be used. For fixing lighting fixture suitable for 14 /18 /20 Watts fluorescent tubes/ incandescent lamps/discharge lamps on RCC slabs/walls, only one outlet box is required. For fixing lighting fixture suitable for 28/ 36 / 40 / 54 Watts fluorescent lamps in RCC slabs/walls, two numbers outlet boxes should be provided at a distance of 300 mm away from the centre in the longitudinal direction of the fixture, so that the use of gutties / rawl plugs etc. may be avoided, as well as wiring from outlet box to the light fitting is completely concealed. However, if for fixing of lighting fixture suitable for 28/36/40/54 W fluorescent lamp in RCC slab walls, 2 nos. anchor fasteners are being used, only one outlet box may be provided. If the light fitting is to be installed in RCC beam, and due to heavy reinforcement at the bottom of beam it is not possible to provide outlet boxes, simple conduit should be provided. These details have been shown in the attached sketch no. SK-16 and these should always be followed.</p> <p>For fixing ceiling fans, circular outlet boxes, made of minimum 14 SWG Sheet Steel, 125 mm diameter, complete with 12 mm dia Mild Steel rod 525 mm long, with loop in the box & hylem sheet cover 150 mm dia at bottom shall be used/ for Readymade PVC Ceiling fan outlet box See attached sketch no. SK - 17 for the details of this special outlet box and fan fixing detail. However, if anchor fasteners with D-hook specially designed for fixing ceiling fans are used, simple outlet box without mild steel rod shall be used .</p> <p>Draw Out Junction Boxes Heavy gauge PVC / Steel draw out boxes fabricated from minimum 16 SWG sheet steel of ample dimensions shall be</p>	
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<p>provided at convenient points on walls/ceilings to facilitate pulling of long runs of cables/wires. These shall be completely concealed with 3 mm thick hylem sheet covers, flush with plasterwork. These draw out boxes should be five sided. The location of these boxes is to be decided prior to fixing, as per site requirement and following shall be treated as general guidelines for deciding the location of these:</p> <ol style="list-style-type: none"> These shall be provided at a place where these are not in direct view. Recommended place is 400 / 450 mm below ceiling, if conduits are running vertically. Junction boxes in the offset of bottom of R.C.C. beamed vertical wall shall not be provided. If junction boxes are coming side by side for two or more conduits, one common MS box of proper size can be used to act as junction box. Junction box in ceiling to be avoided as far as possible & if junction box is to be provided in ceiling, its position should be so located that it is in line with other light/fan points. Junction boxes shall never be used for splitting one conduit into two or more. Junction box for such functions is avoidable and for this, number of conduits to be connected to one switchboard shall be calculated correctly as per drawing before laying conduits in ceiling. Locating junction boxes on outer surface of exterior walls of building shall be avoided as these are in direct view and are also exposed to weather. Junction boxes shall never be closed permanently by plaster. Removable covering of Aluminium / Sheet Steel shall be provided for conduit boxes acting as junction boxes and for MS junction boxes removable hylem (white colour) plate shall be provided. This cover shall be painted with wall colour. Junction boxes in important areas shall be avoided and can be located in toilets/corridors/service shafts & stores etc. <p>2.5 A Switch Boxes (for Piano type switches)</p> <p>Steel boxes of required sizes fabricated from 16 SWG steel sheets, shall be provided to house speed regulators of fans, switches for lights, fans, plug sockets etc. as per requirement of drawings. These should be so designed that accessories on hylem sheet could</p>		
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<p>be mounted with tapped holes and brass machine screws, leaving ample space at the back and on the sides for accommodating wires and check nuts at conduit entries. These shall be attached to conduits by means of check nuts on all walls of the boxes through which the conduits are entering. These shall be completely concealed leaving edges flush with finished wall surfaces. 3 mm thick hylem cover should be fixed to these switch boxes by means of brass chrome plated machine screws. Utmost care shall be taken by contractor to ensure that all switch boxes are in line and level. Inside each switchbox, one bolt shall be welded to receive earthing wire.</p> <p>TYPICAL SKETCHES FOR THESE SWITCHBOXES ARE SHOWN IN THE ATTACHED SKETCH NO. SK-19. UNLESS OTHERWISE SPECIFIED IN EXECUTION DRAWINGS, THE HEIGHT OF SWITCH BOXES, OUTLET BOXES FOR LIGHTS IN WALLS, POWER PLUGS ETC. FROM FINISH FLOOR LEVEL SHALL BE AS SHOWN IN SKETCH NO. 20 (ATTACHED).</p> <p>2.5 B Switch Boxes (for Modular type switches)</p> <p>Same as above but only Zinc chromate passivated MS boxes suitable to house modular type switches, fan regulators & sockets of required ratings. These shall be so designed that accessories are mounted on a grid plate with tapped holes for brass machine screws. The grid plates & MS boxes shall be fitted with a brass earth terminal. Moulded front covers made from high impact resistant, flame retardant and ultra violet stabilized engineering plastics shall be fixed by means of counter sunk chromium plated brass machine screws.</p> <p>NOTE-</p> <p>CONVENTIONAL PIANO TYPE OR MODULAR SWITCHES AND CORRESPONDING SWITCH BOXES SHALL BE USED AT LOCATIONS AND AS PER THE DETAIL SPECIFIED IN SCHEDULE OF QUANTITIES/ DRAWINGS/ INSTRUCTION OF SITE ENGINEER.</p> <p>2.6 Cleaning and Protection of Conduit System</p> <p>The entire conduit system including outlet boxes, junction boxes and switchboxes shall be thoroughly cleaned after completion of erection and tested for non-blockage by air/sound or steel wire (minimum 16 gauge) prior to finishing of building and before drawing in of cables/wires.</p>		
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<p>To safe guard conduit system against filling up with the plaster/cement slurry/water etc. all the outlet and switch boxes will have to be provided with temporary jute/cotton filling, covers and plugs etc. within tendered cost which shall be replaced later on by hylem sheet cover after wiring as required.</p> <p>2.7 Painting of MS Outlet & switch boxes</p> <p>All outlet & switch boxes etc. should have their original finish & paint in good finish prior to erection & if due to long storage in open, painting has been peeled off/damaged/worn-out; fresh coat of paint should be applied.</p> <p>2.8 Raceways</p> <p>These shall be used for drawing wiring for system like UPS, telephone, data processing etc. specially under floors or above false ceiling, due to use of modular furniture. Heavy-duty removable cover raceways of sizes as per schedule of quantities/ drawings fabricated from 14 SWG sheet of approved design and make shall be provided. The raceways shall be embedded in floors, with covers flush with finished floor level or shall be fixed on surface over false ceiling, as indicated in drawings and as required. Covers of raceways shall be screwed on neoprene gasketed top with counter sunk brass chrome plated screws. Sheet steel raceways shall be galvanised. Fixing of raceways in floors shall be done in close co-ordination with civil works & utmost care shall be taken to prevent mortar from seepage into the raceways. These raceways be provided when floors are being laid. If these have to be provided after laying of floors, cost of cutting chases in floor and making them good, as required shall be without any extra cost. All telephone & data raceways shall be at least 300 mm away from those of electrical unless otherwise stated</p> <p>/ shown in drawings. Common raceways with steel partition can be used (with approval) for power and telephone data purpose.</p> <p>3.0 WIRING AND SWITCHES:</p> <p>3.1 Specification of wires, sizes and laying / termination.</p> <p>All wires shall have been manufactured in accordance with the latest IS Specification (IS 694-1990 Part II). All wires shall be PVC insulated, unsheathed, single core, FRLS (Fire Resistance Low Smoke), copper conductor (stranded), of 1100 volt grade. Cross section of the conductor shall be as per the specification mentioned in schedule of quantities.</p>		
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<p style="text-align: center;">MINIMUM CROSS SECTION OF COPPER STRANDED CONDUCTOR FOR ELECTRICAL WIRING - 1.5 MM SQUARE.</p> <p>For single phase wiring, colour of live conductor's insulation shall be Red/Yellow/Blue (only one of these colour for one building) and Black for neutral. Earthing is to be done by green PVC insulated copper conductor. For three phase wiring, colour of live conductor's insulation shall be Red/Yellow/Blue, as per relevant phase and black for neutral. However, if due to unavoidable circumstances, these colour codes cannot be used by contractor, prior approval of the Site Engineer shall be taken and correct colour PVC tape should be put in distribution board/ outlet boxes/switch boxes etc. wherever these wires are to be inspected. Earth wire shall always be of Copper conductor PVC insulated & colour of insulation shall be Green. Whenever wires are being terminated in a Distribution Board / Switch Box / Plug Points / Outlet Box etc., a minimum of 200-mm long extra wire should be provided in the form of a loop for future maintenance/use. Conductor having nominal cross sectional area exceeding 4 Sq. mm. Shall always be provided with crimping socket unless switchgear is having facility to receive direct naked wires.</p> <p><i>NO JOINTS IN WIRES SHALL BE MADE INSIDE CONDUITS AND INSPECTION DRAWOUT BOXES.</i></p> <p>3.2 A Switches And Sockets (Conventional piano key type)</p> <p>All 6 and 16 Ampere switches shall be conventional piano key type 240 volts AC of best quality & standard. The switch's moving & fixed contacts shall be of silver nickel and silver graphite alloy & contact tips coated with silver switches controlling the light, fan or sockets shall be connected on to the phase wire of the circuit. 6 A socket shall be 3-pin type with safety shutter, suitable for 240 V AC, 16 A socket shall be universal type (6 pins) suitable for 240 V AC with safety shutter.</p> <p>3.2 B SWITCHES AND SOCKETS (Modular type)</p> <p>All 10 & 20 A switches shall be of the modular flush mounting type, 240 V AC of best quality & standard. The switch's moving & fixed contacts shall be of silver nickel & silver graphite alloy & contact tips coated with silver. Housing of switches shall be made from high impact resistant, flame retarding & ultra violet stabilized engineering plastic material. Fan regulators shall be fixed inside</p> <p>the switch boxes on grid plates with tapered holes & brass</p>		
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<p>machine screws leaving ample space at the back & sides for accommodating wires. Switches & sockets shall be provided with moulded cover plates of approved colour, shape & size made from high impact resistant, flame retarding & ultra violet stabilized engineering Plastic material & secure the box with counter sunk / round head chromium plated brass screws, where two or more switches are installed together, they shall be provided with one common switch cover plate as described above with notches to accommodate all switches either in one, two or three rows. 10 /20 A socket outlets shall be of modular flush mounting type & shall be switch three pin type (for 10 A) and 6 pin type (for 20 A) and fitted with automatic linear safety shutters to ensure safety from putting fingers. Socket outlets shall be made from high impact, flame retarding & ultra violet stabilized engineering plastic material. Switch & sockets shall be located in the same plate.</p> <p>3.3 Point wiring</p> <p>3.3.1 For lights, fans, call bells & 10 A plug points in lighting switch boards</p> <p>(a) Providing & fixing of conduit, conduit accessories, draw out boxes, outlet boxes and switch boxes etc. in concealed / surface system.</p> <p>(b) Looping system shall be adopted from terminal to terminal throughout including supply and drawing of required numbers and sizes (minimum 1.5 sq. mm copper stranded conductor) of wires without stripping off the insulation in-between.</p> <p>(c) All flush type switches and accessories will be used on 3 mm thick hylem sheet in MS switch box or modular switches in special boxes as per technical specifications & requirement given in schedule of quantities.</p> <p>(d) The point will commence from the switch box and would end up to outlet box and shall also include supply and fixing of 6 A switch for each light point or group of light points as the case may be for the items.</p> <p>(CIRCUIT WIRING INCLUDING CONDUITING UP TO SWITCH BOARDS IS NOT INCLUDED IN SCOPE OF POINT WIRING)</p> <p>(e) POINT WIRING AND CIRCUIT WIRING IN SAME CONDUIT IS NOT ALLOWED AND THESE SHOULD BE DRAWN IN INDEPENDENT CONDUITS. POINT WIRING ORIGINATING FROM TWO</p>		
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<p>DIFFERENT PHASES SHALL NOT BE RUN IN THE SAME CONDUIT.</p> <p>(f) The ceiling fan point shall be complete with special outlet box as specified in 2.3.3. including fixing and connection of regulator. Supply and fixing of 6A switch and electronic stepped fan regulator for each ceiling fan is included in scope of the contractor. Switch box for ceiling fan shall be suitable for electronic type regulators unless otherwise specified.</p> <p>(g) For exhaust fans, ceiling rose near exhaust fan to be provided.</p> <p>(h) In any switch box, not more than six (6) regulators for ceiling fans should be provided unless approved in writing by the Site Engineer.</p> <p>(i) Joining of wires by taping inside the switch box to be avoided by utilizing neutral & phase pin of 6/10, 16/20, 6/16, 10/20, 25 A socket or of suitable capacity connector if there is no socket in switch box.</p> <p>(j) Fan regulator in switch box should be earthed if it is chocked or resistance type. Earthing of light fittings / call bells / fans not required. 10 Amp. convenience plug point's 3rd pin to be earthed with 2.5 sq. mm. green PVC insulated copper wire.</p> <p>(k) In one switch box, only one phase circuit shall be provided.</p> <p>(l) BUILDING FOR POINT WIRING (LIGHTS, FANS, CALL BELLS AND 10 A PLUG POINTS N LIGHTING SWITCH BOARDS) SHALL BE TWO TYPES :</p> <p>TYPE A - NON INDUSTRIAL BUILDING SUCH AS RESIDENTIAL QUARTERS, OFFICE BUILDINGS, HOSTLES, MARKETING SHOPS/MILK BOOTHS AND GUEST HOUSES ETC.</p> <p>TYPE B - INDUSTRIAL BUILDINGS SUCH AS PRODUCTION BLOCK, SERVICE BLOCK, SUB-STATION, REF. BLOCK, BOILER HOUSE AND WORKSHOP ETC.</p> <p>3.3.2 For 20/25 A Power Plug Points</p> <p>(a) Providing & Fixing of conduit, conduit accessories, draw out boxes switch boxes etc. in concealed/surface system including supply and drawing of circuit wiring. Conduit and wiring up to power plug point shall be paid separately and is not including</p> <p>in the scope of work for supplying & fixing power plug point.</p>		
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<p>(b) Providing and drawing of wires of sizes as specified in the item. In one circuit, there shall not be more than 2 nos. 20/25 A power plug points and circuit shall be 2 x 2.5/4.0 sq. mm copper stranded conductor wires, as specified in schedule of quantities.</p> <p>(c) One no. flush type plug socket outlet and switch shall be supplied and fixed for each power point on 3 mm thick hylem sheet cover. Plug socket shall be universal type (one common 20 A switch for 10/20 or 10/25 A sockets). 6-pin switch & socket to be piano type in conventional MS box or modular type in special MS box as required in schedule of quantities.</p> <p>(d) The point would commence from the distribution board and will end up to the switch box. Looping of circuit would be done to second 20/25 A power point from first 20/25 A power point.</p> <p>(e) Each circuit would have its own 2.5/4.0 sq. mm. green PVC insulated copper wire from distribution board to switch box and would be connected to third pin of socket outlet.</p> <p>(f) For some special 20/25 A power plug point, only one point on one circuit has to be provided as required in schedule of quantities/drawings.</p> <p>Note : Conduit and wiring up to 20 / 25 A power plug point from DB shall be paid under circuit wiring on length basis and supplying fixing of MS box with switch & socket shall be paid on number basis for each point.</p> <p>3.3.3 For 20 / 25 A Power Plug Point</p> <p>(a) Providing and fixing of conduit, conduit accessories, draw out boxes & switch box etc. in concealed/surface system.</p> <p>(b) Providing and drawing of wires of sizes as specified in the item. In one circuit, there shall be only one power point and circuit shall be 2 x 4.0 sq. mm copper stranded conductor wire as specified in schedule of quantities, complete with 4.0 mm sq. green PVC insulated copper wire.</p> <p>(c) One no. M.C.B. 20 / 25 A, single phase shall be fixed for each power point on 3-mm thick hylem sheet cover, in such a way that only knob is outside MS switch box. It should also have one no. 20/25 A three-pin metallic type socket outlet complete with metallic plug top if specified in schedule of quantities.</p>		
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<p>However, for modular socket & MCB grid & switch plate with special MS box shall be provided.</p> <p>(d) The point would commence from the distribution board and will end up to the switch box.</p> <p>Note : Conduit and wiring up to 20/25 A power plug point from DB shall be paid under circuit wiring on length basis and supplying fixing of MS box with switch & socket shall be paid on number basis for each point.</p> <p>3.4 Group Wiring (for industrial lighting)</p> <p>(a) Specification for this would be applicable if either 1 or more lights of total 200 Watts or more lighting load is controlled by one M.C.B.</p> <p>(b) Lights would be controlled by M.C.B. of rating and wire size, as specified in schedule of quantities. However, it shall not be less than 10 A and 2.5 sq.mm copper conductor respectively. Light points controlled by one M.C.B. would be in parallel.</p> <p>(c) M.C.B. for these lights would be installed in a suitable modular MS box with modular grid & switch plate. Total electric load to be controlled from this "Group Lighting Board" would not exceed 3000 W or 6 groups of lights.</p> <p>(d) 'Group Lights' point would commence from group lighting switch board in surface / concealed conduit system, necessary wiring and up to the last light of the group.</p> <p>(e) Group light points having fluorescent lamps light fittings with total wattage up to 500 W or less should be covered under the item 81.36 to 81.38. For discharge lamp type light fittings if total wattage is more than 150 but less than 750 watts it should be covered under the item no. 81.32 to 81.35 of library of schedule of quantities. However, if wattage of each point is above 500 W, each fitting may be controlled by independent MCB under item no. 81.33 of library of schedule of quantities.</p> <p>3.5 Circuit / Sub Mains Wiring</p> <p>3.5.1 Circuit wiring with PVC insulated wires</p> <p>Specification for this item covers, PVC insulated wires from distribution boards to light switchboard or to Group lighting switchboard, or to 10/20/25 A isolated power plug points, in surface/concealed conduit system. This shall also cover wiring</p>		
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<p>between two light switchboards or between two group lighting switchboards or between Two 10 /20 /25 / 30 A power plug points. This shall be carried out as follows:</p> <p>(a) Supply and fixing of conduit, conduit accessories, draw out boxes, etc. in concealed/surface system as per specification given in 2.0.</p> <p>(b) Providing and drawing of wires of sizes as specified in items details specified in schedule of quantities. For each circuit, independent conduit of size as specified in schedule of quantities to be provided i.e., pulling of more than one circuit in one conduit is not allowed. However, this condition can be relaxed by Site Engineer as per site conditions. In such cases one circuit shall be paid as per the relevant circuit wiring item and wires for other circuits shall be paid in items of pulling wires in existing conduits. Specification of wires shall be as per details given at 3.1.</p> <p>(c) Each circuit shall have a parallel independent running earthing of green PVC insulated copper stranded conductor wire of sizes as specified in schedule of quantities. For single-phase (2 wires) circuit one earthing wire and for 3 phase (4 wires) circuit, 2 earthing wire shall be drawn.</p> <p>(d) For the purpose of determining the load per circuit, the following electric rating of points shall be assumed:</p> <table><tr><td>Light points (4' Fluorescent lamp)</td><td>80 Watts</td></tr><tr><td>Light points (incandescent lamp)</td><td>60 Watts</td></tr><tr><td>Light points (Compact Flu. lamp)</td><td>20 Watts</td></tr><tr><td>Light points (Discharge lamps)</td><td>As per the load of the fitting</td></tr><tr><td>Call bell point</td><td>20 Watts</td></tr><tr><td>Convenience plug point 10 A</td><td>100 Watts</td></tr><tr><td>Fan points</td><td>60 Watts</td></tr><tr><td>Exhaust fan points</td><td>300 Watts or as specified.</td></tr><tr><td>Convenience plug point 20/25 A</td><td>1000 Watts</td></tr></table> <p>Type and size of circuit shall be specified in the drawings. However, if this is not specified the same may be worked out based on following guidelines:</p>			Light points (4' Fluorescent lamp)	80 Watts	Light points (incandescent lamp)	60 Watts	Light points (Compact Flu. lamp)	20 Watts	Light points (Discharge lamps)	As per the load of the fitting	Call bell point	20 Watts	Convenience plug point 10 A	100 Watts	Fan points	60 Watts	Exhaust fan points	300 Watts or as specified.	Convenience plug point 20/25 A	1000 Watts
Light points (4' Fluorescent lamp)	80 Watts																			
Light points (incandescent lamp)	60 Watts																			
Light points (Compact Flu. lamp)	20 Watts																			
Light points (Discharge lamps)	As per the load of the fitting																			
Call bell point	20 Watts																			
Convenience plug point 10 A	100 Watts																			
Fan points	60 Watts																			
Exhaust fan points	300 Watts or as specified.																			
Convenience plug point 20/25 A	1000 Watts																			
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<p>1. For non-industrial buildings such as office building, worker's amenity, staff quarters etc. the load per lighting circuit (light points, fan points & 10 A socket outlet) shall not exceed 1000 W or a total of 10 lights, fan or socket points which ever is less and hence circuit of 2.5 sq. mm copper conductor wire may be used.</p> <p>2. For industrial buildings load per lighting circuit can be more than 1000 W. Size of copper conductor wire for circuit may be For load up to 1500 W : 2.5 sq.mm circuit For load above 1500 & up to 2000 W : 4.0 sq.mm circuit For load above 2000 & up to 3000 W : 6.0 sq.mm circuit For load more than 3000 W : 10 sq. mm circuit For Industrial Building depending upon the load 3 phase circuits of 4.0 & 6.0 sq.mm can also be used.</p> <p>3. For 20/25 A power plug points circuit wiring of min. size 2.5 sq. mm copper conductor to be used. Maximum two 20 A power plugs points can be provided in one power circuit.</p> <p>3.5.2 Sub-Main Wiring with PVC insulated wires Specification for this item covers, PVC insulated wires/cables from main switch board to distribution board or from one distribution board to other distribution board in surface/concealed conduit system. This shall be carried out as specified in 3.5.1.</p> <p>3.5.3 Sub-Main Wiring with PVC insulated, PVC sheathed armoured cables. Same as 3.5.1 above except that PVC insulated, PVC outer & inner sheath, armoured, Al. conductor cables shall be used instead of PVC insulated wire/cable. These cables shall be supplied & laid as specified in 4.0 of tender' technical specification.</p> <p>4.0 POWER CABLE WORK</p> <p>4.1 Specification of Cables Heavy duty, PVC insulated, PVC outer and inner sheath, steel armoured, Al. conductor cables suitable for 1100 Volts AC, as per IS 1554 (Part-I-1976) of sizes as specified in schedule of quantities. The conductor of cable of size 16 sq. mm. & above shall be stranded whereas cables of size up to 10 sq. mm. shall be of single strand. While deciding the sizes of cable (if not specified in</p>		
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<p>drawings) for current rating following conditions may be considered</p> <p>a) Maximum conductor 70 deg. C Temperature</p> <p>b) Ambient Air Temperature 45 deg. C.</p> <p>c) Ground Temperature 30 deg. C</p> <p>d) Depth of Laying 750 mm.</p> <p>e) Load Maximum connected load</p> <p>f) Grouping of cable Yes</p> <p>g) Voltage drop Not to exceed 5% from one end to another end</p> <p>4.2 General Precautions for handling of cables</p> <p>4.2.1 Before laying cables, these shall be tested for physical damage, continuity, absence of cross phasing, insulation resistance to earth and between conductors. Insulation resistance tests shall be carried out with 500/1000-Volt Insulation Tester.</p> <p>4.2.2 The cables shall be supplied to site wound on wooden drum as far as possible. For smaller length and sizes, cable in properly coiled form can be accepted. The cables shall be laid by mounting the drum of the cable on drum carriage (specially for cable of sizes above 50 sq. mm.). Where the carriage is not available, the drum shall be mounted on a properly supported axle, and the cable laid out from the top of the drum. In no case the cable will be rolled on, as it produces kinks which may damage the conductor.</p> <p>4.2.3 Sharp bending and kinking of cables shall be avoided. The bending radius for PVC insulated and sheath armoured cable shall not be less than 12 D where 'D' is overall dia of the cable.</p> <p>4.2.4 While drawing cables through GI pipes and conduits & RCC pipe, ensure that size of pipe is such that, after drawing cables, 40% area is free. After drawing cable, the end of GI pipes/conduits shall be sealed with cotton/bituminous compound. After drawing cables through RCC pipes, the ends shall be sealed with lean mortar of brickbat.</p> <p>4.2.5 Electric power cables and telephone wires/cables shall not be laid in same trench, G.I./conduit/R.C.C. pipe. Minimum distance of</p>		
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<p>400 mm between power and telephone wire/cable shall be maintained.</p> <p>4.2.6 Armoured cables shall never be concealed in walls / floor/ roads without GI pipes, conduit or R.C.C. pipes.</p> <p>4.3 Laying of Cables (Underground System)</p> <p>4.3.1 Cables shall be so laid in ground that these will not interfere with other underground structures. All water pipes, sewage lines or other structure which become exposed by excavation shall be properly supported and protected from injury until the filling has been rammed solidly in places under and around them. Any telephone or other cables coming in the way are to be properly shielded, diverted as directed by the Site Engineer.</p> <p>4.3.2 Cables shall be laid at a minimum depth of 750 mm from existing ground level. Excavation will generally be in ordinary alluvial soil. The width of the trench shall be sufficient for laying of required number of cables.</p> <p>4.3.3 Sand bedding 75 mm thick shall be made below and above the cables. A layer of second class bricks (full size 230 x 100 x 75 mm) shall be laid over the cable, above sand bedding to cover cable completely. More than one cable can be laid in the same trench by providing sand between two cables. For details of laying of cables see sketch no. SK-26 attached. However, the relative location of cables in trench shall be maintained till termination. The surface of the ground after back filling the earth shall be made good so as to conform in all respects to the surrounded ground and to the entire satisfaction to Site Engineer.</p> <p>4.3.4 Cable Joints: Joints in the cable throughout its length of laying shall be avoided as far as possible and if unavoidable, prior approval of site engineer shall be taken. If allowed proper straight through epoxy joint shall be made including preparing necessary bedding without any additional cost.</p> <p>4.3.5 Cable Loops : A minimum loop of 3 M shall be provided on both ends of the cable at entry of buildings, or after every 150 M of un-jointed length of cable, and on both ends of straight through cable joint. This additional length shall be used for fresh termination in future. Cable for this loop shall be paid for supply and laying.</p> <p>THE LOOP SHALL BE KEPT IN "S" FORM AND LOOPS OF DIFFERENT CABLES SHOULD NOT OVERLAP.</p>		
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4.3.6	<p>Route Markers</p> <p>For all underground cables, route markers should be used:</p> <p>(i) Separate cable route marker should be used for L.T., H.T. and Telephone cables.</p> <p>(ii) Standard specification of cable markers is as follow: Galvanised cast iron plate with marking (LT/HT/Telephone cable) dia 100 mm with 600 mm long GI 'B' class 20 mm pipe or 35 x 35 x 6 mm MS angle (Galvanized) riveted/bolted with this plate.</p> <p>(iii) Route markers should be grouted in ground with 1:2:4 cement concrete pedestal size: 230 x 230 x 300 mm.</p> <p>(iv) Cable markers should be installed at an interval not exceeding 50 M along the straight routes of cables at a distance of 0.5 M away from centre of cable with the arrow marked on the cable markers plate indicating the location of cable. Cable markers should also be used to identify change in direction of cable route and for location of every joint in underground cable. The typical sketch of a cable marker is shown in Sketch no. SK- 27 attached.</p>	
4.3.7	<p>R.C.C. hume pipe for crossing road in cable laying shall be provided by purchaser/Client. Similarly masonry/concrete trench inside building if required shall be provided by IDMC. However,</p> <p>`A' class GI pipes for laying cables in walls/floors/concrete block etc. near cable ends/if required shall be provided by contractor without any extra cost. Sealing of GI pipes/conduits, R.C.C. hume pipe, trenches etc. also shall be done by electrical contractor without any extra cost.</p>	
4.4	Laying of cables (in air)	
4.4.1	<p>If major length (more than 75 %) of cable is in air above ground & balance underground, full length would be considered laid in air whereas if major portion (more than 75%) is in the ground and part length is in air, full length would be considered in underground system.</p>	
4.4.2	<p>Cables in air shall be laid in GI `A' class pipes or on cable trays, as specified in schedule of quantities. Clamping of cables directly on wall surface shall not be allowed. Suitable aluminium clamps with aluminium cast saddles to be provided if GI pipes is laid on wall surface. For fixing cables on cable trays, Aluminium strip</p>	
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<p>clamp of minimum 2-mm thickness shall be used. Providing and fixing of MS supports for cable tray would be done by electrical contractor without any extra cost. However cable trays shall be paid extra.</p> <p>4.4.3 Clause no. 4.3.4, 4.3.5, 4.3.7 of underground cable system shall be applicable to cable in air system also.</p> <p>4.4.4 Cable Trays: These shall be perforated type, heavy duty, return flange or inward bend shape, manufactured from mild steel confirming to IS 226 and hot dip galvanized as per IS 2629 / BS 729. Width of cable Tray shall be as per the requirement. Height to be minimum 50 mm & thickness of plate to be 1.5 mm up to 300 mm cable tray width. For cable Trays having width more than 300 mm, height to be 75 mm & Thickness of plate to be 2.0 mm. Cable Trays to be supplied to site in standard length of 2.5 M. Necessary accessories of cable trays such as coupler side plates for joining cable trays, bends, outside riser, inside riser etc. to be provided. MS supports for cable trays and fixing of these supports to RCC roofs with anchors fasteners are included in scope of supply and installation.</p> <p>4.5 Termination & Jointing of Cables</p> <p>4.5.1 On both ends of cables suitable size brass chrome plated (CP) heavy duty, double compression type cable glands shall be used before it enters terminal box/main L.T. panel/distribution board/sub-distribution board/joint box/cable box etc. Armour of cable shall be connected to earth point.</p> <p>4.5.2 All the cores of PVC cables, of conductor size exceeding 4 sq. mm. shall be connected at the ends with the help of appropriate size and type of sockets/lugs. These sockets shall be of tinned copper or Aluminium alloy (socket material to be same as of cable conductor) and these shall be fitted on conductor by crimping process only with appropriate crimping tool. Following is the recommended procedure for crimped joint and the same shall be followed:</p> <p>(i) Strip off the insulation of the cable and with every precaution, not to severe or damage any strand. All insulations to be removed from the stripped portion of the conductor and ends of the insulation should be clean and square.</p>		
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<p>(ii) The cable should be kept clean as far as possible before assembling it with the terminal/socket. For preventing the ingress of moisture and possibility of re-oxidation after crimping of the Aluminium conductors, the socket should be fitted with corrosion inhibiting compound. This compound should also be applied over the stripped portion of the conductor and the palm surface of socket.</p> <p>(iii) Correct size and type of socket/ferrule/lug should be selected depending on size of conductor and type of connection to be made.</p> <p>(iv) Make the crimped joint by suitable crimping tool.</p> <p>(v) If after crimping the conductor in socket/lug, some portion of the conductor remains without insulation the same should be covered sufficiently with PVC tape.</p> <p>5.0 TELEPHONE, COMPUTER DATA AND TELEVISION WIRING</p> <p>5.1 Point Wiring for Telephone System</p> <p>(a) The point wiring shall be carried out with telephones wires/cables, 2 pair, un-armoured, PVC insulated and sheath, 0.51 mm dia annealed tinned copper conductor, conforming to ITD specification S/WS-113C armouring and outer sheath as per IS: 1554 (Part -I) in 25 mm PVC conduit (one pair always remaining spare for one point). If more than one telephone point has to be provided at one point, multi-core, un-armoured telephone cable shall be used (pairs required are equal to 2 x no. of points) in suitable size conduit. If specifically mentioned in schedule of quantities, instead of ordinary PVC insulated telephone wire as specified above, UTP cable Cat – 5 to be supplied & laid.</p> <p>The item includes providing and fixing/laying of conduit, switch boxes, socket for telephones connection and telephone wires/cables etc.</p> <p>MINIMUM DIAMETER OF PVC CONDUIT FOR TELEPHONE WIRING – 25 MM</p> <p>(b) The point shall commence from the main telephone tag box/sub tag box and would terminate at outlet box of point. Connection at both ends included in point wiring.</p> <p>(c) Steel conduit, accessories, draw out boxes, switch boxes etc. shall be supplied & laid as per the details given at 2.0.</p>		
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<p>(d) Each telephone point shall have 1 no. flush type RJ11 telephone jack fixed on 3 mm thick, hylem sheet in MS outlet box (size 100 x 100 mm). More than one telephone socket outlet (maximum 2 nos.) can be fixed on one outlet box, provided these points are at one place and multi-pair (more than 2 pair) telephone cable has been drawn to this point from tag box. However if specified in schedule of quantities, telephone cord grid plate mounted outlet unit (RJ – 11) with moulded cover plate in recessed galvanised MS box to be provided.</p> <p>(e) Joint in telephone wiring (between main tag box/sub tag box and outlet box of point) shall not be allowed and the contractor should bear the wastage of wire if resulted due to this special requirement of telephone system. No looping in telephone system is allowed unless specifically shown in the drawing or instructed by site engineer in the drawing/instruction book.</p> <p>(f) Telephone and computer data wiring can be drawn in the same conduit, provided after drawing wires, 50% of conduit cross sectional area is free. However independent PVC insulated telephone & data wire of suitable size shall be used for telephone and computer data.</p> <p>(g) To identify each pair of multi-pair telephone wire/cable, PVC indication numbers shall be put on both end of pair just before termination.</p> <p>5.2 Point Wiring (Computer Data)</p> <p>(a) The point wiring shall be carried out with data cable of 4 (FOUR) pairs (or as specified in schedule of quantities) un-armoured, PVC insulated and sheath, 0.50 mm dia annealed tinned copper conductor (CAT 5E or CAT 6 as specified in schedule of quantities), in suitable size conduit.</p> <p>The item includes providing and fixing/laying of conduit, switch boxes, socket for computer connection and data wires/cables etc</p> <p>MINIMUM DIA OF PVC CONDUIT FOR COMPUTER DATA WIRING - 25 MM.</p> <p>(b) The point shall commence from the main junction box or sub junction box at floor of computer data system, and would</p>		
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<p>terminate at outlet box of point. Connection at both ends of cable shall be carried out by purchaser.</p> <p>(c) General specification for concealed/surface conduit system of telephone system (clause no. 5.1 (c), 5.1 (d) & 5.1 (g) shall be applicable for this system also.</p> <p>(d) Joint in computer data cable (between junction box and outlet box of point) shall not be allowed and the contractor should bear the wastage of cable if resulted due to this special requirement of computer data system.</p> <p>5.3 Telephone Cable Work (Underground System)</p> <p>(a) The cable shall be suitable for telephone system of suitable pairs (as specified in schedule of quantities), steel armoured, PVC insulated and sheath, 0.51 mm dia annealed tinned copper conductor, conforming to ITD specification S/WS-113C armouring and outer sheath as per IS:1554 (Part-I). All telephone cables for underground laying shall be jelly filled type.</p> <p>(b) Specification for laying of telephone cable in underground system shall be same as for electrical system (clause nos. 4.2, 4.3, 4.4 and 4.5 and the same shall be followed.</p> <p>5.4 Telephone Tag Boxes</p> <p>These shall be of KRONE type using insulation displacement technique in which there is no stripping or soldering of wire, of MS sheet 14 G with connector suitable for telephone connection. It shall have hinged MS sheet cover. Tag box to be of sufficient size to not only accommodate required KRONES but also space for dressing of wires.</p> <p>5.5 Television Point Wiring</p> <p>(a) ONLY STEEL CONDUIT MINIMUM 25 MM DIA SHALL BE PROVIDED AND LAID FOR ALL TV WIRING. ALL SPECIFICATIONS FOR CONDUTING SHALL BE SAME AS MENTIONED AT 2.0.</p> <p>(b) Co-axial TV cable of single strand tinned copper conductor of diameter 0.80 mm, complete with metallic shield. Cable having signal loss less than 6 db per 100 Mts. for band 1 UHF should be provided and laid.</p> <p>(c) One number TV wall outlet in suitable MS box should be fixed at each receiving end.</p>		
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	<p>(d) In each 25 mm dia conduit max. 2 nos. co-axial cables should be drawn. There should be the least possible number of bends in the conduit system.</p> <p>(e) The samples of TV cable & wall outlet should be got approved before installing.</p> <p>(f) Matter to be checked by contractor with purchaser, whether system of each TV point having its own TV antenna is there for the project or cable TV system having common antenna for project is to be followed. This shall be specially applicable if in the project residential quarters are also included. If central cable TV system is their, necessary amplifier, tap-off, and splitters etc. to be provided as per detail drawings and schedule of quantities.</p>	
6.0	EARTHING & LIGHTENING PROTECTION SYSTEM	
6.1	Earth Pit	
	<p>(a) Plate or pipe type earth electrode with earth pit shall be provided for this work unless otherwise advised by site engineer due to typical site conditions. Earthing electrode and pit shall be as per IS 3043-1987, the latest revision (code of practices for Earthing). For ready reference, sketches for pipes and plate type earth electrode earthing pit have been shown in the attached sketch no. SK - 25. All earth electrodes shall preferably be driven to a sufficient depth to reach permanent moist soil.</p>	
	<p>PRIOR APPROVAL OF SITE ENGINEER SHALL BE TAKEN FOR SELECTING TYPE OF EARTH ELECTRODE (PIPE OR PLATE).</p>	
	<p>(b) Earth pit centre shall be at a minimum distance of 3 M from nearest building, unless otherwise advised. The minimum 3 M distance shall be maintained between centres of 2 earth pits.</p> <p>(c) Earth electrode for Neutral of transformer shall be of copper, whereas the same for all other application shall be of GI.</p>	
6.2	Earth Bus, Earthing Lead & Earth Wire/Strip	
	<p>(a) All single phase & three phase distribution boards, LT Panels shall be provided with two earth point from 2 independent earthing systems.</p> <p>(b) Bare round/flat sections of galvanised Iron or PVC insulated aluminium conductor wire of sizes as specified in schedule of quantities shall be used for taking out earthing from earth</p>	
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<p>electrodes, for making earthing bus or for connecting to LT panels/distribution board etc.</p> <p>(c) Heavy duty, PVC insulated, PVC outer and inner sheath armoured copper conductor cable suitable for 1100 Volts as per IS-1554 (PART -1 : 1976) of sizes in specified in schedule of quantities shall be used from earth electrode to concealed distribution board shall be laid underground. Specification 4.2, 4.3, 4.4 & 4.5 of handling and laying of power cable shall be applicable for this cable also.</p> <p>6.3 Lightning Protection System</p> <p>For lightning protective system IS 2309-1989 "Code of practice for the protection of building & allied structures against lightning" shall be followed.</p> <p>6.3.1 Lightning Arrestor/Vertical Air Termination</p> <p>Vertical air terminations shall comprise of finals made of 25-mm dia GI tube 1200 MM long with multiple spikes at the top. Vertical terminations when provided shall project at least 300 mm above the salient point or network on which it is fixed. Roof conductors/down conductor/GI strip as specified in schedule of quantities shall be fixed to base plate of this lightning arrestor. Lightning arrestor shall be fixed on highest point of the tallest building of the project. Numbers and building on which it has to be installed shall be shown in the drawings/ finalised by site engineer.</p> <p>6.3.2 Roof Conductors</p> <p>These shall be used as per drawings (if required) to interconnect the various lightning arrestors of one building near the top, to extend zone of protection. These shall be of GI strip of size 25x3 mm or as specified in schedule of quantities and shall be fastened securely to the building surface by means of GI saddles, maximum 1 m apart with GI nails/screws.</p> <p>6.3.3 Down Conductors</p> <p>These shall be used for connecting the lightning arrestors/roof conductors to earth electrode of earth pit. Structures with a base area of up to 90 sq. m may if the height of the lightning arrestor gives sufficient protection, be equipped with one down conductor only. These shall be of GI strip size 25 x 6 mm or as specified in</p>		
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<p>schedule of quantities fastened securely to the building surface by means of GI saddles, maximum 1 m apart with GI nails/screws. Each down/conductor shall have its own independent earth pit.</p> <p>6.3.4 General</p> <p>The lightning protective system shall have as few joints as possible and they shall be mechanically and electrically effective. In general, joints for strips shall be tinned, soldered and at least double riveted. Bolted joints shall only be used on test points or on bonds to existing metals. Each down conductor shall be provided with a testing joint in a position convenient for testing but inaccessible for interference.</p> <p>All other metal objects such as water tanks, iron staircase/railings, water or gas pipes on top of, inside or by the side of a building should be at least 2 m away from the lightning roof conductor/down conductor system. If this is not possible they should be provided with a separate down conductor and earth pit.</p> <p>Structures with explosive or inflammable contents shall not have any spire, flagstaff or other salient point, which can impair the efficiency of air termination/lightning arrestor. No outdoor radio aerials or overhead line poles may be located within a distance of 15m from the structure. Special instructions for earthing system:</p> <ul style="list-style-type: none"> a) EARTHING SYSTEM USED FOR LIGHTNING PROTECTION MUST BE INDEPENDENT OF THE EQUIPMENT/ DISTRIBUTION EARTHING SYSTEM. b) EARTHING SYSTEM FOR TELEPHONE SYSTEM SHALL NOT BE MIXED WITH EQUIPMENT/DISTRIBUTION OR LIGHTNING EARTHING. c) EARTHING SYSTEM FOR COMPUTER SYSTEM SHALL NOT BE MIXED WITH OTHER EARTHING SYSTEMS. d) EARTHING SYSTEMS FOR UPS AND DG SETS SHALL NOT BE MIXED WITH OTHER EARTHING SYSTEMS. <p>7.0 SUPPLY & INSTALLATION OF LIGHTING FIXTURES/FANS</p> <p>7.1 Technical specifications of lighting fixtures/fans</p> <p>Lighting fixtures, fans and exhaust fans are generally not to be supplied by the contractor and hence the detail specifications of these are not being given here.</p>		
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<p>7.2 Installation of Lighting Fixtures</p> <p>7.2.1 Scope of work under this item shall start from light point, with a 6 A bakelite connector, 2 core 1.5 Sq. mm PVC insulated copper stranded conductor wires from this connector to the connector inside the lighting fixture, connections, fixing of lighting fixture complete with all accessories, lamps on wall/roof/steel truss etc. testing the lighting fixture and commissioning. If wire length of light point is enough to reach connector of light fitting, connector in light point can be deleted.</p> <p>7.2.2 If lighting fixtures are being supplied by Purchaser/Client, the contractor would take delivery of these from site store, test the same before installation and if found defective, the defect would be brought to the notice of site engineer. Repair of wiring/circuit of the fitting shall be carried out by contractor without any additional cost. However, if any component of the lighting fixture is defective/ damaged, the same would be located and brought to the notice of site engineer, who would arrange repair/procurement of the same. However, labour for replacement of the damaged/defective component of lighting fixture shall be done by contractor without any additional cost.</p> <p>7.2.3 Contractor shall clarify from site engineer for type of installation (direct on ceiling/hanging) of lighting fixture, if not specifically mentioned on drawings. Length of the suspension rods shall also be decided in consultation with site engineer.</p> <p>7.3 Installation of Ceiling Fans</p> <p>7.3.1 Scope of work under this item shall start from fan point with a 6 A bakelite connector, 2 core 1.5 Sq. mm PVC insulated copper stranded conductor wires from this connector to the connector fan, connections, fixing of fan (complete with all accessories) to the fan hook of fan point, testing the fan with regulator and commissioning.</p> <p>7.3.2 If ceiling fans are being supplied by Purchaser, the contractor would take delivery of these from site store, assemble the same, test before installation and if found defective, the defect would be brought to the notice of site engineer. If any component of fan is defective/damaged, the same shall be located and brought to the notice of site engineer, who would arrange repair/procurement of the same. However, labour for replacement of the</p>		
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<p>damaged/defective component of fan shall be done by contractor without any additional cost.</p> <p>7.3.3 Extension/replacement of hanging rod of fans shall be carried out only if advised by site engineer on drawing/site instruction book. Only GI pipe ('B' class) shall be used for ceiling fan hanging. Screwed joint within the length of fan hanging rod is not allowed and shall never be adopted. Fan hanging rod should be preferably of one piece and if not possible, welded joint can be allowed. This hanging rod shall be painted with enamel paint as directed.</p> <p>7.4 Installation of wall fans Specification same as 7.3 except that fan has to be fixed on wall with screws/bolts grouting instead of on fan hooks.</p> <p>7.5 Installation of Exhaust fans</p> <p>7.5.1 Scope of work under this item shall start from exhaust fan point, with a ceiling rose, 2 core 2.5 Sq. mm PVC insulated copper stranded conductor cable in flexible conduit from ceiling rose to connector of exhaust fan, connections, fixing of exhaust fan in existing opening, complete with accessories and louvers on walls with hold- fasts, testing the exhaust fans and commissioning.</p> <p>7.5.2 Same as 7.3.2 (read exhaust fan instead of ceiling fans).</p> <p>7.5.3 If instructed by Site Engineer, Electrical contractor shall make opening in wall for exhaust fan including repair and finishing of opening. Charges of this work shall be paid separately as per schedule of quantities.</p> <p>7.6 Special Notes</p> <p>7.6.1 Location of lighting fixtures/fans shall be shown on the working drawings and the same shall be followed. However, if due to site conditions the location can not be adhered to, the same shall be brought out to the notice of site engineer for advice.</p> <p>7.6.2 Maintenance & custody of light fixture/fans after installation/ commissioning would be with contractor till that building/area is completed and handed over to IDMC Site Engineer in satisfactory working order.</p> <p>8.0 STREET LIGHTING</p> <p>8.1 Street Light Poles Specification</p> <p>These shall be of hot dip galvanized polygonal/octagonal type with suitable arrangement at the top of the pole for</p>		
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<p>fixing the lighting fixture. The Material for Pole Shaft as per IS 5986 Grade - Fe 510 or Equivalent, Material for Base Plate - As per IS 2062 Grade -Fe 410, Metal protection - Hot Dip Galvanisation as per IS 4759 or equivalent, The minimum zinc coating required is 75 to 80 microns uniform thickness all around the surface of poles, brackets and foundation bolts. Poles will have one bracket arm/two brackets arm radially equidistant/three brackets arm radially equidistant as specified in schedule of quantities for fixing one/two/three lighting fixtures. Each pole would have in-built water tight box complete with a 4 way heavy duty 30 Amp. power connector, four way heavy duty 30 Amp neutral connector, 10 A SP MCB of 10 KA rupturing capacity and GI High tensile suitable size foundation bolts, Nuts washer etc. refer the attached drawing of street light poles. The earthing of each street light pole shall be carried out with PVC insulated black colour 10 Sq. mm (single core) Aluminium conductor cable, connected to perforated 38 mm NB GI 'B' class pipe 2.5 M long, driven in earth (150 mm dia pit filled with charcoal & salt). The pipe should have removable plug at top.</p> <p>DETAILS FOR HOT DIP GALVANIZED POLYGONAL / OCTAGONAL STREET LIGHT POLE SIZE 6.5 METER</p> <table> <tr> <td>H</td><td>Total Height</td><td>6.50 METER</td></tr> <tr> <td>T1</td><td>Sheet Thickness</td><td>3.5 MM</td></tr> <tr> <td>D</td><td>Door Opening</td><td>Standard</td></tr> <tr> <td>L</td><td>Foundation Bolts Length</td><td>600MM min.</td></tr> <tr> <td>D</td><td>Foundation Bolts Diameter</td><td>M20</td></tr> <tr> <td>N</td><td>No. Of Bolts</td><td>4</td></tr> <tr> <td>P</td><td>P.C.D. Of Bolts</td><td>250 MM</td></tr> <tr> <td>S</td><td>Size Of Base Plate</td><td>260 X 260 MM</td></tr> <tr> <td>T1</td><td>Thickness Of Base Plate</td><td>16 MM min.</td></tr> <tr> <td>BL</td><td>Length Of Bracket Arm</td><td>1.5 METER</td></tr> <tr> <td>TA/F</td><td>Top Across Flat (Out Side)</td><td>90 MM</td></tr> </table>			H	Total Height	6.50 METER	T1	Sheet Thickness	3.5 MM	D	Door Opening	Standard	L	Foundation Bolts Length	600MM min.	D	Foundation Bolts Diameter	M20	N	No. Of Bolts	4	P	P.C.D. Of Bolts	250 MM	S	Size Of Base Plate	260 X 260 MM	T1	Thickness Of Base Plate	16 MM min.	BL	Length Of Bracket Arm	1.5 METER	TA/F	Top Across Flat (Out Side)	90 MM
H	Total Height	6.50 METER																																	
T1	Sheet Thickness	3.5 MM																																	
D	Door Opening	Standard																																	
L	Foundation Bolts Length	600MM min.																																	
D	Foundation Bolts Diameter	M20																																	
N	No. Of Bolts	4																																	
P	P.C.D. Of Bolts	250 MM																																	
S	Size Of Base Plate	260 X 260 MM																																	
T1	Thickness Of Base Plate	16 MM min.																																	
BL	Length Of Bracket Arm	1.5 METER																																	
TA/F	Top Across Flat (Out Side)	90 MM																																	
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<p>BA/F Bottom Across Flat (Out Side) 160</p> <p>MM RCC Foundation nominal reinforcement steel (Min size 450X450X1500MM)</p>		
8.2	<p>Bracket for street light fittings on buildings - Specification</p> <p>The brackets shall be made of 38 mm NB MS class `B' pipe, approx. 1.8 M long, bent at the centre at an angle of 10 degree from horizontal, with necessary holding brackets, hold fasts etc. with special reducer at end to accommodate type of street light fitting to be fixed. Bracket shall have two coats of anti-corrosion Zinc chromate red-oxide primer before despatch to site and 2 coats of approved make and shade of enamel paint at site after installation. Each bracket to be provided with suitable MS flat clamps for fixing. Each bracket shall also be provided with one MS water tight switch box, complete with a 4 way connector, 4 way connector or neutral, 10 A SP MCB with 10 KA rupturing capacity etc. similar to box being provided for street light poles. See attached drawing of street light poles.</p>	
8.3	<p>Installation of poles</p> <p>Installation of poles shall be done as per attached drawing of street light poles. The erection of street light poles includes excavation, refilling and RCC 1:2:4 foundation with nominal reinforcement steel (Min size 450X450X1500MM) as per attached Drawing , The foundation bolts shall be grouted in RCC Foundation. Special care shall be taken in erecting poles so that these are not strained or damaged during erection and are firmly stayed. The cement concrete shall be protected from premature drying by curing for at least seven days after pouring. All concrete surfaces from 150 MM below ground level to top shall be finished smooth with cement mortar 1:4. The pole shall be installed only after foundation are secured. Before placement of concrete for pole foundation in the pit, necessary GI class A pipes (not less than 38 mm dia. NB) shall be placed for facilitating drawing of cables and earthing wire. Separate pipes shall be provided for incoming</p>	
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<p>and each outgoing cable. Nothing extra shall be paid for these GI pipes which are there to facilitate pulling of armoured cables & earthing wire, as cost of these are included in laying of cables.</p> <p>8.4 Installation of street light fixtures</p> <p>This includes fixing of street light fitting complete with accessories and lamps at the end of the pole/bracket, connecting it with 3 X</p> <p>2.5 Sq.mm Copper stranded conductor, PVC insulated, flexible cable from water tight MS switch box, testing & commissioning. One core of cable shall be connected with earthing point of light fitting at one end & earthing point of MS switch box at the other end. If the pole has more than one light fitting, each fitting should have independent flexible cable from MS switch box to fitting. While fixing streetlight fitting on bracket (8.2 above), supplying and fixing of necessary MS conduit between MS switch box and fitting is also included in contractor's scope without any extra cost.</p> <p>8.5 Installation of post top lantern</p> <p>8.5.1 For entrance gate</p> <p>This includes providing & fixing 65 mm NB MS class 'B' pipe of 0.5 M long and 25 mm dia MS 'B' class pipe with bend at lower end for pulling wire in brick/RCC column, including MS water tight switch box (specification same as that of street light pole) and installation of post top lantern complete with all accessories and lamp, connecting it with 3x2.5 Sq. mm copper stranded conductor, PVC insulated flexible cable, testing & commissioning. Painting of the exposed portion of the pipe with two coats of approved make & shade of enamel paint is also included. One conductor of flexible cable shall be used for earthing.</p> <p>8.5.2 For open ground</p> <p>This includes providing and fixing 65 mm dia MS class 'B' pipe of total length 3.5 M (including 750 mm in ground to be grouted with 300 x 300 x 1000 mm cement concrete 1:2:4) and water tight switch box (specification same as that of street light poles) installation of post top lantern complete with all accessories and lamp connecting it with 3 x 2.5 sq.mm copper stranded conductor, PVC insulated flexible cable, testing and</p>		
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<p>commissioning. Painting of exposed pipe length with 2 coats of approved make & shade of enamel paint is also included. One conductor of flexible cable shall be used for earthing.</p> <p>The earthing of each street light pole shall be carried out with PVC insulated black colour 10 Sq.mm Aluminium conductor (single core) cable, connected to perforated 38 mm NB GI 'B' class pipe 2.5 M long, driven in earth (150 mm dia pit filled with charcoal & salt). The pipe should have removable plug at top.</p>		
<p>8.6 Flood Lighting on Tower</p>		
<p>8.6.0 Supply & installation of High Mast, fabricated out of special steel plates conforming to BS-EN10-025 only one longitudinal seam weld per section along with Lantern Carriage, cast aluminium junction box, self-sustaining Winch arrangement for lowering and raising the Lantern Carriage Assembly, head frame, stainless wire ropes of AISI 316 grade, cables and lighting finial, earth pits along with Light Fittings complete. Tower to be complete with painting & details as per technical specification.</p>		
<p>16 m motorized high mast pole suitable for 50 m/sec wind speed, with raising lowering system comprising head frame, luminaires carriage suitable to install 6 nos. luminaires in symmetrical arrangement, double drum, winch, 6 mm dia. SS wire rope, trailing cable, connector, integral power tool motor, manual handle, junction box, lightening finial, including complete wiring, supply of foundation bolts manufactured from special steel, along with nuts, washers, anchor plates, template. Supply of LED floodlight min. 6 nos. of up to 150 W each (Make/model- Bajaj- BJFL 150W LED I & equivalent model in Philips /Wipro make). Supply of LED type single dome aviation obstruction light outdoor stand mounted feeder pillar with 63 A TPN MCB incomer, single dial time switch, contactor for automatic switching of luminaires, power tool control with 2 no 9A Contactor, raise lower push buttons, incoming 16 sqmm & outgoing 16 & 2.5 sq mm terminals. Complete Testing & commissioning of high mast is included in bidder scope, the civil foundation for high mast is also</p>		
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<p>included in bidder scope. (Design & Drawing to be got approved from IDMC)</p>		
<p>8.6.1 Flood Light Tower Specification</p> <p>Flood lighting tower shall be either of steel tubular or MS angle type with suitable arrangement at the top of the tower for fixing the lighting fixtures. Tower shall be fabricated out of MS medium class pipes ERW type or with MS angles/flats etc. as specified in the attached drawing. Each tower would have one MS water tight switch box fabricated out of 14 SWG thick sheet steel complete with a heavy duty 30 A, 6 way power connector, 6 way heavy duty 30 A connector for neutral, 15 A SP MCB with 10 KA rupturing capacity as shown in the attached drawing of flood light tower. The control gearbox of each light fitting, received with the fittings, shall be installed on the working platform at the top of tower. MS switch box at bottom of tower and control gear box of each light fitting on tower platform shall be connected by three- core, copper conductor of suitable size , FRLS , PVC insulated and sheathed un-armoured cable in conduit pipe through a common junction box installed at the tower platform as shown in the attached drawing of tower. Cost of this conduit, cable and junction box at tower platform is included in supply and installation cost of tower. The tower shall be painted with two coats of anti-corrosive zinc chromate red-oxide primer before despatch to site and two coats of Aluminium paint after installation. The earthing of tower shall be carried out with PVC insulated 10 Sq. mm Aluminium conductor (single core) PVC insulated black wire, connected to perforated 38 mm GI `B' class pipe as shown on flood light pole drawing, driven in earth near tower (150 mm dia pit filled with charcoal and salt).</p>		
<p>8.6.2 Installation of flood light tower</p> <p>Installation of flood light tower shall be done by the contractor on concrete pedestal, which shall be made ready by IDMC as per the drawing. However necessary GI pipes (minimum 38 mm NB) shall be provided by electrical contractor to put in the concrete pedestal to facilitate pulling of power cables & earthing wire. Nothing extra shall be paid for providing these GI pipes, as cost of the same is including in laying & connecting of cables/wires.</p>		
<p>8.6.3 Installation of flood lights on tower</p>		
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	<p>This includes fixing of street light fittings complete with accessories and lamps on the bracket of tower, connecting it with 3 x 4 Sq. mm copper stranded conductor, FRLS , PVC insulated,& sheathed, un-armoured cable in a flexible GI conduit from water tight MS junction box installed on tower platform through control gear box of light fitting, testing and commissioning. One conductor of cable shall be connected with earthing point of light fitting at one end and earthing point of MS junction box at the other end. If the tower has more than one light fitting, each fitting should have 3 x 4 sq. mm copper stranded conductor, independent cable from MS junction box to fitting.</p>	
8.7	<p>Flood Lighting on building top</p> <p>This includes supplying and installation of MS switch box (specification same as that of street light pole) approximately 1 M above ground, laying of 25 mm conduit up to fitting on top of building, installation of flood light with grouting of clamps etc. if required, connecting with 3 x 2.5 Sq. mm copper stranded conductor PVC insulated cable, testing and commissioning of flood lights.</p>	
8.8	<p>General notes for Street & Flood Lighting</p>	
8.8.1	<p>For supplying and laying of cable, clause no 4.1, 4.2, 4.3, 4.4 & 4.5 of technical specification (POWER CABLE WORK) shall be applicable.</p>	
8.8.2	<p>If Purchaser supplies street light fixtures, flood lights and post top lanterns, clause no. 7.2.2 of technical specification shall be applicable.</p>	
8.8.3	<p>For street light poles along roads, nearest finished road level shall be taken as ground level and for street light poles and flood light poles along compound wall/away from roads, existing ground/finished ground shall be taken as ground level.</p>	
8.8.4	<p>Minimum Distance of 1.5 M shall be maintained between centre of pole and centre of curb of road. For compound wall poles, distance between compound wall and poles shall be minimum 5 M.</p>	
8.8.5	<p>A minimum loop of 1.5 M of cable shall be provided near each street light pole for all incoming and outgoing cables.</p>	
9.0	<p>SWITCH BOARDS AND DISTRIBUTION BOARDS</p>	
9.1	<p>Cubicle type electrical switch boards</p>	
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<p>9.1.1 General</p> <p>It shall be of cubicle type (having individual cubical for each incoming and outgoing feeder), totally enclosed, dust and vermin proof, floor mounted, fabricated out of 14 G mild steel sheets of commercial quality. However doors & covers may be fabricated from 1.6 mm thick (16 G) CRCA sheets. A base channel of 75 x 75 mm shall be provided at the bottom. A horizontal wire way cable compartments with screwed cover shall be provided at the top or bottom (as per site conditions, first preference being at top) to take inter connecting control wiring between vertical sections. Separate cable compartments of adequate size running for the complete height of the switchboard in the case of front access boards shall be provided for incoming and outgoing cables. Adequate & proper support shall be provided in cable compartments to support cables.</p> <p>The height of switchboard to be so designed that no operating switch is at more than 1900 mm and less than 300 mm from finished floor level. Door closing shall be by quick open able thumb screws. Mechanical inter-locking to be there for doors of cubicles having incoming/outgoing feeder such that door can be opened only if feeder is OFF.</p> <p>9.1.2 Painting</p> <p>All the MS parts shall be given rigorous rust proofing process comprising degreasing, pickling, phosphatising etc. and anti rust primer coating, following by powder coating finish with two coats of shade 692 to IS 5 with outside & white on the inside paint thickness shall not be less than 50 microns approved shade. Half-litre paint shall be supplied along with panel for touch up wherever necessary.</p> <p>9.1.3 Gaskets</p> <p>All joints between different sections and the switchboard shall be provided with synthetic rubber gaskets so as to make the complete board completely dust proof as per IP 54.</p> <p>9.1.4 Bus Bars</p> <p>A completely enclosed ventilated dust & vermin proof bus bar compartment for the horizontal & vertical busbars. The rectangular busbar shall be made of high conductivity Aluminium alloy, PVC sleeved (heat shrinkable), air insulated, and of adequate</p>		
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<p>size (full load current for phase busbars and half rated current for neutral busbars), current density to be considered as 0.8 Amp/sq.mm for operation on 3 phase, 4 wire, 440 V, 50 Hz. AC supply system, as per IS 345-1963 with amendment till date. The busbars shall be supported and separated by strong epoxy based SMC/DMC blocks at close intervals to prevent busbar sag and to effectively withstand electro-magnetic stresses in the event of a short-circuit (25 MVA fault level on 415 volts for 1 sec). Minimum clearance to be maintained for enclosed indoor air insulated busbars working at system voltage up to 600 V shall be as follows:</p> <p>Phase to neutral - 20 mm Phase to phase - 25 mm</p> <p>Feeder boxes should be completely shrouded by sheet steel plates provided between the feeder boxes and the busbar chambers, in order to avoid falling down of any nuts/ bolts/parts into the busbar chambers while carrying out maintenance of the feeder components.</p> <p>MINIMUM SIZE OF MAIN AL. BUSBAR OF CUBICAL TYPE MAIN SWITCH BOARD TO BE -- 40 X 6 SQ.MM.</p> <p>9.1.5 Components of switch boards</p> <p>The panel shall be provided with switches, fuses, MCB, MCCB, meters and instruments etc. of size, capacity as specified in schedule of quantities. Only approved make as selected by contractor in annexure III can be used for manufacture of switchboard.</p> <p>Switches disconnector fuse switches:</p> <p>The load break switches shall confirm to IES-947-3 and IS 13947-3 specification. They shall be suitable for continuous maximum rating having positive isolation with position indication of contact separation. They should have high short circuit making and withstanding capacities. Breaking capacity should correspond to AC 23A utilisation category. Switches handle shall be provided with door interlocking arrangement. Also 'defeat' arrangement shall be provided to open the door in switch 'Close' position for testing purpose. Live terminals of the switch shall be shrouded.</p> <p>HRC cartridge fuse links</p> <p>These shall be non deteriorating HRC cartridge link type with operation indicator which will be visible without removing fuses for the service. These shall be complete with moulded phenolic fuse</p>		
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<p>base and cover. The fuse base shall be so located in the modules to permit insertion of fuse pullers and removing of fuse links without any problem.</p> <p>Miniature circuit breakers (MCB)</p> <p>These shall be suitable for 230/415 V, 50 Hz. AC supply and current rating as specified in schedule of quantities. These shall be of short circuit current of 10 KA minimum at 0.5 pf on 230 V.AC, long mechanical and electrical operation life, with over load tripping through accurately calibrated thermal bimetal strips and short circuit tripping through magnetic coil. Complete MCB should be housed in heat resistant moulding. Over current tripping should result in switching off all poles automatically even if tripping only takes place in one pole. Miniature circuit breakers shall confirm IS 13947 - 1993.</p> <p>Moulded case circuit breakers (MCCB)</p> <p>The MCCB shall be as per to provisions of IS 13947 – 1993. The MCCB's shall be of triple / four pole construction arranged for simultaneous three /four pole manual closing or opening and automatic instantaneous tripping on short circuits. Closing mechanism shall be quick make, quick break and trip-free type. 'ON', 'OFF' and 'Trip' indications shall be provided on the front cover with door interlocking facility. All feeders having MCCB shall be provided with neutral link complete with isolating link, if not FOUR POLE type. The control voltage shall be 240 V AC. MCCB's shall be provided with following interlocking devices for interlocking to door of switchboard.</p> <ul style="list-style-type: none"> ➤ Handle interlock to prevent unnecessary manipulation of the breaker. ➤ Door interlock to prevent doors being opened when the breaker is on ON position. ➤ De-interlocking device to open the door even if the breaker is in ON position. <p>The MCCB's shall be rated for continuous maximum duty as specified. The rating of the MCCB's shall be as per the feeder details.</p> <p>Rated breaking capacities shall be as under:</p> <p>MCCB's up to 100 Amps 25 kA (minimum) at 415 volts</p>		
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<p>Above 100 A to 400 Amps 35 kA (minimum) at 415 volts</p> <p>Above 400 A 50 KA (minimum) at 415 volts</p> <p>Measuring instruments & Indication Lamps</p> <p>Measuring instruments shall be of square pattern having approximate dimensions 96mm x 96mm, flush mounting type. Necessary auxiliary instruments like CTs, PTs etc. are also included in the scope of supply.</p> <p>All AC meters shall be of moving iron type having class 1.0 accuracy for voltmeters and 1.5 for ammeters. Voltmeter shall be suitable for direct line connection. Voltmeters shall be connected through fuses only. Energy meters shall be suitable to measure unbalanced/balanced loads of 3-phase 3/4-wire system.</p> <p>Ammeters provided for switch fuse units shall be with rotary selector switches and those for motors shall be without selector switches.</p> <p>All voltmeters shall be provided with selector switches.</p> <p>Ammeters for 40 Amps and above shall be CT operated. For each outgoing feeder, LED type indication Lamp shall be provided in its cubicle door. For incoming feeder, LED type indication lamp shall be provided for all three phases. If specifically asked in schedule of quantities, digital type Ammeters, Voltmeters & Energy meters shall be provided rather than analogue type specified above.</p> <p>Current Transformers (CTs) & Potential Transformers (PTs)</p> <p>CTs shall be cast resin insulated type. Primary and secondary terminals shall be marked indelibly. CTs shall preferably be mounted on stationery parts. CT rating and ratios shall be as per feeder ratings. These shall be capable of withstanding momentary short circuit and symmetrical short circuit current for 1 second. Neutral side of CTs shall be earthed. Protection CTs shall have low reactance, accuracy class "SP" and an accuracy limit factor greater than "10". Instrument CTs shall be of accuracy class "1.0" and accuracy limit factor less than "5.0". CT shall confirm to IS 2705 (part I, II & III) in all respects. PTs shall confirm to IS 3156 (part I, II & III) in all respects.</p> <p>Earth leakage circuit breakers (ELCB/RCCB)</p>		
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<p>These current operated ELCB's shall be suitable for 2/4 poles 230/415 V, 50 Hz. AC supply, current and sensitivity rating to be as specified in schedule of quantities. (If not specified it may be taken as 30 MA). These shall be able to withstand short circuit current of 3 kA minimum at 230 V AC and have long operational life. This shall incorporate highly sensitive relay to trip the circuit in case of earth leakage. This shall have the facility to trip the circuit during interruption in the earth connection or loss of supply neutral. Over current tripping should result in switching off all poles automatically even if tripping takes place in one pole. Earth leakage circuit breakers shall conform to BS - 4293.</p> <p>9.1.6 Connections</p> <p>Connections to the busbars shall be made by drilling holes. However, no holes shall be left in the busbars. The bolts & nuts used for connections to busbars shall be of Aluminium alloy of tinned forged brass. For tapping of connections from busbars suitable size PVC insulated copper stranded conductor wire (minimum size for power wiring 4.0 sq. mm & for control wiring 1.5 sq. mm.) shall be used with suitable size and type of crimped lugs/cable sockets. For connection of feeder above 63 Amps, only Al. alloy busbar links with PVC tapes shall be used. Suitable size cable boxes shall be provided for incoming/ outgoing cable of sizes more than 95 sq.mm. For all outgoing cables, cable alleys of suitable sizes in sides and tops, as required for proper cable connections/laying inside the panel, shall be provided. Switchboard shall be suitable for Aluminium conductor PVC insulated incoming and outgoing cables. Removable gland plates shall be provided for cable entries.</p> <p>9.1.7 Earthing</p> <p>Two independent earthing points shall be provided outside the panel near bottom and these shall be inter-connected with GI earthing busbars of minimum size 40 x 6 mm. All earthing points inside the distribution board shall be interconnected to these earthing points with suitable size copper conductor PVC insulated wire.</p> <p>9.1.8 Name plates</p> <p>Switch board/distribution board shall be provided with danger plate and name plates for all incoming and outgoing feeders. These name plate shall be of PVC (black colour base & white letters</p>		
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<p>engraved) screwed to panel. PVC identification ferrule numbers shall be used for all internal wiring.</p> <p>9.1.9 Approvals</p> <p>The drawing showing general arrangements and detailed wiring diagram for the switch board shall be submitted to employer for approval, prior to manufacture and switch board shall be got inspected, prior to despatch to project site. The complete switchboard and its component shall conform to Indian Electricity Rules & relevant I.S.S. Approval if required from Electrical Inspector shall be obtained by contractor and changes if desired by Electrical Inspector shall be carried out.</p> <p>9.1.10 Rubber Matting</p> <p>A 15 mm thick rubber matting, 1 meter wide shall be provided in front and along full length of the main switchboard. The rubber mat shall withstand 15 kV for 1 minute & Leakage current shall not exceed 160 mA .</p> <p>9.1.11 Space Heaters</p> <p>The main switchboard shall have thermostatically controlled space heaters with a controlling 16 A 230 V MCB & socket outlet to eliminate condensation.</p> <p>9.2 Electrical Distribution Boards</p> <p>9.2.1 General</p> <p>These shall be wall mounted, surface/flush type, indoor type enclosure, hinged front cover, dust and vermin proof fabricated out of 16 G mild steel sheet of commercial quality. All components such as switches, M.C.B. etc. to be so mounted inside the distribution boards, that only operating handles/knobs are visible outside the front hinged door. Detachable cable/conduit entry plates with required 25 mm dia knockouts shall be provided on top and bottom of D.B.</p> <p>If distribution board is concealed and receiving incoming power from bottom of board by Armoured cable through GI pipes, height of DB shall be increased suitably, so that 2 mm thick gland plate can be fixed as shown in the attached sketch no. 24.</p> <p>Alternatively, if specifically asked, readymade DBs (in standard size/ capacity) of reputed make, as approved by the purchaser, with double metal door (16/18 G sheets) complete with Tinned copper bus bars, neutral link, earth bus, DIN rail, detachable</p>		
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<p>gland plate and all interconnections may also be provided and installed.</p> <p>9.2.2 Painting</p> <p>Same as clause no. 9.1.2 of cubicle switch boards.</p> <p>9.2.3 Gaskets</p> <p>Same as clause no. 9.1.3 of cubicle switch boards.</p> <p>9.2.4 Bus bars</p> <p>Same as clause no. 9.1.4 of cubicle switchboard except that these shall be only of copper & minimum size of busbars shall be 19 x 6 mm, current density being 1.5 A per sq. mm.</p> <p>9.2.5 Component of Distribution board</p> <p>Same as clause no. 9.1.5 of cubicle switch board.</p> <p>9.2.6 Connections</p> <p>All interconnections shall be done either by solid copper PVC insulated or by suitable size (minimum 4.0sq.mm.) Copper stranded conductor PVC insulated wires with suitable size and type of crimped type plug. Arrangement shall be there for directly mounting of M.C.B. on busbars. The bolts and nuts used for connections to busbars shall be of Al. alloy or tinned forged brass.</p> <p>Enough space shall be provided inside the distribution board to accommodate loop of surplus incoming and outgoing wires. For all line conductor PVC colour of wire would be Red, Yellow, Blue & that of neutral to be Black. For accommodating neutral wires of all incoming and outgoing circuits , suitable size connector or neutral bus shall be provided inside the distribution board.</p> <p>9.2.7 Earthing</p> <p>Two independent earthing points shall be provided inside the distribution board in case of 3 phase and one earthing point in case of single phase distribution system. An earthing bus of copper shall be provided inside the D.B.</p> <p>9.2.8 Name plates</p> <p>Same as clause no. 9.1.8 of cubicle switch boards.</p> <p>9.2.9 Approval</p> <p>Same as clause no. 9.1.8. of cubicle switch boards except that sample approval of only one typical distribution board may be taken from employer.</p>		
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<p>9.2.10 Components of distribution boards</p> <p>Same as clause no. 9.1.5 of cubicle switch boards.</p> <p>10.0 COMPLETION TEST AND DRAWINGS</p> <p>After supply and installation of complete project or a particular building/area, following tests shall be carried out by the contractor before switching on the power to installation and the results shall be recorded and submitted to the site engineer. If results are not satisfactory/as per the standard set herewith, the contractor shall identify the defects/short coming and shall rectify the same. Nothing extra shall be paid for carrying out these tests and contractor has to arrange all necessary instruments.</p> <p>10.1 Insulation resistance to earth This to be measured with all fuse links in place, all switches on, all lamps and appliances in position by applying a voltage not less than twice the working voltage (subject to a limit of 500V). Insulation resistance of the whole or any part of the installation to earth must not be less than 50 Mega-ohms divided by the number of outlets (points and switch positions) except that it need not exceed 1 Megaohm for the whole installation.</p> <p>10.2 Insulation resistance between conductors Test to be made between all the conductors connected to one pole or phase conductor of the supply and all the conductors connected to the middle wire or neutral or the other pole or phase conductors of the supply. For this test, all lamps shall be removed and all switches put on. The result of the test must be 50 Mega-ohms divided by the number of outlets (point and switch positions) but need not exceed one Megaohm for the whole installation.</p> <p>10.3 Polarity of single pole switches Test shall be made to verify that all non-linked single pole switches are on phase conductor (Live) and not on the neutral or earthed conductor. This can be done by connecting test lamps between two terminals of switch and earth. If the lamp lights up when switch is ON & either terminal is touched the switch is correctly installed.</p> <p>10.4 Resistance of metal conduits/sheaths (Earth continuity test) In case of cables encased in metal whether conduit of metallic sheathing, the total resistance of the conduit or sheathing from the earthing point any other position in the completed installation shall not exceed 2 ohms. This can be carried out by the circuit</p>		
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<p>shown in Annexure VII. One end of the lead is connected to the ECC at its connection with the electrode and the other to the farthest point of the ECC. First, current through the circuit is measured with the resistance of 2 ohms short-circuited by the link. Next, current is measured through the two ohms resistance by disconnecting the two leads from the ECC and joining them together. If current is more in the first case, the resistance of ECC is less than two ohms.</p> <p>10.5 Completion Drawings and Documents</p> <p>10.5.1 Completion drawings After completion of works & before issuance of virtual completion certificate the contractor shall submit completion drawings in the form of one complete set of originals on sepia cloth with two sets of blue prints & three sets of documents as listed below:</p> <ul style="list-style-type: none"> i) As built conduit layout for lights, sockets, outlets, fans, telephones and computer data circuits & sub-mains showing position of bends/inspection boxes/draw-out boxes/junction boxes / outlet boxes / switch boxes, conduit size, number & size of wires in each run, number & size of earth continuity conductor etc. ii) As built layout of lights, sockets outlet, telephone points, computer data points, telephone tag boxes, computer data patch panels, switch boards, distribution boards etc. iii) As built details of electric, telephone & computer cable runs, showing size, type & number of cables of mode of installation. iv) As built detail earthing conductors, earth pits and lightning protection system etc. v) As built General Arrangement and schematic diagrams of switchboards & distribution boards. vi) A certificate shall be furnished by the contractor countersigned by the licensed electrical supervisor, under whose direct supervision the installation was carried out. This certificate shall be in the prescribed form as required by the local supply/electrical inspector authority. The contractor shall be responsible for getting the electrical installation inspected & approved by the local & statutory authorities concerned. 		
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<p style="text-align: center;">11.0 MODE OF MEASUREMENT</p> <p style="text-align: center;">11.1 WIRING (PART I) TRADE CODE 81</p> <p>Item Mode of Measurement</p> <ol style="list-style-type: none"> 1. Each light point shall be measured as one no. 2. Two light points shall be measured as one no. 3. Three light points shall be measured as one no. 4. Four light points shall be measured as one no. 5. Each light point shall be measured as one no. 6. Two light points shall be measured as one no. 7. Three light points shall be measured as one no. 8. Four light points shall be measured as one no. 9. One light with 2 switches shall be measured as 1 no. 10. One light with 2 switches shall be measured as 1 no. 11. One fan point shall be measured as one no. 12. One fan point shall be measured as one no. 13. One exhaust/bracket fan shall be measured as one no. 14. One exhaust/bracket fan shall be measured as one no. 15. One buzzer point shall be measured as one no. 16. One buzzer point shall be measured as one no. 17. One buzzer extension shall be measured as one no. 18. One isolated 10 A power point shall be measured as one no. 19. One 10 A power point in lighting SB shall be measured as 1 no. 20. One isolated 10 A power point shall be measured as one no. 21. One 10 A power point in lighting SB shall be measured as 1 no. 22. One 20 A power point shall be measured as one no. 23. One 25 A power point shall be measured as one no. 24. One 30 A power point shall be measured as one no. 25. One 20 A power point shall be measured as one no. 26. One 25 A power point shall be measured as one no. 27. One 30 A power point shall be measured as one no. 28. One 10 A switch and socket shall be measured as one no. 29. One 10 A socket shall be measured as one no. 30. One 20 A ON/OFF switch and socket shall be measured as one no. 		
Technical Specifications - Internal Electrification		BIDDER

IDMC Anand	Section IV-A	Page IV-A -47
<p>31. One aviation light point shall be measured as 1 no.</p> <p>32. Each light point shall be measured as one no.</p> <p>33. Two light points shall be measured as one no.</p> <p>34. Three light points shall be measured as one no.</p> <p>35. Four light points shall be measured as one no.</p> <p>36. Each light point shall be measured as one no.</p> <p>37. Two light points shall be measured as one no.</p> <p>38. Three light points shall be measured as one no.</p> <p>39. Four light points shall be measured as one no.</p> <p>40. One fan point shall be measured as one no.</p> <p>41. Blank</p> <p>42. One fan point shall be measured as one no.</p> <p>43. One exhaust/bracket fan shall be measured as one no.</p> <p>44. One exhaust/bracket fan shall be measured as one no.</p> <p>45. One buzzer point shall be measured as one no.</p> <p>46. One light controlled by one MCB shall be measured as one no.</p> <p>47. Group of 2 lights controlled by 1 MCB shall be measured as one no.</p> <p>48. Group of 3 lights controlled by 1 MCB shall be measured as one no.</p> <p>49. Group of 4 lights controlled by 1 MCB shall be measured as one no.</p> <p>50. Group of 3 lights controlled by 1 MCB shall be measured as one no.</p> <p>51. Group of 4 lights controlled by 1 MCB shall be measured as one no.</p> <p>52. Group of 5 lights controlled by 1 MCB shall be measured as one no.</p> <p>53 to 58 Length of single run of PVC insulated wire for circuit (Not total of 3 or 5 wires but one length) used, to be measured in meter. (This will be equal to conduit length as loose/loop wire inside distribution board/lighting switch box / 6, 16, 20 A power plug boxes, not to be measured but to be carried out). Measurement in meters to be restricted up to two points after decimal.</p> <p>59 to 65 Length of single run of PVC insulated wire for sub-main used, to be measured in meter. (This will be equal to conduit length as loose/loop wire inside distribution board not to be measured but to be provided). Measurement in meters to be restricted up to two points after decimal.</p> <p>66 to 68 Length of conduit including bends laid shall be measured in meters. Measurement to be restricted up to two points after decimal.</p>		
Technical Specifications - Internal Electrification		BIDDER

IDMC Anand	Section IV-A	Page IV-A -48
69 to 72	Length of GI pipe including bends shall be measured in meters. Measurement to be restricted up to two points after decimal.	
73 to 75	Length of raceway to be measured in meters without junction box. Measurement to be restricted up to two points after decimal	
76 to 78	Each raceway junction box to be measured as one no.	
79	One 20 A power point with piano switch & socket placed separately shall be measured as one no.	
80	One 20 A power point with modular switch and socket outlet installed separately shall be measured as one no.	
81 to 85	Length of single run of wire shall be measured in meters. Extra wire at ends for switch loops etc. not to be measured. Measurement shall be restricted up to two points after decimal.	
86 to 87	Length of GI pipe including bends shall be measured in meter. Measurement to be restricted to two points after decimal.	
88 to 90	Length of cable tray including bends used to be measured in Meter. Measurement to be restricted up to two points after decimal.	
11.2 INSTALLATION AND SUPPLY OF FIXTURES (PART-II) TRADE CODE 82		
Item	Mode of Measurement	
1 to 9	Each lighting fixture shall be measured as one no.	
10 to 12	Each fan shall be measured as one no.	
13	Each exhaust fan shall be measured as one no.	
14	Each buzzer/bell/musical bell shall be measured as one no.	
15	Each aviation light (consisting of 2 bulbs) shall be measured as 1 no.	
16 to 17	Each opening of exhaust fan shall be measured as one no.	
18 to 19	Each clamp shall be measured as one no.	
20	Each GI bolt shall be measured as one no.	
Technical Specifications - Internal Electrification		BIDDER

IDMC Anand	Section IV-A	Page IV-A -49																																																				
<div>11.3 STREET LIGHTING (PART-III) TRADE CODE 83</div> <table><tr><td>Item</td><td>Mode of Measurement</td></tr><tr><td>01</td><td>Each pole with one arm shall be measured as one no.</td></tr><tr><td>02</td><td>Each pole with two arms shall be measured as one no.</td></tr><tr><td>03</td><td>Each pole with three arms shall be measured as one no.</td></tr><tr><td>04</td><td>Each pole with one arm shall be measured as one no.</td></tr><tr><td>05</td><td>Each pole with two arms shall be measured as one no.</td></tr><tr><td>06</td><td>Each pole with three arms shall be measured as one no.</td></tr><tr><td>07</td><td>Each street light bracket shall be measured as one no.</td></tr><tr><td>08</td><td>Each flood light tower shall be measured as one no.</td></tr><tr><td>09</td><td>Each flood light tower shall be measured as one no.</td></tr><tr><td>10</td><td>Each pole for post top lantern shall be measured as one no.</td></tr><tr><td>11</td><td>-do-</td></tr><tr><td>12</td><td>Each light on street light pole arm shall be measured as one no.</td></tr><tr><td>13</td><td>Each light on street light bracket shall be measured as one no.</td></tr><tr><td>14</td><td>Each post top lantern shall be measured as one no.</td></tr><tr><td>15</td><td>-do-</td></tr><tr><td>16</td><td>Each floodlight shall be measured as one no.</td></tr><tr><td>17</td><td>-do-</td></tr><tr><td>18</td><td>Each control panel shall be measured as one no.</td></tr><tr><td>19</td><td>Each floodlight shall be measured as one no.</td></tr></table> <div>11.4 EARTHING AND LIGHTING PROTECTION (PART-IV) TRADE CODE 84</div> <table><tr><td>Item</td><td>Mode of Measurement</td></tr><tr><td>1</td><td>Each plate type earthing pit shall be measured as one no.</td></tr><tr><td>2</td><td>Total length as laid of continuity conductor shall be measured in meter.</td></tr><tr><td>to</td><td>Overlaps shall not be measured. Measurement shall be restricted to two</td></tr><tr><td>8</td><td>points after decimal.</td></tr><tr><td>9</td><td>Each lighting arrestor shall be measured as one no.</td></tr></table>			Item	Mode of Measurement	01	Each pole with one arm shall be measured as one no.	02	Each pole with two arms shall be measured as one no.	03	Each pole with three arms shall be measured as one no.	04	Each pole with one arm shall be measured as one no.	05	Each pole with two arms shall be measured as one no.	06	Each pole with three arms shall be measured as one no.	07	Each street light bracket shall be measured as one no.	08	Each flood light tower shall be measured as one no.	09	Each flood light tower shall be measured as one no.	10	Each pole for post top lantern shall be measured as one no.	11	-do-	12	Each light on street light pole arm shall be measured as one no.	13	Each light on street light bracket shall be measured as one no.	14	Each post top lantern shall be measured as one no.	15	-do-	16	Each floodlight shall be measured as one no.	17	-do-	18	Each control panel shall be measured as one no.	19	Each floodlight shall be measured as one no.	Item	Mode of Measurement	1	Each plate type earthing pit shall be measured as one no.	2	Total length as laid of continuity conductor shall be measured in meter.	to	Overlaps shall not be measured. Measurement shall be restricted to two	8	points after decimal.	9	Each lighting arrestor shall be measured as one no.
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Technical Specifications - Internal Electrification		BIDDER																																																				

IDMC Anand	Section IV-A	Page IV-A -50
<p>10 Total length as laid of roof conductor shall be measured in meter. Overlaps shall not be measured. Measurement shall be restricted to 1st point after decimal.</p> <p>11 Each earthing pit shall be measured as one no.</p> <p>12 Length of PVC insulated cable to be measured in Metres. (Portion of cable to without outer insulation and armouring inside the distribution board/junction</p> <p>13 box/cable joint/switch box also to be measured and paid. All loops inside the board/switch box/ground/trench also to be measured. No deduction in quantity or rate to be effected for more than one cable laid in same trench).No deduction in quantity or rate to be effected for cable laid in hume pipe/GI pipe/trench etc. provided by employer. Measurement to be restricted up to two points after decimal.</p> <p>TELEPHONE AND COMPUTER DATA WIRING SYSTEM (PART-V) TRADE CODE 85</p> <p>Item Mode of Measurement</p> <p>1 to 2 Each telephone point shall be measured as one no.</p> <p>3 to 4 Two telephone points in one box shall be measured as one no.</p> <p>5 to 6 Each telephone point shall be measured as one no.</p> <p>7 to 8 Two telephone points in one box shall be measured as one no.</p> <p>9 to 10 Length of wire/cable laid shall be measured in Meters, loose wire provided in junction box/ tag box/ outlet box shall not be measured and paid. Measurement to be restricted up to two points after decimal.</p> <p>11 One telephone outlet shall be measured as one no.</p> <p>12 Two telephone outlet in one box shall be measured as one no.</p> <p>13 to 14 One telephone outlet shall be measured as one no.</p> <p>15 Length of CAT 5 UTP cable laid shall be measured in meter. Wire provided in junction box / tag box/outlet box shall not be measured and paid. Measurement to restricted to two points after decimal.</p> <p>16 to 17 Each computer outlet shall be measured as one no.</p> <p>18 to 20 Length of cable laid shall be measured in meter. length of cable & without outer insulation and armouring inside tag box / junction</p>		
Technical Specifications - Internal Electrification		BIDDER

IDMC Anand	Section IV-A	Page IV-A -51
	<p>box/outlet box etc. shall also be measured and paid. Loop of cable provided shall also be measured. No deduction in quantity or rate shall be done for laying more than one cable in same trench. No deduction in measurement or rate shall be made for cable drawn through hume pipe/trench/GI pipe etc. provided by employer. Measurement to be restricted up to two points after decimal</p>	
21	Spare	
22	Each extension of telephone point shall be measured as one no.	
23	Spare	
24 to 29	<p>Length of cable laid shall be measured in meter. length of cable & without outer insulation and armouring inside tag box / junction box/outlet box etc. shall also be measured and paid. Loop of cable provided shall also be measured. No deduction in quantity or rate shall be done for laying more than one cable in same trench. No deduction in measurement or rate shall be made for cable drawn through hume pipe/trench/GI pipe etc. provided by employer. Measurement to be restricted up to two points after decimal</p>	
30 to 34	Each tag block shall be measured as one no.	
35 to 38	<p>Length of Telephone cable shall be measured in meters. All loops of cable in ground, tag box etc to be measured. Measurement to be restricted up to two points after decimal.</p>	
39	<p>Length of TV cable shall be measured in meters. All loops of cable in air and boxes not be measured and paid. Measurement to be restricted up to two points after decimal.</p>	
40 to 41	Each TV outlet to be measured as one no.	
42	<p>Length of UTP cable shall be measured in meters. All loops of cable in air and boxes not to be measured and paid. Measurement to be restricted up to two points after decimal.</p>	
43	<p>Length of TV cable shall be measured in meters. All loops of cable in air and boxes shall be measured and paid. Measurement to be restricted up to two points after decimal.</p>	
44 to 47	<p>Length of Telephone cable laid shall be measured in meters. All loops of cable in ground/air, tag box etc to be measured. Measurement to</p>	
Technical Specifications - Internal Electrification		BIDDER

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<p>be restricted up to two points after decimal.</p>		
<p>11.6 DISTRIBUTION SYSTEM (PART-VI)</p>		
<p>TRADE CODE 86</p>		
<p>Item Measurement</p>		
1 to 65	Each switchboard /distribution board complete with switchgear for incoming and outgoing feeder shall be measured as one set.	
66 to 82	Total length of cable supplied to be measured in metre. Measurement to be restricted up to two points after decimal.	
83 to 90	Length of PVC insulated and sheath cable to be measured in meters (Portion of cable without outer insulation and armouring inside the main panel/distribution board also to be measured and paid. All loops inside the board/in ground or trench also to be measured and paid). Measurement in meters to be restricted up to two points after decimal and in addition no reduction in rates or quantity to be effected for drawing cable through hume pipe/ trench/ GI pipe etc. provided by employer for not providing bricks and sand etc.	
	NOTE : FOR ITEM NO. 83 TO 90, ONE CABLE SHALL BE MEASURED UNDER ONE ITEM ONLY THOUGH IT MIGHT HAVE BEEN LAID UNDER TWO ITEMS (UNDER GROUND AS WELL AS IN AIR) FOR DIFFERENT PORTION OF IT'S LENGTH. ITEM AS PER WHICH MORE LENGTH HAS BEEN LAID SHALL BE APPLICABLE FOR COMPLETE LENGTH.	
<p>11.7 GENERAL</p>		
	The following guidelines to be followed for recording part payment of various items, if rather than secured advance, Engineer Incharge agrees to recommend part rate for incomplete work.	
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<p>11.7.1 Part I (Wiring)</p> <p>(a) Point wiring, sockets wiring, group wiring, circuit wiring, sub-main wiring etc.</p> <ul style="list-style-type: none"> - Supply & laying of conduit in ceiling only (30% of the item rate) - Supply & laying of conduit in ceiling / walls and switch boxes i.e., point ready without wiring (30% of the item rate) - Item ready with wiring & switches but without testing / commissioning (30% of the item rate) - Testing & commissioning (10% of the item rate) <p>(b) Providing and fixing Cable Tray</p> <ul style="list-style-type: none"> - Supply of cable tray only (85% of the item rate) - Laying of cable trays (10% of the item rate) - Testing & commissioning (5% of the item rate) <p>(c) Wiring in existing conduit/pipes/modular furniture etc.</p> <ul style="list-style-type: none"> - Supply of wires (80% of item rate) - Laying of wires (10% of item rate) - Testing and commissioning (10% of item rate) <p>11.7.2 Part II (Installation of Fixtures)</p> <ul style="list-style-type: none"> - <i>After installation of fixture (90% of the item rate)</i> - After testing & commissioning (10% of the item rate) <p>11.7.3 Part III (Street Lighting)</p> <p>(a) Street light poles and Towers</p> <ul style="list-style-type: none"> - Supply of street light poles & flood light towers (80% of the item rate) 		
Technical Specifications - Internal Electrification		BIDDER

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<ul style="list-style-type: none"> - Installation of street light poles & towers (15% of the item rate) - Testing & commissioning of poles/ towers (5% of the item rate) <p>(b) Installation of fixtures</p> <ul style="list-style-type: none"> - Installation of fixtures (90% of the item rate) - Commissioning of fixtures (10% of the item rate) <p>11.7.4 Part IV (Earthing & Lighting Protection)</p> <ul style="list-style-type: none"> - Supply of item only (85% of the item rate) - Installation of item (10% of the item rate) - Testing & commissioning of item (5% of the item rate) <p>11.7.5 Part V (Telephone & Computer Data Wiring System)</p> <p>(a) Point Wiring & wiring</p> <ul style="list-style-type: none"> - Supply & laying of conduit in ceiling only (30% of the item rate) - Supply & laying of conduit in ceiling/ walls and switch boxes i.e., point ready without wiring (30% of the item rate) - Item ready with wiring and switches but without testing/commissioning (30% of the item rate) - Testing & commissioning (10% of the item rate) <p>(b) Supply of Cable</p> <ul style="list-style-type: none"> - Supply of cables only (95% of the item rate) - Testing & commissioning (5% of the item rate) <p>(c) Laying of cables</p> <ul style="list-style-type: none"> - laying of cables (90% of the item rate) testing and commissioning (10% of item rate) 		
Technical Specifications - Internal Electrification		BIDDER

IDMC Anand	Section IV-A	Page IV-A -55
<p>(d) providing wires & laying of wires in existing conduits/ pipes/ modular furniture</p> <ul style="list-style-type: none"> <li>- Supply of wires (80% of item rate) <li>- Laying of wires (10% of item rate) <li>- Testing and commissioning (10% of item rate) <p>11.7.6 Part VI (Distribution System)</p> <p>(a) Supply and installation of panels / distribution boards</p> <ul style="list-style-type: none"> <li>- Supply of Panel / DB (85% of the item rate) <li>- Installation of panel / DB (10% of the item rate) <li>- Testing & commissioning of panel / DB (5% of the item rate) <p>(b) Supply of cables</p> <ul style="list-style-type: none"> <li>- Supply of cables (90% of item rate) <li>- Testing & commissioning (10% of item rate) <p>(c) Laying of cables</p> <ul style="list-style-type: none"> <li>- Laying of cables (90% of item rate) <li>Testing and commissioning (10% of item rate) 		
Technical Specifications - Internal Electrification		BIDDER

SECTION- V
FORM OF BID

SECTION V**FORM OF BID**

The Appendices (I to IV) of Form of Bid is a part of the bid. Bidders are required to fill up all the blank spaces in this Form of Bid and Appendices.

Bid Reference No. : **IDMC/ Sourcing & VD/ 2025-26/ Enquiry/ 290 Dated 21.08.2025**

Name and address of

Project Authority / Employer : IDMC Limited, Anand, Gujarat

Description of Works : ETP CAP EXPANSION FROM
MODIFICATION OF EXISTING CAP 100
KLD & NEW 200 KLD FOR DAIRY PLANT
AT PURVI DAIRY.

Dear Sirs,

- 1.0** Having examined the Drawings, Terms & Conditions of Contract, Technical Specifications and Schedule of Quantities for the execution of above mentioned works, we, the undersigned offer to execute, complete and maintain the whole of the said works in conformity with the said Drawings, Terms & Conditions of Contract, Technical Specifications and Schedule of quantities in accordance with the said conditions.
- 2.0** We undertake, if our bid is accepted, to commence the Works **within_____days** of receipt of the Letter of Acceptance, and to complete and deliver the whole of the above said works comprised in the Contract **within_____ (_____) months** calculated from the lastday of the aforesaid period in which the Works are to be commenced.
- 3.0** If our bid is accepted, we will furnish a performance security in the form of a bank guarantee (to be approved by you) / Demand draft, to be jointly and severally bound with us in **amount of 5%** of the above named sum in accordance with the Conditions of Contract.

4.0 We agree to abide by this bid for the period of **120 days** from the date of bid opening as prescribed in **clause 13** of the Instruction to Bidders, and it shall remain binding upon us and may be accepted at any time before the expiry of that period.

5.0 Unless and until an Agreement is prepared and executed, this Bid, together with your written acceptance thereof, shall constitute a binding Contract between us.

6.0 We understand that you are not bound to accept the lowest or any Bid you may receive.

Date _____

Signature of bidder with seal

Place _____

Witnesses:

1. Signature:

Name:

Address:

2. Signature:

Name:

Address:

APPENDIX – I (FORM OF BID)
Important Conditions of Contract

Sl. No.	Description	Vol-I SEC-II Clause No.	Remarks
1.	Amount of Performance Security	10	5 (Five) percent of Total contract value
2.	Minimum amount of Third Party Insurance	23	Such insurance shall be for 10% of the value of works with number of Occurrence unlimited.
3.	Minimum amount of insurance of work	21	110 (Hundred & ten) percent of contract value
4.	Period for Commencement, from the Date of Letter of Acceptance	41	15 (Fifteen) Days.
5.	Time for Completion	43	12 Months (Twelve Months).
6.	Rate of Liquidated Damages	47	0.5 (Zero point five) percent per week of total contract value
7.	Maximum Limit of Liquidated Damages	47	10 (Ten) percent of total contract value
8.	Rate of Bonus	48	NOT APPLICABLE
9.	Period of Maintenance (Defects Liability Period)	50	12 (Twelve) Months
10.	Percentage Recovery of Retention	60.3	10% (Ten)

Sl. No.	Description	Vol-I SEC-II Clause No.	Remarks
11	Maximum limit of Retention money	60.3	10% (Ten)
12.	Maximum amount of Secured Advance	60.2	(Not Applicable) percent for Structural Steel / 75 (Seventy-Five) percent for other materials.
13.	Maximum amount of Mobilisation Advance	60.5	Applicable, 20 (Twenty) percent
14.	Time within which the payment would be made after submission of measurement / bill	60	As per GCC/SCC
15.	Price Variation	71	Refer Clause 11.5 of Section I of this bidding document
16.	Contractor's Profit & Overhead Cost for settling extra items	53.1	15 (fifteen) percent

Date : _____

Signature of Bidder with Seal
Place: _____

APPENDIX – II (FORM OF BID)**BIDDING TERMS DEVIATION STATEMENT FORM**

1.) The following are the particulars of deviations from the requirements of the bidding conditions/ terms:

CLAUSE	DEVIATION	REMARKS (INCLUDING JUSTIFICATION)
---------------	------------------	--

The terms and conditions prescribed in the bidding document shall prevail over those of any other document forming a part of our bid, except only to the extent of deviations furnished in this statement.

Dated:_____

Signature and Seal of Bidder

Place: _____

Note :-

Where there is no deviation, the statement should be returned duly signed with an endorsement indicating “NO DEVIATIONS”.

APPENDIX – III (FORM OF BID)**TECHNICAL DEVIATION STATEMENT FORM**

- 1.) The following are the particulars of deviations from the requirements of the tender technical specifications:

CLAUSE	DEVIATION	REMARKS (INCLUDING JUSTIFICATION)
---------------	------------------	--

The technical specification furnished in the bidding document shall prevail over those of any other document forming a part of our bid, except only to the extent of deviations furnished in this statement.

Dated : _____

Signature and Seal of Bidder

Place: _____

Note :-

Where there is no deviation, the statement should be returned duly signed with an endorsement indicating “NO DEVIATIONS”.

APPENDIX - IV (FORM OF BID)
LIST OF SUGGESTED MAKES
(for Structural Steel Works, and other miscellaneous works)

The following is the suggested list of products and name of the manufacturer against each product. The contractor shall quote rates for the various items of works such that their rates should be valid for all makes suggested hereunder. It will be prerogative of IDMC LTD to approve any make out of this list or any other equivalent make. The makes specified in schedule of quantities shall have preference over the makes suggested hereunder. Wherever make is not suggested, the material should be as per relevant BIS specification.

SR. NO.	ITEM DESCRIPTION	SUGGESTED MAKES/MANUFACTURES
1.	ANTI CORROSIVE PRIMER	ASIAN OR EQUIVALENT CONFORMING TO IS – 2074
2.	WATER PROOFING COMPOUND	FOSROC/SIKA/CICO/PIDILITE/ ARALDITE/MYK SCHAUMBURG/BASF/STP/ CIBA
3.	EPOXY AND RESIN FLOORING CHEMICAL/ HARDNER/ CONCRETE ADMIXTURES/ ACID AND ALKALI RESISTANT POWDER	FOSROC/SIKA/CICO/PIDILITE/ ARALDITE/MYK SCHAUMBURG/BASF/STP/ CIBA
4.	STRUCTURAL STEEL & ALL MS ELEMENTS & PLATES	SAIL / TISCO / VIZAG (RINL)/JSPL/ JSW

SR. NO.	ITEM DESCRIPTION	SUGGESTED MAKES/MANUFACTURES
5.	PAINTS (PREMIUM QUALITY)	ASIAN / BERGER / J&N / SHALIMAR/ICI / NEROLAC/ SNOWCEM INDIA LTD.
6.	PU PAINTS (INTERNAL WALLS , EXTERNAL WALLS) , TERRACE SLAB PU COATINGS , INJECTION GROUTING CHEMICALS , FOAM ETC.	SIKA/FOSROC/BASF/ASIAN/BERGER/ FLOWCRETE
7.	MS PIPE	TATA/JINDAL /BST /QST /PRAKASH SURYA
8.	MS HOLLOW SECTION	TATA / DECCAN / JINDAL

SR. NO.	ITEM DESCRIPTION	SUGGESTED MAKES/MANUFACTURES
9.	STAINLESS STEEL.	SALEM / JINDAL/ RATNAMANI/ BHANDARI FOILS & TUBES/ HEAVY METALS/ NIKA TUBES/ APEX/ SUBHLAXMI/ RENSA
10.	UPVC PIPE / CPVC PIPE/ PVC/ ALL SPECIALS AND FITTINGS	FINOLEX/ SUPREME / ASTRAL / PRINCE/ JAIN
11.	POLYSULPHIDE SILICON SEALANT	FOSROC/SIKA/CICO/PIDILITE
12.	BITUMEN	IOC / HP / ISI MARKED OR EQUIVALENT APPROVED
13.	PREMOULDED BITUEMEN FREE FILLER BOARD	SUPREME / PARAMOUNT FOAM
14.	CI BUTTERFLY VALVE (IS13095)	AUDCO OR EQUIVALENT APPROVED

SR. NO.	ITEM DESCRIPTION	SUGGESTED MAKES/MANUFACTURES
15.	PU COATING	MRF/SHALIMAR/CIPY/ ASIAN/ ICI / STP
16.	PVC WATER TANK	SINTEX/ SUPREME
17.	STANDARD ROLLED STEEL SECTIONS /WINDOWS	AGEW (AHMEDABAD)/ SUPER STEEL (MUMBAI) / ANAND WINDOWS (NEW DELHI) / PERFECT (AHMEDABAD), EQUIVALENT
18.	HDPE PIPE (IS 14333)	RIL, JAIN, DUTRON, HASTI, NOBEL, SUPREME
19.	FRP/GRP GRATINGS	BALAJI/ERCON/EQUIVALENT

SR. NO.	ITEM DESCRIPTION	SUGGESTED MAKES/MANUFACTURES
20.	HDPE ELECTRO FUSION PIPE FITTINGS	INNOGAZ/FIRATAC/DURAFUSE/BENTLAY

NOTE:

- 1 For equivalent, ISI or approved marked items included above, if opted by contractor, specific approval to be taken by contractor for make, before procurement and use.
- 2 For the items not indicated above but to be used for ETP & structural works, specific approval to be taken before procurement and use after submitting sample, detail of manufacturer, source of supply etc.

WE HAVE NOTED THE ABOVE AND CONFIRM THAT OUR TENDER IS BASED ON ABOVE SUGGESTED MAKES.

Date:_____

Signature and Seal of Bidder

LIST OF SUGGESTED MAKES OF ELECTRICAL WORKS

The following is the list of products and names of the approved manufacturer against each product. The contractor shall quote rates for the various item of works using these products based on maximum two makes out of these approved manufacturers selected & filled up in format given below by the bidder. Any other make of product, not approved below, shall not be allowed for use in this work unless specifically approved in writing separately by purchaser after establishing its technical suitability, price availability & effect on price quoted by contractor for the item where this item is being used. If no make has been selected by the bidder, the purchaser shall be at liberty to advice the contractor to use any of the approved manufacturer given below for any product for this contract.

SR. NO.	ITEM DESCRIPTION	APPROVED MAKES
1.	PVC CONDUITS	PRECISION, POLYCAB, POLYPACK, BHARAT, SUDHKAR
2.	PVC CONDUIT ACCESSORIES	PRECISION, POLYCAB, POLYPACK, BHARAT, SUDHKAR
3.	PVC INSULATED, FLEXIBLE STRANDED COPPER CONDUCTOR FRLS WIRES	FINOLEX, RR KABEL (UNILAY), L&T, HAVELL'S, POLYCAB
4.	PVC INSULATED ARMOURED, ALUMINIUM CONDUCTOR CABLES	KEC, RPG-ASIAN, FINOLEX, NICCO, RR KABEL, CCI, POLYCAB, HAVELS
5.	MODULAR SWITCHES, SOCKET OUTLET & MOULDED COVER PLATES	MK ELECTRIC, CRABTREE, SCHEINDER, ANCHOR ROMA (PANASONIC), L&T, CLIPSAL, LK PACE (ENGLISH MODULE), ABB, HAVELS, SCHNEIDER
6.	MINIATURE CIRCUIT BREAKERS (M.C.B)	LEGRAND, L&T ,HAGER, SIEMENS, ABB, HAVELL'S (CRABTREE),
7.	EARTH LEAKAGE CIRCUIT BREAKERS (ELCB)/RESIDUAL CURRENT CIRCUIT BREAKER (RCCB)	LEGRAND, L&T ,HAGER, SIEMENS, ABB, HAVELL'S (CRABTREE),

SR. NO.	ITEM DESCRIPTION	APPROVED MAKES
8.	MOULDED CASE CIRCUIT BREAKERS (MCCB)	SIEMENS, L&T, ABB, MERLIN GERIN, LEGRAND, ENGLISH ELECTRIC, SCHNEIDER COMPACT NSX
9.	SWITCH FUSE UNITS WITH HRC FUSES FOR PANELS (TPN &TP)	L&T, SIEMENS, ABB, SCHNEIDER, ENGLISH ELECTRIC, TELEMCHANIC
10.	AMMETERS, VOLTMETERS, PF METERS (ANALOGUE)	AUTOMATIC ELECTRIC, L&T (RISHAB), MECO, IMP, SCHNEIDER
11.	AMMETERS, VOLTMETERS, PF METERS (DIGITAL)	L&T (RISHAB), SCHNEIDER, SIEMENS, L&T (RISHAB)
12.	CURRENT TRANSFORMERS (CAST RESIN)	KAPPA, GILBERT MAXWELL, AUTOMATIC ELECTRIC, MECO, BHARATI
13.	ENERGY METERS (MECHANICAL)	UNIVERSAL, JAIPUR, HAVELL
14.	ENERGY METERS (ELECTRONIC)	L&T, RISHAB, SCHNEIDER, SIEMENS REICO, SECURE, MECO, ICD, ELECON
15.	TELEPHONE WIRES & CABLES	FINOLEX, RR KABEL, POLYCAB, SKYTONE, L&T, DELTON
16.	COMPUTER DATA CABLES (CAT 5/6)	LUCENT, AT&T, AMP,D-LINK
17.	TELEPHONE TAG BOX	KRONE, POUYET
18.	LOW TENSION SWITCHGEAR	L&T, SIEMENS, ABB, SCHNEIDER
19.	CABLE COMPRESSION GLANDS	COMET, PEECO, DOWELL, LAPP KABEL
20.	CABLE LUGS	DOWELL'S, LAPP KABEL, COMET PEECO
21.	INDUSTRIAL TYPE METALLIC PLUG SOCKETS	LEGRAND, CUTTLER & HAMMER, SIEMENS,SCHNEIDER, INDO KOPP, CLIPSAL

SR. NO.	ITEM DESCRIPTION	APPROVED MAKES
22.	DISTRIBUTION BOARDS	LEGRAND , L&T (HAGER), SIEMENS, ABB, HAVELL'S (CRABTREE) , INDO KOPP, SCHNEIDER
23.	SELECTOR SWITCHES	KAYCEE, L&T SULZER
24.	INDICATION LAMPS (LED TYPE)	L& T SIEMENS, ABB, SCHNEIDER, ESSEN, BCH, VAISNAV, TECHNIC
25.	RISING MAINS	CONTROL & SWITCHGEAR, ZETA
26.	POWER CAPACITORS	ASIAN, EPCES, L&T,SCHNEIDER, MOMAYA, SEIMENS
27.	MS / GI CONDUITS	AKG, BEC, VIMCO, GUPTA, BHARAT
28.	MS / GI CONDUIT ACCESSORIES	SHARMA, RAMA
29.	TIMER	L&T / SEIMENS/ MINILEC
30.	CABLE TRAYS	PROFAB / UBITECH / TECHNOFAB /OBO/LEGRAND/FRASER
31.	LIGHT FITTINGS	PHILIPS / CG / WIPRO / BAJAJ
32.	EARTH ELECTRODE	ASHLOK / GRAVIN
33.	UPS	SCHNEIDER-APC / CONSUL NEOWATT / HIREL-HITACHI/ EMERSON
34.	CEILING FAN / ESHAUST FAN	ALMONARD / CROMPTON /HAVELLS/ ORIENT/ CROMPTON GREEVES
35.	BATTERY BACK UP KIT & EXIT SIGNAGES	BAJAJ/ CROMPTON/ COOPER
36.	FLAME PROOF SOCKETS, SWITCHES	BALIGA/ COOPER/CND HI TECH
37.	RACK	SCHNEIDER/ RITTAL/COMMSCOPE/ PANDUIT
38.	POP UP BOX/NET BOX	A&H MEYER/ LEGRAND

SR. NO.	ITEM DESCRIPTION	APPROVED MAKES
39.	TV CABLES	SKYTON/ FINOLEX/ DELTON
40.	TERMINAL BLOCKS	DOWELL'S/ ELEMEX/ WAGO/ PHOENIX
41.	ELECTRIC MOTORS	SIEMENS/ABB/BHARAT BIJLEE/CROMPTON/KIRLOSKAR/L&T
42.	AIR CIRCUIT BREAKER	L&T – U POWER OMEGA/ SIEMENS 3 WL / SCHNEIDER MASTERPACT NW SERIES/ ABB
43.	MCCB	L&T D' SINE / LEGRAND / SIEMENS 3 VL / MERLIN GERIN COMPACT SERIES/ ABB TMAX/ GE RECORD RANGE / HAGER/SCHNEIDER
44.	PROTECTION RELAYS	L&T / SIEMENS / ABB / AREVA T&D/ ASHIDA
45.	CONTACTORS	L&T / SIEMENS / ABB / SCHNIEDER/ GE
46.	TIMERS ELECTRONIC	L&T / SIEMENS / GE/ ABB/ SCHNIEDER
47.	SWITCH DIS-CONNECTOR FUSE UNITS	L&T / SIEMENS / ABB /SCHNIEDER/GE
48.	MCB/RCCB	LEGRAND/HPC/INDO KOPP/SIEMENS / HAGER / MERLIN GERIN / LEGRAND/ABB/ L&T/ GE/ SCHNIEDER/HAVELLS
49.	MCCB	L&T/ SIEMENS/ABB/LEGRAND/HAGER
50.	INDICATING LAMPS	L&T / SIEMENS / SCHNEIDER / VAISHNO / TEKNIC / ABB
51.	PUSH BUTTONS	ESBEE / SIEMENS / ABB / VAISHNO / TEKNIC/ L&T
52.	ISOLATORS	SIEMENS /ABB / BCH/ HAVELLS/
IDMC LTD		
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SR. NO.	ITEM DESCRIPTION	APPROVED MAKES
		L&T/HANSU/HENSEL/SINTEX
53.	LOAD MANAGER	SIEMENS/ ABB/ L&T / SCHNEIDER/ CONZERV/ ALLEN BRADLEY (ROCKWELL)
54.	DIGITAL AMMETER & VOLTMETER	CONZERV / L&T / RISHABH /AE/IMP/MECO
55.	ANALOG AMMETER & VOLTMETER	RISHABH / IMP / AE/ L&T/SCHNEIDER
56.	DIGITAL ENERGY METER	CONZERV / L&T / ABB/SIEMENS /HPCL/UNIVERSAL/JAIPUR/REIL
57.	PVC CONDUIT & ACCESSORIES	PRECISION / POLYCAB / CLIPSAL
58.	POWER FACTOR METER	RISHABH / IMP / MECO / AE/ L&T
59.	CURRENT TRANSFORMER	KAPPA / BHARTI/ ASHMORE/ L&T/RISHABH / AE /MAXWELL/IMP/MECO/GILBERT
60.	HT XLPE POWER CABLES	GLOSTER/ CCI / KEC / FINOLEX / NICCO /KEI
61.	LT XLPE POWER CABLES	GLOSTER/ CCI / KEC / FINOLEX /LAPP KABEL / NICCO /RR KABEL /SBEE
62.	LT COPPER CONTROL CABLES	LAPP KABEL / CONcab / CCI / RPG ASIAN / FINOLEX / RR KABELS/ SBEE/GLOSTER
63.	SIGNAL & INSTRUMENT CABLE	LAPP KABEL / CONcab /RR KABEL/SBEE/ DIGILINK
64.	POWER CAPACITORS	SIEMENS/ EPCOS / L&T/ ABB/ SCHNIEDER / GE/NEPTUNE-DUCATI
65.	APFC RELAY	BELUKE /SIEMENS / EPCOS / L&T/ ABB/ SCHNEIDER/ NEPTUNE-DUCATI/ GE
66.	CABLE TRAY	INDIANA / MEK / SUNRISE / SUPER /

SR. NO.	ITEM DESCRIPTION	APPROVED MAKES
		PILCO / SINTEX
67.	ISOLATING SWITCHES	SIEMENS/ABB/L&T/ SCHNEIDER
68.	HRC FUSES	L&T / SIEMENS / GE/ ABB /EE
69.	TERMINAL BLOCKS	WAGO / LAPP INDIA / CONNECT WELL/ ELMEX
70.	POTENTIAL TRANSFORMERS	KAPPA / JYOTI/ BHARTI/AE / ASHMORE
71.	ROTARY SELECTOR SWITCH	KAYCEE / SALZER - L&T / SIEMENS / ABB
72.	CABLE GLANDS	COMET / EX-PROTECTA / DOWELS / LAPP KABEL
73.	CABLE LUGS	DOWELS / COMET / LAPP KABEL/ BRACKO
74.	MECHANICAL INTERLOCK	L&T / SCHNEIDER / ABB/ GE/SIEMENS
75.	XLPE CABLE JOINTING / TERMINATING KIT	RAYCHEM / M-SEAL/BIRLA 3M
76.	PROGRAMMABLE PROTECTION RELAY	MINILEC/ ABB/ L&T/ SIEMENS/ SCHNIEDER/ GE
77.	LT SANDWICH BUS DUCT	L&T/ GE/ C&S/ SIEMENS/ ABB/ SCHNIEDER
78.	STEEL STRUCTURE	SAIL/ESSAR/TISCO/ JINDAL
79.	LT SWITCHGEAR	L&T/SIEMENS/ABB/ SCHNIEDER
80.	POWER / CONTROL CABLES, WIRES	CCI / GLOSTER/ FINOLEX/ UNIVERSAL/ NICCO/ RPG
81.	INDICATION LAMP LED TYPE	BINAY/ SIEMENS/ L&T/ TEKNIC/ ABB
82.	WEATHER PROOF BOXES FOR ISOLATORS, PUSH BUTTONS	HANSU/ HENSEL/ SINTEX

	AUTOMATION & CONTROLS	
83.	VFD	SIEMENS / ALLEN BRADLEY / DANFOSS / SCHNEIDER
84.	LEVEL TRANSMITTER & INDICATOR	E&H / EMERSON / SCIENTIFIC DEVICES
85.	TEMPERATURE / PRESSURE TRANSMITTER	E&H / EMERSON / ANDERSON NEGELE / BAUMER
86.	CONDUCTIVITY TRANSMITTER	E&H / EMERSON / ANDERSON NEGELE / BAUMER / JUMO
87.	DENSITY TRANSMITTER	E&H / EMERSON
88.	RTD FOR TANKS	E&H / EMERSON / ANDERSON NEGELE
89.	RTD FOR LINES	E&H / EMERSON / ANDERSON NEGELE / RADIX / GIC / JUMO
90.	FLOW SWITCH	E&H / ANDERSON NEGELE / BAUMER
91.	PROXIMITY SWITCH	SICK / P&F
92.	VORTEX / MAGNETIC FLOW METER	E&H / EMERSON

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SR. NO.	ITEM DESCRIPTION	SUGGESTED MAKES/MANUFACTURES	
93.	MASS FLOW METER	E&H / EMERSON	
94.	CONTROL VALVE	DANFOSS / SAMSON / TOSHBRO / FORBES MARSHALL-ARCA / AVCON / FISHER XOMOX/DEMBLA / BURKERT	
95.	PRESSURE SWITCH / TEMP SWITCH	DANFOSS / ALCO / HANSEN / PARKER / E&H/ EMERSON / ANDERSON NEGELE / IMF	
96.	PRESSURE & TEMPERATURE GAUGE	FIEBIG / H GURU / WAAREE / WIKA / PRICOL	
97.	DUAL TYPE PRESSURE / TEMP GAUGES	FIEBIG / H GURU / WAAREE / WIKA / PRICOL	
98.	TEMPERATURE DIGITAL INDICATOR / CONTROLLER	E&H / EMERSON / ANDERSON NEGELE / IFM/ RADIX / SICK / YOKOGAWA	
99.	LOAD MANAGER / POWER / ENERGY MONITOR	ROCKWELL/ SIEMENS / ABB / L&T / SCHNEIDER	
100.	PC (PERSONAL COMPUTER)	HP / DELL	
101.	NETWORK SWITCH	CISCO / D LINK / SIEMENS / ROCKWELL	
102.	DCS / PLC SYSTEM	SIEMENS / ROCKWELL/ SCHNEIDER/	
103.	AUTOMATION SYSTEM	SIEMENS / ROCKWELL/ SCHNEIDER	
	MECHANICAL & INSTRUMENTATION		
104.	PUMPS	JOHNSON / KIRLOSKAR/ GRUNDFOS / EBARA/ WILO	
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SR. NO.	ITEM DESCRIPTION	SUGGESTED MAKES/MANUFACTURES	
105.	MOTORS	SIEMENS / ABB / BHARAT BIJLEE/ CROMPTON / KIRLOSKAR	
106.	FAT REMOVAL UNIT	VOLTAS/ KUNAL ENVIRO ENGINEERS / ENVIRON ENGINEERING / PARAMOUNT LIMITED	
107.	SECONDARY CLARIFIER MECHANISM	VOLTAS/ KUNAL ENVIRO ENGINEERS / ENVIRON ENGINEERING/PARAMOUNT LIMITED	
108.	CROSS FLOW SEPARATOR	K PACK SYSTEM/APPROVED EQUIVALENT	
109.	DISC THICKENER	HUBER/APPROVED EQUIVALENT	
110.	REDUCTION GEAR BOX	RADICON/POWER BUILD/ESSENPRO/ELECON/ PREMIUM (GREAVES) /BONFIGLIOLI	
111.	ONLINE FLOW METERS & LEVEL SENSORS	E & H / EMERSON/ SCIENTIFIC DEVICES/ KROHNE MARSHALL	
112.	GFS TANK	ROSTFREI STEELS/ APPROVED EQUIVALENT	
113.	JET MIXER/EDUCTOR	PRIMETECH/KORTING HANNOVER AG	
114.	DOSING PUMPS	PROMINENT / MILTON ROY/PENTAIR	
115.	SLUDGE SCREW PUMPS	NETZSCH/SEEPEX	
116.	SUBMERSIBLE MIXER	SULZER (ABS)/GRUNDFOS/WILO/EBARA	
117.	DO SENSOR & ANALYZER	E&H/ EMERSON	
118.	PH. PROBES AND ANALYZER	E&H/ EMERSON/BAUMER	
IDMC		Form of Bid	BIDDER

SR. NO.	ITEM DESCRIPTION	SUGGESTED MAKES/MANUFACTURES
119.	LEVEL SENSORS WITH TRANSMITTER	E&H/EMERSON/SCIENTIFIC DEVICES
120.	TEMPERATURE SENSOR AND TRANSMITTER	JUMO/E&H/EMERSON/BAUMER/KROHNE MARSHALL
121.	BIOGAS FLOW METER	E&H/ COMBUSTION RESEARCH ASSOCIATES/ EMERSON/KROHNE MARSHALL
122.	PCV FLEXIBLE GAS HOLDER	ROSTFREI STEEL /APPROVED EQUIVALENT
123.	HOT WATER GENERATOR	THERMAX/HEATMAX/ ROSS THERMAL/FORBES MARSHALL/APPROVED EQUIVALENT
124.	HEAT EXCHANGER	HEATMAX/IDMC/KELVION/ALFA LAVAL/SPX
125.	BIOGAS BURNER	ECOFLAME/REILLO/FBR/OILLON/ WEISHAUP / FBR / ELCO-KLOCKNER
126.	TWIN LOBE AIR BLOWERS	EVEREST/KAY
127.	TRI LOBE AIR BLOWERS	IR/KAESSER/ GARDENER DENVER
128.	DIFFUSERS	REHAU/OTT
129.	AIR ROTA METER	SUNFLOW/EUREKA/FLOWTECH
130.	SLUDGE DEWATERING MACHINE- VOLUTE DEWATERING PRESS /SCREW PRESS	AMCON INC. /HUBER
131.	AUTO IGNITION SYSTEM OF FLARE STACK	COMBUSTION RESEARCH ASSOCIATES/APPROVED EQUIVALENT
IDMC		Form of Bid
		BIDDER

SR. NO.	ITEM DESCRIPTION	SUGGESTED MAKES/MANUFACTURES
132.	FLAME ARRESTOR	PRESSURE FLOW CONTROL (PRECON)/COMBUSTION RESEARCH ASSOCIATES
133.	PVRV	PRESSURE FLOW CONTROL (PRECON)/COMBUSTION RESEARCH ASSOCIATES/
134.	MANOMETER	CONTROL DEVICE/TELELIN/PUNE TECHTROL
	PIPING	
135.	HDPE PIPES	JAIN/RIL/HASTI/DUTRON/SUPREME/ NOBLE.
136.	GI & MS PIPES- C CLASS	JINDAL/TATA
137.	SS-304 PIPES SCH-10 & SS 316	SUMITOMO / NIPPON / JINDAL
138.	CPVC/UPVC/PVC PIPES, VALVES & FITTINGS	FINOLEX/RIL/HASTI/DUTRON/JAIN/NOBLE
139.	BUTTERFLY VALVES/BALL VALVES/SLUICE VALVE	L&T(AUDCO) /INTERVALVE/DELVEL/ZOLOTO
140.	HP / LP STEAM / CONDENSATE GLOBE VALVES	L&T / SPIRAX / FORBES MARSHALL / ARMSTRONG, USA / LEADER / THERMAX /UNIKINGER
141.	NRV	L&T (AUDCO)/INTERVALVE/DELVEL/ZOLOTO
142.	PRESSURE GAUGES	WAREE/H GURU
143.	ELECTRO FUSION WELDING- ALL FITTINGS	INNOGAZ/FRIATEC/DURAFUSE/BENTLAY
IDMC		Form of Bid
		BIDDER

Note:

The following shall be got approved from Purchaser:

1. Samples of Conduit, conduit bends & junction box.
2. Samples of Switch box and outlet box with hylem sheet cover & switches.
3. Drawings & inspection for following:
 - i. Distribution boards
 - ii. Electrical switch boards
 - iii. Street light poles & brackets.
 - iv. Galvanised Raceways & its junction box.
 - v. Flood light Tower
4. Samples for modular switches, sockets, grid & cover plate and their boxes.
5. Samples for telephone & computer data outlet box & outlet.
6. Samples of GI wires and strips.
7. All Electrical works shall be carried out by a licensed electrical contractor possessing a valid electrical contractors license in the state where site is located, employing licensed supervisor & skilled workers having valid permits as per the regulations of Indian Electricity Rules and local Electrical Inspector requirements. Copy of contractor s electrical license shall be furnished along with the tender.

Date _____

Signature & Seal of Bidder

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SECTION- VI
SCHEDULE OF MATERIAL
TO BE ISSUED

SECTION VI**SCHEDULE OF MATERIAL TO BE ISSUED BY
SERVICE RECIPIENT /IDMC**

No material shall be issued by Service Recipient/IDMC unless otherwise specified in the bidding document. All the materials/goods & services are to be arranged by the bidder/contractor for proper completion of the works as per specification, terms & conditions of the bidding document/contract.

SECTION- VII

**SCHEDULE OF SUPPLEMENTARY
INFORMATION**

SECTION - VII, SCHEDULE OF SUPPLEMENTARY INFORMATION

The bidder shall provide the Supplementary Information as Annexed in the form of schedules mentioned hereunder. All these supplementary information shall be considered for the bid evaluation and same in the contract execution. If the requisite information is not supplied by the bidder then the bid may be considered non-responsive and shall be rejected.

a)	Schedule	I	Major items of construction plant to be deployed by the bidder.
b)	Schedule	II	Key Personnel.
c)	Schedule	III	Nominated Sub-Contractors.
d)	Schedule	IV	Major works successfully completed during the last five years.
e)	Schedule	V	Statement of Bonus earned/ Liquidity damages paid in the last five years.
f)	Schedule	VI	Statement of Arbitration & Disputes in the last five years.
g)	Schedule	VII	Financial Business Capability.
h)	Schedule	VIII	Works in hand

SECTION – VII, SCHEDULE – I
Major items of Constructional plant to be deployed by the bidder.

Sl. No.	Description	Specification/Capacity	Machinery Proposed To Be Deployed At Site By Contractor	
			Owned	To Be Hired
1.	Survey Equipment			
	Total Station With Accessories			
	Auto Level With Staff			
2.	Earth Moving Equipment			
	Backhoe Loader (JCB)	Shovel Capacity :		
	Breaker For Above			
	Poclain With Hydraulic Chisel /Breaker	Bucket Capacity :		
	Front End Loader	Bucket Capacity :		
	Reversible Plate Earth Compactor			
	Plate Earth Compactor			
	Tamping Rammer			
	Water Sprinkling System			
3.	Lifting Equipment			
	Tower Crane			
	Hoist			
	Mobile Crane/Hydra	Capacity :		
4.	Concreting Equipment			

Sl. No.	Description	Specification/Capacity	Machinery Proposed To Be Deployed At Site By Contractor	
			Owned	To Be Hired
	PLC Controlled Batching Plant With Printing Facility Of Batching Slip & Cement Silos	Machine Capacity = 15cum/Hr		
		Machine Capacity = 25cum/Hr		
		Machine Capacity = 30cum/Hr		
	Concrete Pump	Suitable For Pumping Concrete Upto 50mtr Vertical Height & 100mtr Horizontal Length		
	Boom Placer	Upto Horizontal Reach 40m		
	Transit Mixers	Capacity=		
	Concrete Mixer With Hopper	Batching Capacity = 1 Bag Cement ; Machine Capacity =		
	Vibrator Machine Electric Operated			
	Vibrator Machine Diesel Operated			
	Vibrator Needles	60mm Dia.		
		40mm Dia.		
		25mm Dia.		
	VDF Kit			
	Screed Vibrator			
	Power Trowel			
	VDF Mat			
5.	Building Work Equipment			
	Mortar Mixtures (For Mortar Making)	Capacity : Min. 1 Bag		
	Bar Bending Machine	Upto 32mm Dia		
	Bar Cutting Machine	Upto 32mm Dia		
	Chase Cutting Machine			

Sl. No.	Description	Specification/Capacity	Machinery Proposed To Be Deployed At Site By Contractor	
			Owned	To Be Hired
	Rotary Sans Screening Machine			
	Marine Densified Plywood Shuttering (New)	Min. – 600 sqm.		
	Steel Shuttering Plates	Min. – 600 sqm		
	Scaffolding	Min. – 1200 sqm		
	Grinding Machine			
	Hammer Drilling Machine			
	Welding Machine			
	Air Compressor			
	Concrete Breakers			
	De Watering Pumps			
6.	Road Work Equipment			
	Tandem Vibratory			
	Smooth Wheeled Roller 8-10 MT			
	Hot Mix Plant			
7.	Transportation Equipment			
	Hydraulic Dumpers			
	Trucks /Tractor With Trolley			
	Wheel Borrow			
	Tough Rider			
8.	De Watering Equipment			
	De Watering Pump	_____HP		
9.	Power Equipment			

Sl. No.	Description	Specification/Capacity	Machinery Proposed To Be Deployed At Site By Contractor	
			Owned	To Be Hired
	DG Set	_____KVA		
10.	Piling Equipment's (not applicable)			
	Percussion/Rotary Drilling Rigs Using Direct/Reverse Mud Circulation			
	TMR/ Bailer & Chisel Rigs.			
	Winch			
	Derrick			
	Boring/Chiselling Tools			
	Temporary Casings	Pipes-		
11.	Tremie Arrangements (not applicable)			
		Concrete Hopper-		
		Hopper Plugs-		
		Tremie Pipe-		
		Holding Clamps-		
		Hoisting Plug-		
	Accessories Like Concrete Placer, Wheel Barrow, Measuring Chain, Bailers, Crow Bars, Dog Clamps With Pins, Steel Measuring Tapes, Mucking Shovel Etc.- 1 Lot			

Note:- Bidder to submit the documents pertaining to ownership of equipment owned by them.

Signature and seal of Bidder

SECTION - VII, SCHEDULE – II, KEY PERSONNEL

1.	Technical Personnel Requirement	No. of persons employed with the bidder	No. of persons to be deployed for the project.
	a) Senior Engineer (Project Manager)- 1 no.		
	b) Site Engineer (Degree holder)- 1 no.		
	c) Billing Engineer (Degree holder)- 1 no.		
	d) Quality control engineer-1 no.		
	e) Electrical engineer – 1 no.		
	f) Safety engineer – 1 no.		
2.	Supervisory Personnel		
	a) Supervisor (Diploma holders)		
	b) Foremen		
	c) Technicians		
3.	Other key staff		

Signature and seal of Bidder

SECTION - VII, SCHEDULE – III, Nominated Sub-contractor

(List of works of value more than 10% of the contract value proposed to be sublet)

Sl. No.	Description	Approx. Value Rs.	Name of the Sub-contractor	Place where similar works previously executed.
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Signature and seal of Bidder

SECTION - VII, SCHEDULE – IV

Major similar nature of works successfully completed during the past five years:

Similar nature of work means Civil works of industrial buildings in Dairy/ Food or Beverage/Pharma/ Chemical/ Electronics/Frozen Semen station having clean room laboratory/Bio-Containment Laboratory/Bio-Gas/ETP plant having similar finishes, flooring, drainage including or excluding internal electrification works etc. during the last five years.

Sr. No.	Name of work	Place	Contract Ref.	Name of Client	Value of Work	Time of Completion	Date of Completion
---------	--------------	-------	---------------	----------------	---------------	--------------------	--------------------

Note: Documentary evidence for above information to be attached separately in the form of completion certificate, purchase order, TDS certificate , details of payments etc. issued by the client.

Signature and seal of Bidder

SECTION - VII, SCHEDULE - V

Statement of Bonus earned/ Liquidity damages (L.D.) paid in the past five years :

S. N.	Name of Work	Place	Contr- act ref.	Name of Owner	Valu e of Work (Rs. Lakh)	Time of Completion (Months)		Bonus / L.D.
						Contract	Actual	

Signature and seal of Bidder

SECTION - VII, SCHEDULE – VI**Statement of Arbitration & disputes in the last five years.**

S. N.	Name of Work	Place	Contract reference	Name of Client	Value of Work (Rs. Lakh)	Nature of Dispute	Award of Arbitration
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Signature and seal of Bidder

SECTION - VII, SCHEDULE – VII
Financial and business Capability.

1. Audited annual accounts/ Accounts :
audited under section 44AB of Income
Tax Act of past 3 years
2. Where accounts are not required to be :
audited following information shall be
given for last three years duly attested
by a Chartered Accountant/ Manager of
nationalised Bank.
 - a. Share Capital :
 - Free Reserves :
 - Other Reserves :
 - b. Term loans from financial institutions & :
banks
 - c. Current Liabilities :
 - Bank Cash Credits :
 - Others (Including sundry creditors) :
 - d. Provisions :
 - e. Contingent Liabilities including claims :
not acknowledged
 - f. Fixed Assets :
 - Gross :
 - Net :
 - g. Cash and Bank Balances :
 - h. Inventories :
 - i. Debtors & Advances considered good

- More than 6 months :
- Less than 6 months :
- j. Profit before tax :
- k. Loss, if any :
3. Other information
- Name of the Bankers :
- Bank facilities including credit limits :
4. Projected turn over for the next two years
- Year 1 :
- Year 2 :

NOTE:

Wherever required documentary evidence may be attached separately.

Signature and seal of Bidder

SECTION - VII, SCHEDULE - VIII, WORKS IN HAND

[illegible]

SECTION- VIII
FORM OF AGREEMENT

SECTION VIII-FORM OF AGREEMENT FOR CIVIL CONSTRUCTION WORK

(To be submitted by successful bidder after award of contract On Non-Judicial Stamp Paper of minimum value of Rs. 300/- or as per stamp act of Local State Government)

THIS AGREEMENT is made and executed at Anand on the _____ day of _____ 20____ between the IDMC Limited, having its registered office at Anand-388121,

_____ (hereunder referred as 'Service Recipient') name of the project authority) which expression shall, unless repugnant to the context or meaning thereof, include the successors and assignees of the pure agent) of the ONE PART and

_____ (herein after referred to as the **Contractor**, which expression, shall, unless repugnant to the ~~context or meaning thereof, include the heirs, successors, assignees, executors and administrators of the Contractor~~) of the OTHER PART.

WHEREAS the service recipient is desirous that certain Works should _____ be _____ executed, viz

_____ and has, by Letter of Acceptance/Work Order Acceptance dated _____, accepted a bid by the Contractor in response to the Pure Agent's bidding document ref no. _____ for carrying out the above job at a cost Rs. _____ (hereinafter referred as contract price), **NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:**

1.0 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.

2.0 The following documents shall be deemed to form and be read and construed as a part of this agreement, viz

i) This Form of Agreement

- ii) The Letter of Acceptance/Work Order Acceptance
- iii) The said bid and Appendix
- iv) The Schedule of Quantities
- iv) The Technical Specifications
- v) The Drawings
- vii) The Schedule of Supplementary information
- viii) Special Conditions of Contract
- ix) General Conditions of Contract
- x) Schedule of Materials to be issued by Project Authority/Pure Agent
- xi) Form of Bank Guarantees
- xii) Work Order No. _____

3.0 The aforesaid documents shall be taken as complementary and mutually explanatory of one another, but in the case of ambiguities and discrepancies shall take precedence in the order set out above.

4.0 In the consideration of the payment to be made by the Pure Agent to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Pure Agent to execute, complete and maintain the works in conformity in all respects with the provisions of the Contract and bidding document.

5.0 The Pure Agent hereby covenants to pay the Contractor in consideration of the execution, completion and maintenance of the works the Contract Price at the times and in the manner prescribed by the Contract.

IN WITNESS WHEREOF the parties hereto have caused this agreement to be executed in accordance with their respective laws the day, month and year first above written.

Signed, sealed & delivered by the
Authorized Signatory for the
Pure Agent

Signed, sealed & delivered
by the Authorized
Signatory for the
Contractor

Authorized Signatory
IDMC Limited

Authorized Signatory
Contractor

(In the capacity of Pure Agent to _____
_____ Project Authority Name

In the presence of:

WITNESS

1) Signature
Name
Address

2. Signature
Name
Address

In the presence of:


WITNESS

1. Signature
Name
Address

2. Signature
Name
Address

SECTION IX**Acceptable Forms of Bank Guarantees****Table of contract**

S. No.	Description	Sequential Page No.
1.0	Performance Security	IX-2 to 4
2.0	Bid Security	IX-5 to 7
3.0	Advance payment	IX-8 to 10
4.0	Retention money	IX-11 to 13
5.0	Solvency Certificate	IX-14

		Section IX		Page - IX - 2	
1.0 Bank Guarantee to secure performance (to be executed on stamp paper of appropriate value - usually Rs. 100/-)					
Currency: INR / EURO / USD		Amount in figures			
Amount in words					
Date of execution				Date up to when in force/ Date of expiry	
Date of Claim/ Demand (up to 45 days beyond the date of expiry)					
Name and address of beneficiary		IDMC Limited, Plot no. 124-128, GIDC Estate, Vithal Udyognagar, District Anand, Gujarat -388121			
Name and address of the vendor and/ or service provider (i.e. purchaser of the bank guarantee from the bank)					
<p>THIS deed of guarantee made on this _____ day of _____, 2025 between _____ (name of the bank issuing this guarantee), herein after called 'the bank', on the first part and _____ (hereinafter referred to as 'vendor and/ or service provider in relation to IDMC Limited' and 'purchaser in relation to the bank' respectively) on the second part.</p> <p>WHEREAS, the purchaser of the bank guarantee has been engaged by IDMC Limited as a vendor and/ or service provider for _____ (e.g. design, manufacture and supply of equipment or installation/ testing/ commissioning/ job work/ preventive maintenance/ break-down maintenance/ consulting or advising services as envisaged in purchase order(s)/ contract(s) _____ dated _____) which is required to be performed in pursuance of the said purchase order(s)/ contract(s);</p> <p>WHEREAS, the vendor and/ or service provider is required to submit this bank guarantee for a sum of Rs. _____ (Rupees _____ only) as security for fulfilling its obligation to secure performance of the _____ (description of goods and/ or services) under the said purchase order(s)/ contract(s).</p> <p>AND WHEREAS, at the request of the vendor and/ or service provider, the bank has agreed to guarantee the refund of the said amount in case the</p>					
IDMC Ltd.		Acceptable Form of Bank Guarantees		BIDDER	

aforesaid goods and/ or services do not perform to the satisfaction of IDMC Limited as per the terms and conditions of the said purchase order(s)/ contract(s).

NOW THIS DEED OF GUARANTEE DOES WITNESSETH AS UNDER:

1. That in consideration of IDMC Limited having awarded the said purchase order(s)/ contract(s), the bank does hereby irrevocably guarantee and indemnify that if the vendor and/ or service provider has supplied and/ or provided _____ (description of goods and/ or services), which is not to the satisfaction of IDMC Limited, as per the details, terms and conditions contained in the said purchase order(s)/ contract(s), *supra*, the Bank shall, without demur, repay and indemnify IDMC Limited within seven (7) working days as the bank may be called upon to pay subject to a ceiling of Rs. _____ (Rupees _____);
2. We, _____ (name of the bank), further agree that this performance guarantee will remain in full force and effect up to _____ by which duration IDMC Limited believes it may be reasonable to certify that the defect liability period has been successfully completed as per the details contained in the purchase order(s)/ contract(s), *supra*.
3. That the bank shall not question any of the details, terms and conditions contained in the said purchase order(s)/ contract(s), *supra*, including but not limited to the amount of consideration agreed upon between IDMC Limited and the vendor and/ or service provider for the purposes of determining its acceptance of liabilities under this bank guarantee and forthwith accept the demand of IDMC Limited to determine this bank guarantee;
4. That at the written request of either IDMC Limited or the vendor and/ or service provider, the bank shall renew this bank guarantee before it's date of expiry.
5. That the Bank agrees that the amount hereby guaranteed shall be immediately due and payable to IDMC on serving the bank with a notice before the date of expiry or date of claim/ demand, whichever is earlier. The claim can be lodged by IDMC limited up to 45 days beyond the date of expiry or extended date of expiry.
6. This Bank Guarantee shall be subject to the law as applicable in India.
7. Notwithstanding anything stated herein before:

- (i) The Bank's liability under this guarantee is restricted to Rs. _____/-(Rupees _____ only);
- (ii) This guarantee shall remain in force till _____ and;
- (iii) The Bank is liable to pay the guaranteed amount or any part thereof under this bank guarantee only if IDMC Limited serves upon the Bank a written claim/ demand on or before _____ (Date of Claim/ Demand) including 45 days of grace period from date of expiry.

IN WITNESS WHEREOF, the bank has signed on this _____ day of _____, 2023.

Signature of Bank Manager

2.0 Form of Bank Guarantee for Bid security (On the Non-Judicial Stamp paper of Rs. 100 minimum or as per the stamp act of Local State Government).

Bank Guarantee No:

Date:

This deed of guarantee made this _____ day of _____ (two thousand and _____) by (Name and the address of the Bank), hereinafter referred to as the Bank, which shall unless repugnant to the context and the meaning thereof includes its legal representatives, successors and assignees and the IDMC Limited ,(hereinafter referred to as the IDMC Limited) which expression shall unless repugnant to the context and meaning thereof include its legal representative, successors or assignees.

Whereas the IDMC Limited has invited bids for the Construction of the proposed _____ by the Invitation to bid no. _____.

AND WHEREAS M/s _____ (Name and the Address of the bidders) who having submitted their bids (hereinafter referred to as the bidder) and have agreed to deposit to the IDMC Limited an amount indicated in the Invitation to bid as per the terms and the conditions of the bidding documents.

AND WHEREAS the IDMC Limited is also willing to accept a Bank guarantee in lieu of payment by demand draft of an amount equivalent to the amount of bid security required to be deposited by the bidder to the IDMC Limited and the guarantee shall be kept valid for 120 days after the day of the opening of the bids.

In consideration of the IDMC Limited having agreed to consider the bid proposals having submitted by the bidder without depositing the amount of bid security and against this Bank guarantee, we (name and the address of the Bank) hereby undertake and guarantee to make payment to the IDMC Limited the amount of bid security or any part thereof not deposited by the bidder to the IDMC Limited at any time (time being the essence of the Contract) when the IDMC Limited asks for the same as per the terms and the conditions of the bidding documents within 120 days from the date of opening of the bids.

The Bank further undertakes not to revoke this guarantee during its currency except with the previous consent of the IDMC Limited in writing and the guarantee shall be continuous and irrevocable guarantee up to a sum of Rs. _____ (Rupees _____ only) provided always that any indulgence or forbearance on the part of the IDMC Limited to the said bidder, with or without the consent of the Bank shall not

IDMC Ltd.

Acceptable Form of Bank Guarantees

BIDDER

prejudice or restrict remedies against the bank nor shall the same in any event be a ground of defence by the Bank against the IDMC Limited.

In case the IDMC Limited puts forth a demand in writing on the Bank for the payment of the amount in full or in part against this Bank guarantee, the Bank will consider without demur that such demand by itself is a conclusive evidence and proof that the bidder has failed in complying with the terms and conditions stipulated by the IDMC Limited in its bidding document and payment will be made to the without raising any disputes regarding the reasons for such failures on the part of the bidder.

The Bank shall not be discharged or released from this guarantee by any arrangement between the bidder and the IDMC Limited with or without the consent of the Bank or any alterations in the obligations of the parties or by an indulgence, forbearance shown by the IDMC Limited to the bidder.

This guarantee shall be in addition to and without prejudice to any other securities or remedies which the IDMC Limited may have or hereafter possess against the bidder and the IDMC Limited shall be under no obligations to marshal in favour of the Bank any such securities or fund or assets that the IDMC Limited at its absolute discretion may vary, exchange, renew, modify or refuse to complete or enforce or assign any security or instrument.

The Bank agrees that the amount hereby guaranteed shall be due and payable to the IDMC Limited on serving us with a notice before expiry of Bank Guarantee requiring the payment of the amount and such notice shall be deemed to have been served on the Bank either by actual delivery thereof to the Bank or by dispatch thereof to the Bank by registered post at the address of the Bank.

In order to give full effect to the provisions of this guarantee the Bank thereby waives all rights inconsistent with the above provisions and which the Bank might otherwise as a guarantor be entitled to claim and enforce.

The guarantee shall remain in force until _____ and the Bank undertakes to renew the Bank Guarantee provided the request is made by the bidder before the expiry of Bank Guarantee.

Notwithstanding anything stated hereinbefore:(I) our liability under this guarantee is restricted to Rs. _____ (Rupees _____ only) (ii) The bank guarantee shall remain in force till _____ and (iii) The bank is liable to pay the guarantee amount or any part thereof under this bank guarantee only if the IDMC Limited serves upon the Bank a written claim or demand on or before _____.

Place

Signature

Date:

Bank Seal

Bank Code no.

Note :

- (i) **Bidders should ensure that the seal and code no. of signatory is put by the Bankers, before submission of the Bank guarantees.**
- (ii) **The value of stamp duty should be minimum Rs. 100 or as per latest stamp act of Local State Government, from where the bank guarantee is issued.**

Bank Guarantee to secure advance

(to be executed on stamp paper of appropriate value - usually Rs. 100/-)

Currency: INR / EURO / USD	Amount in figures	
Amount in words		
Date of execution		Date up to when in force/ Date of expiry
Date of Claim/ Demand (up to 45 days beyond the date of expiry)		
Name and address of beneficiary	IDMC Limited, Plot no. 124-128, GIDC Estate, Vithal Udyognagar, District Anand, Gujarat -388121	
Name and address of the vendor and/ or service provider (i.e. purchaser of the bank guarantee from the bank)		

THIS deed of guarantee made on this _____ day of _____, **2025** between _____ (name of the bank issuing this guarantee), herein after called 'the bank', on the first part and _____ (hereinafter referred to as 'vendor and/ or service provider in relation to IDMC Limited' and 'purchaser in relation to the bank' respectively) on the second part.

WHEREAS, the purchaser of the bank guarantee has been engaged by IDMC Limited as a vendor and/ or service provider for _____ (e.g. design, manufacture and supply of equipment or installation/ testing/ commissioning/ job work/ preventive maintenance/ break-down maintenance/ consulting or advising services as envisaged in purchase order(s)/ contract(s) _____ dated _____) which is required to be supplied/ provided latest by _____ (dd/mm/yyyy) in pursuance of the said purchase order(s)/ contract(s)

WHEREAS, IDMC Limited is required to pay the vendor and/ or service provider a sum of Rs. _____ (Rupees _____ only) against submission of this bank guarantee towards part value of _____ (description of goods and/ or services) ordered to be manufactured/ supplied/ provided under the said purchase order(s)/ contract(s);

IDMC Ltd.**Acceptable Form of Bank Guarantees****BIDDER**

AND WHEREAS, at the request of the vendor and/ or service provider, the bank has agreed to guarantee the refund of the said amount, in case the aforesaid goods and/ or services do not deliver to the satisfaction of IDMC Limited as per the terms and conditions of the said purchase order(s)/ contract(s).

NOW THIS DEED OF GUARANTEE DOES WITNESSETH AS UNDER:

1. That in consideration of IDMC Limited having agreed to pay an advance of Rs. _____ (Rupees _____) to the vendor, the bank does hereby irrevocably guarantee and indemnify that if the vendor and/ or service provider fails to supplies/ provides to IDMC Limited the goods and/ or services as per the details, terms and conditions contained in the said purchase order(s)/ contract(s), *supra*, the Bank shall, without demur, repay and indemnify IDMC Limited within seven (7) working days all such advances paid by IDMC Limited to the vendor and/ or service provider as the bank may be called upon to pay subject to a ceiling of Rs. _____ (Rupees _____);
2. That the guarantee furnished herein shall be realised and discharged the moment the vendor and/ or service provider supplies/ provides the equipment to the satisfaction of IDMC Limited, as per the details, terms and conditions contained in the said purchase order(s)/ contract(s);
3. That the bank shall not question any of the details, terms and conditions contained in the said purchase order(s)/ contract(s), *supra*, including but not limited to the amount of consideration agreed upon between IDMC Limited and the vendor and/ or service provider for the purposes of determining its acceptance of liabilities under this bank guarantee and forthwith accept the demand of IDMC Limited to determine this bank guarantee;
4. That at the written request of either IDMC Limited or the vendor and/ or service provider, the bank shall renew this bank guarantee before it's date of expiry.
5. That the Bank agrees that the amount hereby guaranteed shall be immediately due and payable to IDMC on serving the bank with a notice before the date of expiry or date of claim/ demand, whichever is earlier. The claim can be lodged by IDMC limited up to 45 days beyond the date of expiry or extended date of expiry.
6. This Bank Guarantee shall be subject to the law as applicable in India.
7. Notwithstanding anything stated herein before:

- a. The Bank's liability under this guarantee is restricted to Rs._____/-(Rupees_____ only);
- b. This guarantee shall remain in force till _____and;
- c. The Bank is liable to pay the guaranteed amount or any part thereof under this bank guarantee only if IDMC Limited serves upon the Bank a written claim/ demand on or before_____
(Date of Claim/ Demand) including 45 days of grace period from date of expiry.

IN WITNESS WHEREOF, the bank has signed on this _____ day
of _____, 2025.

Signature of Bank Manager

4.0 Form of Bank Guarantee for Retention Money (on Non-judicial Stamp Paper of Rs. 100 minimum or as per stamp act of local state Govt.)

Bank Guarantee no.

Date:

This deed of guarantee made this _____ day of _____ (two thousand _____) by _____ (Name and the address of the Bank), hereinafter referred to as "the Bank", which express where the context and the meaning so require, include its legal representatives, successors and assignees of the bank and IDMC Limited, (hereinafter referred to as the IDMC Limited) which expression shall unless repugnant to the context and the meaning thereof include its legal representative, successors and assignees.

WHEREAS the IDMC Limited has placed its Contract order bearing no. _____ dated _____ on (name and address of the party) hereinafter called the Contractor, for the construction of _____

AND WHEREAS the IDMC Limited has agreed to pay to the Contractor the retention money i.e. **10% of the value of the Contract** on submission of a Bank guarantee of equal amount, which will be kept valid up to _____.

In consideration of the IDMC Limited having agreed to pay to the Contractor Rs. _____ (Rupees _____ only) being the retention money we (the Bank), hereby undertake and guarantee to make repayment to the IDMC Limited of the said amount without any demur or any part thereof which does not become payable to the Contractor by the IDMC Limited in accordance with and subject to the terms and conditions of the said Contract. The Bank further undertakes not to revoke this guarantee during its currency except with the previous consent of the IDMC Limited in writing and this guarantee shall be a continuous and irrevocable guarantee up to a sum of Rs. _____ (Rupees _____ only).

The Bank shall not be discharged or released from this guarantee by any arrangement between the Contractor and the IDMC Limited with or without the consent of the Bank or any alterations in the obligations of the parties or by an indulgence, forbearance shown by the IDMC Limited to the Contractor and the same shall not prejudice or restrict remedies against the Bank nor shall the same in any event be a ground of defence by the Bank against the IDMC Limited. We (name of bank) do hereby undertake to pay an amount equal to Rs. _____ being the amount due and payable under

IDMC Ltd.

Acceptable Form of Bank Guarantees

BIDDER

this guarantee without any demur, merely on a demand from the IDMC Limited stating that the amount claimed is due to the IDMC Limited. In case, the IDMC Limited puts-forth a demand in writing on the bank for the payment of amount in full or in the part against this bank guarantee, the bank shall consider that such demand by itself is conclusive evidence and proof that the contractor has failed in compliance with the terms and conditions stipulated by IDMC Limited in the contract and payment shall be made to IDMC Limited without raising any dispute regarding the reasons for any such lapse/ failure on the part of the contractor.

This guarantee shall be in addition to and without prejudice to any other securities or remedies which the IDMC Limited may have or hereinafter possess in respect of the works executed or intended to be executed and the IDMC Limited shall be under no obligation to marshal in favour of the bank any such securities or funds or assets that the IDMC Limited may be entitled to receive or have a claim upon and the IDMC Limited at its absolute discretion may vary, exchange, renew, modify or refuse to complete to enforce or assign any security or instrument.

The Bank agrees that the amount hereby guaranteed shall be due and payable to the IDMC Limited on IDMC Limited's serving us with a notice before expiry of Bank Guarantee requiring the payment of the amount and such notice shall be deemed to have been served on the Bank either by actual delivery thereof to the Bank or by dispatch thereof to the Bank by registered post at the address of the said Bank.

We, _____, undertake to renew the bank guarantee provided the request for renewal is made by the contractor before the expiry of bank guarantee.

In order to give full effect to the provisions of this guarantee the Bank hereby waives all rights inconsistent with the above provisions and which the Bank might otherwise as guarantor be entitled to claim and enforce.

Notwithstanding anything stated herein before : (I) our liability under this guarantee is restricted to Rs. _____ (Rupees _____ only), (ii) The guarantee shall remain in force till _____ and (iii) The Bank is liable to pay the guarantee amount or any part thereof under the bank guarantee only if the IDMC Limited serves upon the Bank a written claim or demand on or before_____.

Place

Signature

Date

Bank Seal

IDMC Ltd.**Acceptable Form of Bank Guarantees****BIDDER**

Bank Code no.

Note:

- 1: Contractor should ensure that the seal and code no. of signatory is put by the Bankers, before submission of the Bank guarantees.**
- 2: The value of stamp duty should be minimum Rs. 100 or as per latest stamp act of Local State Government from where the Bank Guarantee is issued.**

5.0 Format of Solvency Certificate (On the letter head of issuing bank)

Ref:

Date:

**FORMAT OF SOLVENCY CERTIFICATE FROM THE NATIONALISED /
SCHEDULED BANK / FOREIGN BANKS OPERATING IN INDIA**

This is to certify that to the best of our knowledge & information M/s. / Shri _____ having the address as _____ per bank records as _____,

a customer of our bank is respectable and can be rated as good for any engagement upto a limit of Rs. _____ (Rupees _____).

The certificate is issued without any guarantee and responsibility on behalf of the bank or any of its Officers.

Date _____

(Signature)

(Name & designation of the officer with
address of Bank & its branch code)

(Bank's Official Rubber Stamp)

SECTION – X

SCHEDULE OF QUANTITIES

**Mechanical & Modification
/Interconnecting Piping &
Valves/Electrical Works**

DETAILED BOQ OF SUPPLY

S. N.	DESCRIPTION		Specifications / Size	Material / Tape	MOC/Make	Unit	QTY.
A.	Supply of Mechanical /Interconnecting Piping & Valves/Electrical items						
2	Raw Effluent Transfer Pumps (Submersible)	NEW	20 m3/hr 10m head	SS 316 Impeller	Kirloskar/ Johnson/ Grundfos	Nos.	2.00
3	Fat Removal Unit	NEW	8m length 2m width	MSEP	As per standard design.	Nos.	1.00
4	Membrane cover for Equalization tank	NEW	12.0 m x 6.0 m	MSEP	As per standard design.	Nos.	1.00
5	Equalized effluent transfer pumps to Digester	NEW	20 KLH 20M head	SS 316 Impeller	Kirloskar/ Johnson/ Grundfos	Nos.	2.00
6	Automatic Chemical dosing for pH Correction (pH Sensor- 2 no), Dual channel Analysers, controls, wiring, piping, valves etc.) As per approved drawing and design requirement.	NEW	As per site requirement & process design	MSEP	As per standard design.	Lot	1.00
9	Submersible Jet/ Eductor Mixers for Equalisation cum Hydrolysing tanks (two compartments)	NEW	12.0 m x 12.0 m x 3.5 m + FB as per site condition.	SS 304	Stallkamp/Suma/EYS	Nos.	2.00
10	Piping Frid inside ET	NEW	As per site requirement & process design	SS 304	As per standard design.	Lot	1.00
11	Recirculation Pumps	NEW		SS 316 Impeller	Kirloskar/ Johnson/ Grundfos	Nos.	4.00
12	Anaerobic digester (CSTR) - with all accessories,	NEW	CSTR (MSEP) Tank of size 13.5 m Φ x 11.0 m LD + 0.5 m FB	MSEP	As per standard design.	Lot	1.00
13	Jet/Eductor mixing: Eductor Mixing syste	NEW		SS 304	Stallkamp/Suma/EYS	Lot	1.00
14	Piping Grid	NEW			As per standard design.	Lot	1.00
15	Recirculation pumps, as per item specification and process requirement.	NEW		SS 316 Impeller	Kirloskar/ Johnson/ Grundfos	Nos.	2.00
16	Degasser tank,	NEW		MSEP	As per standard design.	Lot	1.00
17	Compressor for degasser	NEW			ELGI/IR/ATLASCOPCO	Nos.	1.00
18	Biogas Ballon on Top of CSTR	NEW	size as per dia of CSTR		Lucky tech/ GGE/ Serge Ferrari	Lot	1.00
19	Biogas Balloon Accessories	NEW			As per standard design.	Lot	1.00
20	Sludge Thickener System with flash mixer, flocculator, all accessories like chemical dosing pumps, chemical dosing tanks as per specification and process requirement.	NEW	Cap 20 KLH	MSEP	As per standard design.	Lot	1.00
21	Flash Mixer	NEW	for CFS	SS 304	SULZER (ABS)/GRUNDFOS/WILO/EBARA	Nos.	1.00
22	Flocculator with agitator	NEW	for CFS			Nos.	1.00
23	Dosing Tanks	NEW	for CFS		As per Approved make list	Nos.	1.00
24	Dosing Tanks agitator	NEW	for CFS	SS 304	As per standard design.	Nos.	1.00
25	Dosing Pump	NEW	for CFS		Verito/ approved make	Nos.	4.00
27	Flare Stack With Auto Ignition System	NEW	cap as per design		TECTIKO/ SUPER COMBUSTION	Nos.	1.00
28	Ready to install FUCHS-SBS-OxyStar Aerator for Aeration tank	NEW	Make: FUCHS-SBS-Oxystar Model: OS15.	OS15.	FUCHS-SBS-Oxystar	Nos.	2.00
30	Sludge Re-circulation pumps of secondary clarifier with Motors and accessories	NEW	5m3/hr 12m head	SS 316 Impeller	Kirloskar/ Johnson/ Grundfos	Nos.	2.00
33	Level Control Switches consisting of sensor, analyser and associated cabling (Non- contact type).	NEW			XYLEM/E & H / EMERSON/ SCIENTIFIC DEVICES/KROHNE MARSHALL	Nos.	4.00
34	Filter Feed Pumps and treated water transfer pumps	NEW	15m3/hr 30m head	SS 316 Impeller	Kirloskar/ Johnson/ Grundfos	Nos.	3.00
35	Pressure sand Filter -(10 cum/ hr) complete with all piping, valves, controls etc.	NEW	Dia 1400mm ht 1500mm	MSEP	As per Approved make list	Nos.	1.00
36	Activated carbon filter -(10 cum /hr.) complete with all piping, valves, controls etc.	NEW	Dia 1400mm ht 1500mm	MSEP	As per Approved make list	Nos.	1.00
37	Disinfection system with dosing pumps, interconnecting pipes and valves.	NEW	as per design		Verito/ approved make	Lot	1.00
39	Interconnecting Piping and Fitting	NEW	as per requirement		JINDAL/TATA	Lot	1.00
40	Interconnecting Valves	NEW	as per requirement		JINDAL/TATA	Lot	1.00
41	MCC PANEL for new units	NEW	as per requirement		Switch gears (L&T/ Schnieder/ ABB/Siemens) and others as per standard design	Lot	1.00
42	Interconnecting Cables for new units	NEW	as per requirement		GLOSTER/ CCI / KEC / FINOLEX /LAPP KABEL/ NICCO /RR KABEL /SBEE	Lot	1.00
43	Push button, cable tray,Earthing etc	NEW	as per requirement		As per Approved make list	Lot	1.00

DETAILED BOQ

S. N.	DESCRIPTION		Unit	QTY.
B.	Installation of Mechanical /Interconnecting Piping & Valves/Electrical Works			
1	Bar Screen	Existing to use	Nos.	1.00
2	Raw Effluent Transfer Pumps (Submersible)	NEW	Nos.	2.00
3	Fat Removal Unit	NEW	Nos.	1.00
4	Membrane cover for Equalization tank	NEW	Nos.	1.00
5	Equalized effluent transfer pumps to Digester	NEW	Nos.	2.00
6	Automatic Chemical dosing for pH Correction (pH Sensor- 2 no), Dual channel Analysers, controls, wiring, piping, valves etc.) As per approved drawing and design requirement.	NEW	Lot	1.00
7	Chemical solution tanks for alkali with mixture & Acid- for pH correction HDPE/FRP/LLDPE tanks – 1000 lit cap. -2 No (With One Mixture as per technical Specification.)	Existing to use		
8	Chemical Dosing pumps for Alkali and Acid for pH correction.	Existing to use		
9	Submersible Jet/ Eductor Mixers for Equalisation cum Hydrolysing tanks (two compartments)	NEW	Nos.	2.00
10	Piping Frid inside ET	NEW	Lot	1.00
11	Recirculation Pumps	NEW	Nos.	4.00
12	Anaerobic digester (CSTR) - with all accessories,	NEW	Lot	1.00
13	Jet/Eductor mixing: Eductor Mixing syste	NEW	Lot	1.00
14	Piping Grid	NEW	Lot	1.00
15	Recirculation pumps, as per item specification and process requirement.	NEW	Nos.	2.00
16	Degasser tank,	NEW	Lot	1.00
17	Compressor for degasser	NEW	Nos.	1.00
18	Biogas Ballon on Top of CSTR	NEW	Lot	1.00
19	Biogas Balloon Accessories	NEW	Lot	1.00
20	Sludge Thickener System with flash mixer, flocculator, all accessories like chemical dosing pumps, chemical dosing tanks as per specification and process requirement.	NEW	Lot	1.00
21	Flash Mixer	NEW	Nos.	1.00
22	Flocculator with agitator	NEW	Nos.	1.00
23	Dosing Tanks	NEW	Nos.	1.00
24	Dosing Tanks agitator	NEW	Nos.	1.00
25	Dosing Pump	NEW	Nos.	4.00

DETAILED BOQ

S. N.	DESCRIPTION		Unit	QTY.
26	Gas holder floating dome in MSEP with required supports, guides and counter weights etc.as per technical specification.	Existing to use	Nos.	1.00
27	Flare Stack With Auto Ignition System	NEW	Nos.	1.00
28	Ready to install FUCHS-SBS-OxyStar Aerator for Aeration tank	NEW	Nos.	2.00
29	Secondary Clarifier- Central driven of as per technical specifications.	Existing to use		
30	Sludge Re-circulation pumps of secondary clarifier with Motors and accessories	NEW	Nos.	2.00
31	V- Notch Plate in SS 304.	Existing to use		
32	Electronic Magnetic Flow Meters suitable capacity as per technical specifications.	Existing to use	Nos.	3.00
33	Level Control Switches consisting of sensor, analyser and associated cabling (Non- contact type).	NEW	Nos.	4.00
34	Filter Feed Pumps and treated water transfer pumps	NEW	Nos.	3.00
35	Pressure sand Filter -(10 cum/ hr) complete with all piping, valves, controls etc.	NEW	Nos.	1.00
36	Activated carbon filter -(10 cum /hr.) complete with all piping, valves, controls etc.	NEW	Nos.	1.00
37	Disinfection system with dosing pumps, interconnecting pipes and valves.	NEW	Lot	1.00
38	Laboratory equipment's & glass ware and chemicals for testing of BOD,COD, TSS, TDS, Oil & Grease, VFA & Alkalinity (Bidders to provide a list of all lab equipment's and glass ware considered in their scope)	Existing to use		
39	Interconnecting Piping and Fitting	NEW	Lot	1.00
40	Interconnecting Valves	NEW	Lot	1.00
41	MCC PANEL for new units	NEW	Lot	1.00
42	Interconnecting Cables for new units	NEW	Lot	1.00
43	Push button, cable tray,Earthing etc	NEW	Lot	1.00

DETAILED BOQ OF MODIFICATION

S. N.	DESCRIPTION		Unit	QTY.
C	Modification work for Old Existing System for 100 KLD			
1	Old CSTR emptying out for reworking	Modification	Lot	1.00
2	Modification work for required Eductors/piping grid etc	Modification	Lot	1.00
3	Providing Mixing system with air compressor in Degasser	Modification	Lot	1.00
4	Modification of CFS system	Modification	Lot	1.00
5	Miscellaneous piping & Valves repair/replacement etc	Modification	Lot	1.00
6	Activated carbon filter -(10 cum /hr.) complete with all piping, valves, controls etc.	Modification	Lot	1.00
7	Miscellaneous electricals like cabling/starter replacement etc	Modification	Lot	1.00
8	MS Structural Steel for Supports ETC.		MT	5.00
9	Any other item required for proper completion of ETP works in all respect. (Please attach the detailed items required with their UOM, unit price and amount.		Lot	1.00

DETAILED BOQ OF SPARES

Sl. No.	DESCRIPTION	QTY.	Unit	MOC/Make
D.	2 Years of spares for smooth operation of 1000 KLD (effluent handling capacity) etp for 3TPH potato french fries, 1100 hg/hr potato flakes line plant	1.00	Lot	As per Approved make list

DETAILED BOQ O&M ETC.

Sl. No.	DESCRIPTION	QTY.	Unit
E.	Testing, commissioning, stabilization and one month Operation, training & maintenance	1.00	Lot
F.	Statutory Approvals- CTO/CC&A (as per Government norms.)	1.00	Lot
G.	12 Months Operation & Maintenance Charges (Nos. of Technical Manpower to be indicated with their discipline)	12.00	Months

Raw Effluent Inlet Parameters				
S. No.	Parameter	Unit	Dairy/Value	
1	Flow Per Day	KL/Day	200	
2	pH	-	6	12
3	Total Suspended Solids (TSS)	mg/L	600	1000
4	Biological Oxygen Demand (BOD)	mg/L	3000	3500
5	Chemical Oxygen Demand (COD)	mg/L	3600	9280
6	Oil & Grease	mg/L	2659	7940

Note:- The inlet parameter may vary 10-20% on either side. Bidders should consider the variation in inlet effluent parameter suitably.


Treated Effluent Outlet Parameters			
S. No.	Parameter	Unit	Value
1	pH	-	6.5 – 7.5
2	Total Suspended Solids (TSS)	mg/L	<100
3	Biological Oxygen Demand (BOD)	mg/L	<30
4	Chemical Oxygen Demand (COD)	mg/L	<100
5	Oil & Grease	mg/L	< 10

Note: The treated effluent parameters shall be as per PCBA norms.

SECTION – XI

Sketches – General Site Layout



RD	13.08.25	ACHAL		SM		AG		ISSUED FOR APPROVAL		
REV.	DATE	DRAWN	SIGN.	CHECKED	SIGN.	APPROVED	SIGN.	REVISION/ZONE		
		Corporate Office: Plot no. 124-128, G.I.D.C. Estate, Vithal Udyog Nagar- 388121, Gujarat, India. Email: idmc@idmc.coop								
		SHEET TITLE:-								
SCALE		N T S		SITE PLAN OF PURABI DAIRY (20 KLPD EXPANDABLE UPTO 30 KLPH)						
JOB NO DDD-2550C01										
ISSUE FOR APPROVAL										
<p>THIS DRAWING AND ALL DESIGNS, DETAILS, INVENTIONS OR DEVELOPMENTS COVERED THEREIN ARE CONFIDENTIAL AND THE EXCLUSIVE PROPERTY OF IDMC LIMITED WHICH RESERVES ALL PATENT AND OTHER RIGHTS. IT MUST BE RETURNED WHEN REQUESTED AND USED SUBJECT TO ABOVE CONDITIONS ONLY ON AUTHORIZED COMPANY WORK. USE FIGURED DIMENSIONS, SCALING OF DRAWINGS IS AT CONTRACTOR'S OWN RISK.</p>		DRN BY	ACHAL	13.08.25	DRG. NO.	REV.				
		CHD BY	SM	13.08.25	DDD-2550C01-26	RO				
		APPROVED	AG	13.08.25	SHEET 1 OF 4			13.08.25		
		CLIENT	PURABI DAIRY							
		P.O.NO.	-							
		DESTINATION		GUWAHATI						