



**TENDER FOR
CIVIL, STRUCTURAL,
MECHANICAL & ELECTRICAL WORKS
FOR STRENGTHENING
(RENOVATION & MODERNISATION) OF
EFFLUENT TREATMENT PLANT
(UPGRADATION FROM 30KLD TO 50KLD)
AT
ROURKELA DAIRY
AT - LUAKERA, DIST – SUNDERGARH
ON TURNKEY EXECUTION BASIS**



THE ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD.

**D-2, SAHID NAGAR
BHUBANESWAR -751007**

June -2023

Cost : Rs.10,000/- +18% GST

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www.omfed.com

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Ph No- (0674) 2546030/2540273/2540417,
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TENDER NOTICE

OMFED invites sealed techno-commercial Bids (Two Bid System) / offer in separate envelopes from Manufacturers/Integrators/Contractors having adequate experience in establishment of Effluent Treatment Plant for “**Civil, Structural, Mechanical & Electrical works for strengthening (renovation & modernisation) of Effluent Treatment Plant (upgradation from 30KLD to 50KLD) at Rourkela dairy, at - Luakera, dist – Sundergarh on turnkey execution basis**”.

The tender notice, tender documents, containing the terms and conditions can be downloaded from the website <http://www.omfed.com> from **dt.19.06.2023 to dt.10.07.2023**. Sealed tender with **EMD of Rs.1,50,000/-** and **paper cost of Rs.10,000/- plus 18% GST (Rs.11,800/-)** in shape of demand draft drawn on any nationalized bank in favor of OMFED payable at Bhubaneswar shall be received up to 14:00 hrs on **dt.10.07.2023** and the technical bid shall be opened on the same day at 15:00 hrs in presence of the interested bidders at the above address.

Further details can be seen in the OMFED website www.omfed.com. The corrigendum / amendment, if any, to this notice shall be published only in the OMFED website www.OMFED.com and will not be published again in the newspapers.

The management reserves the right to cancel any or all bids without assigning any reason thereof.

Managing Director
OMFED

SECTION- I

INVITATION TO BID

NAME OF WORK: Civil, Structural, Mechanical & Electrical works for strengthening (renovation & modernisation) of Effluent Treatment Plant (upgradation from 30KLD to 50KLD) at Rourkela dairy, at - Luakera, dist – Sundergarh on turnkey execution basis.

SCOPE OF WORK:

- Strengthening (Renovation and modernisation) of existing 30KLD ETP including design, construction, fabrication, supply, erection, testing, commissioning and trial run with latest Technology at Rourkela dairy, Luakera, Dist. Sundergarh on Turnkey execution basis.
- one-year operation & maintenance of the plant after expiry of warranty period
- To provide training to operate ETP to the Dairy personnel
- To get requisite approval required from OSPCB. *However, fee for the same shall be reimbursed against submission of receipt*

3.0 **REQUEST FOR BIDDING DOCUMENT:** A complete set of bidding documents may be purchased by any interested eligible bidder on the submission of a written application to THE ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD., BHUBANESWAR and upon the payment of **Rs.11,800/- (Rs.10,000/- plus 18% GST)**.

4.0 **BID DETAILS:** Detailed terms and conditions as well as the technical specifications for all the items of works as indicated in the invitation to bid are contained in the bidding documents. Only one set of document shall be sold to one bidder.

- | | | |
|-----|-----------------------------------------------------|-------------------------|
| (a) | Bid reference | : PROJ/158/RKVY/REN/22 |
| (b) | Price of bid document | : Rs.11,800/- |
| (c) | Date of commencement of downloading of bid document | : 19.06.2023 |
| (d) | Last date for the downloading of bidding document | : 10.07.2023 |
| (e) | Last Date and time for receipt of bids | : 10.07.2023, 14.00 Hrs |
| (f) | Time and date of opening of bids | : 10.07.2023, 15:00 Hrs |

- (g) **Place of opening of Technical bids** : Corporate Office OMFED
- (h) **Address for communication** : OMFED, D-2, Sahid Nagar,
Bhubaneswar
- (i) **Earnest Money Deposit** : **Rs.1,50,000/-**
- (j) **Time of completion (Months)** : 6 months (Six Months)

- 5.0 **PURCHASE OF BIDDING DOCUMENT:** Bidders who desire to obtain bidding document in person by paying cash or demand draft may do so on any working day from 11.00 hrs. to 15.00 hrs. only during the period of sale of bid documents as specified in clause 4 hereof. Demand draft from Nationalised Banks to be prepared in favour of **OMFED**, payable at **Bhubaneswar**.
- 6.0 **DOCUMENT BY POST:** For purchase of bidding document by post, demand draft in favour of **OMFED, Bhubaneswar** of value equal to price of bidding document plus incidental charges, as specified in clause 4 (b) and 4 (c) hereof may be sent to the address of communication during the period of sale of bid document. ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LIMITED, shall not take the responsibility for any delay in receipt of the bidding document if it is sent by post.
- 7.0 **BID SECURITY:** All bids must be accompanied by a bid security in the acceptable form as specified in the bidding document and must be delivered to the address of communication as stated above on or before the last date and time of receipt of bids as given in clause 4.0 (f) above.
- 8.0 **Unsuccessful Bidder's** EMD shall be returned by OMFED, as per the norms to the Bidders, as soon as possible, after the tender is decided. No interest shall be paid on EMD deposits.
- 9.0 **EMD may be forfeited** if successful Bidder fails / denies to perform work OR If any Bidder withdraws its bid during the bid validity period.
- 10.0 **PRE-BID MEETING:** There will be a pre-bid meeting convened at the office of THE ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD., BHUBANESWAR, at the address of communication on **dt.27.06.2023 at 15:00 Hrs.**
- 11.0 **THE TECHNICAL BID** Physical will be comprised of all supporting documents and should be submitted personally or sent by Registered post, so as to reach the office of the Managing Director, OMFED, OMFED, D-2, Sahid Nagar, Bhubaneswar not later than 10.07.2023 up to

2:00 p.m. OMFED will not be responsible for any postal delay. Envelope to be superscribed with "TECHNICAL BID - Physical" for ETP tender - OMFED Rourkela Plant, Luakera.

SECTION – II A - INSTRUCTIONS TO BIDDERS

GENERAL

1.0 General Information:

1(a) Description of Work: **Civil, Structural, Mechanical & Electrical works for strengthening (renovation & modernisation) of Effluent Treatment Plant (upgradation from 30KLD to 50KLD) at Rourkela dairy, at - Luakera, dist – Sundergarh on turnkey execution basis.**

(b) Owner :Managing Director, Odisha State Cooperative Milk Producers' Federation Ltd (OMFED) having its office at D-2 Shaheed Nagar, Bhubaneswar-751007.

1.2 Location and Area:

(a) Project site : Luakera, Rourkela, Odisha

(b) Nearest Railway Station : Rourkela

(c) Nearest Airport :Bhubaneswar

(d) Nearest Major Town :Rourkela, Odisha

(e) Access Roads : NH-143

1.3 Period of Completion:

The Period of completion shall be 6 Months from the date issuance work order which shall include the non-working periods during monsoon and festivals.

2.0 Sources of Funds: RKVY, Govt. of India

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 recognised 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 OMFED, 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 or if a Joint venture of each party thereto constituting the bidder.
 - (B) Power of Attorney or a true copy thereof duly attested in case an authorised representative has signed the bid.
 - (C) Details of the experience and past performance of the bidder (or of each party to a joint venture) on works of similar nature **within the past Five years**, and details of current work in hand and other Contractual commitments shall be submitted by the bidder.
 - (D) Major items of constructional plant proposed for use in carrying out the Contract and the qualifications and experience of key personnel proposed for the administration and the execution of the Contract, both on and off site.
 - (E) 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.
 - (F) Reports on the financial standing of the bidder (or of any party to a joint venture) such as profit and loss statements, balance sheets and auditor's reports for the past three years, an estimate of the financial projection for the next two years and an authority from the bidder (or an authorised representative of a joint venture) to seek reference from the bidder's bankers; and

(G) Statement of arbitration/ disputes in which the bidder is involved.

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 at least for five financial years at time of 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 (19-20, 20-21 & 21-22) ending 31st March should not be less than 60 % of the estimated cost (i.e. Rs.70.00lakhs).

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/Commissioned contracts of similar nature ETP 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 the estimated cost.

OR

II. Two contracts/ works of similar nature each costing not less than 50 % of the estimated cost.

OR

III. Three contracts/works of similar nature each costing not less than 40 % of the estimated cost.

Similar nature of works means establishment of an Effluent treatment plant with similar biological treatment systems having Anaerobic treatment — (UASB Digester) for any Dairy / Food / Distillery / Pharma/ Edible Oil & Fat Industry of Minimum 30 KLD capacity with latest technology.

Note:

- i) Contract means the work done against one work order on single location.
- ii) Cost of contract/ works, excluding the cost/ recovery of materials supplied by the purchaser shall be considered for evaluation.

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 concerned with regard to qualification criteria, after submission of the tender, only related shortfall documents shall be asked for and 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 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 26AS for the last three 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 work completion period and estimated cost indicated in IFB.

Assessed Available bid capacity = (A*N*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 Work Completion time as specified in Invitation for Bid.

B= Value of on-going works to be completed during the Completion period.

3.7 Joint ventures are permitted to participate in Tenders.

Bid submitted by a joint venture of two or more firms, as partners shall comply with the following requirements:

- (a) The bid, and in case of successful bid, the form of agreement shall be signed by all parties so as to be legally binding on the partners
- (b) One of the partners shall be nominated, as being in-charge and this authorization shall be evidenced by submitting power of attorney signed by legally authorized signatories of all the partners
- (c) The partner in-charge shall be authorized to incur liabilities and receive instructions for and on behalf of any and all the partners of the joint venture and the entire execution of the contract including payment shall be done exclusively with the partner in-charge
- (d) All the partners of the joint venture shall be liable jointly and severally for the execution of the Contract in accordance with the contract terms and a relevant statement to this effect shall be included in the authorization mentioned under (b) above as well as in the form of bid and the form of agreement (in case of the successful bid) and
- (e) A copy of the agreement entered into by the joint venture partners shall be submitted with the bid
- (f) Experience, resources, men and machinery of each party to the joint venture will be taken into account only to the extent of their participation for performing task under the joint venture agreement

4.0 Cost of Bidding:

The bidder shall bear all costs associated with the preparation and submission of his bid and the OMFED 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 OMFED 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 ETP contracts, if executed at site under the circumstances of an operating plant which can not 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:

| Section | Description |
|---------------|----------------------------------------------------------|
| SECTION – IIA | INVITATION TO BID & INSTRUCTIONS TO BIDDERS |
| SECTION – IIB | GENERAL CONDITIONS OF THE CONTRACT |
| SECTION – IIC | PAYMENT TERMS |
| SECTION – III | SPECIAL CONDITIONS OF THE CONTRACT |
| SECTION – V | GENERAL TECHNICAL SPECIFICATIONS & DESIGN DATA TABLES |
| SECTION – V | PRICE BID FORMAT :SCHEDULE I |
| SECTION – IV | FORM OF BID & DEVIATION FORMS: SCHEDULE II |
| SECTION – IV | FORM OF AGREEMENT: SCHEDULE III |

- 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.
- 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 OMFED in writing at the address of communication indicated in the Invitation for bid. The OMFED will respond in writing to any request for the clarification which is required earlier than 10 days prior to the dead line for the submission of the bids. Written copies of the Purchaser's response (including an explanation of the query but without identifying the source of inquiry) will be sent to the respective Bidder and necessary corrigendum (if required) will be uploaded in the OMFED's website and e-tender portal.

8.0 Amendment of Bidding Documents:

- 8.1 At any time prior to the deadline for the submission of bids, the OMFED 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 uploaded in the OMFED's website only.
- 8.3 In order to afford prospective bidders reasonable time in which to take an amendment into account in preparing their bids, the OMFED 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 OMFED 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 thereto duly filled;
- (b) The Earnest Money Deposit;
- (c) The Schedule of Quantities duly filled;
- (d) The Schedule of supplementary information, the information on eligibility and qualifications;
- (e) The complete bidding document has to be returned along with bid as stated above.

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 Earnest Money Deposit)

Additional special instructions:

Before uploading of their bid, the bidder should check the OMFED' 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 OMFED 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 OMFED 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 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 OMFED 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. A bid submitted with any price adjustment condition 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 Bid.

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 OMFED 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 Earnest Money Deposit. A bidder agreeing to the request shall not be permitted to modify his bid, but shall be required to extend the validity of his Earnest Money Deposit correspondingly. The provisions of clause 14 shall continue to apply during the extended period of bid validity.

14.0 Earnest Money Deposit (EMD):

14.1 The bidder shall furnish, as part of the bid, an Earnest Money Deposit of the amount as specified in the Invitation for bid.

The Earnest Money Deposit shall be denominated in Indian Rupees only, and shall be in the form of a Demand Draft issued by a Nationalized Bank/ Schedule Bank, drawn in favour OMFED, payable at Bhubaneswar.

Any bid not accompanied by an acceptable Earnest Money Deposit pursuant to clause 14.1 and 14.2 hereof shall be rejected by OMFED as non-responsive.

The bid securities 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 The Earnest Money Deposit 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 OMFED on the Earnest Money Deposit furnished by the bidder.

14.7 The Earnest Money Deposit 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

14.8 Valid MSME certificate shall be accepted towards exemption of EMD.

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 Format and Signing of Bids:

- 16.1 The bidder shall prepare and upload the copy of the documents comprising the bidding documents downloaded by him.
- 16.2 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.
- 16.3 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.
- 16.4 The bidder shall quote the rate of each item.

D. SUBMISSION OF BIDS

19.0 Deadline for Submission of Bids:

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

19.2 The OMFED 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 OMFED 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 pursuant to clause 14.

E. BID OPENING AND EVALUATION

22.0 Bid Opening

The OMFED 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 OMFED. Such bidders will be intimated date of opening of Part II- Commercial Bid separately.

The OMFED will examine the bids to determine whether they are complete, whether the requisite Earnest Money Deposit 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 OMFED 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 bidder's bid.

24.0 Clarification of Bids:

- 24.1 To assist in the examination, evaluation and comparison of bids, the OMFED 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 OMFED during the evaluation of the bids in accordance with clause 26.

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 concerned with regard to qualification criteria, after submission of the tender, only related shortfall documents shall be asked for and 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.

25.0 Determination of Responsiveness

- 25.1 Prior to the detailed evaluation of the bids the OMFED 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 OMFED'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 OMFED 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 OMFED 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 OMFED 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 OMFED 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 OMFED 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

28.4 Additional Performance Security: Not Applicable

F. AWARD OF CONTRACT

29.0 Award Criteria:

- 29.1 Subject to clause 30, the OMFED shall award the Contract to the bidder whose bid has been determined to be substantially responsive to the bidding documents, technically acceptable and who has offered the lowest Evaluated bid price pursuant to clause 28, and provided further that the bidder has the capability and the resources to carry out the Contract effectively and has adequate technical and financial competence including record of satisfactory performance.

30.0 OMFED'S Right to Accept any Bid and to Reject any or all bids.

- 30.1 Notwithstanding clause 29 or any other clauses stated above, the OMFED reserves the right to accept or reject any bid and to annul the bidding process and reject all 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 OMFED's action.

31.0 Notification of Award

- 31.1 Prior to the expiry of the period of bid validity prescribed in the bid documents, the OMFED will notify the successful bidder in writing that his bid has been accepted. This letter (hereinafter and in the Conditions of Contract referred to as "Letter of Acceptance") shall name the sum which the OMFED will pay to the Contractor in consideration of the execution, completion and the maintenance of the works by the Contractor as prescribed by the Contract (hereinafter and in the Conditions of the Contract referred to as the "Contract price")
- 31.2 The notification of the award will constitute the formation of the Contract.
- 31.3 Upon the furnishing by the successful bidder of a performance security in accordance with the clause 33 the OMFED may notify the unsuccessful bidders that their bids have been unsuccessful.

32.0 Signing of Agreement:

- 32.1 At the same time that the OMFED notifies the successful bidder that his bid has been accepted, the OMFED 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 OMFED.

33.0 Performance Security:

33.1 Within 30 days of the receipt of the notification of award from the OMFED, the successful bidder shall furnish to the OMFED 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 clause 32 or 33 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Earnest Money Deposit.

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.

35.0 PENALTY ON LATE COMPLETION /LIQUIDATED DAMAGES:

The time period to complete the work should be strictly adhered. In case they are not followed or in case of delay in execution or non-execution of the order, the OMFED reserves the right either to cancel the order and make alternative arrangement from other sources at the risk and cost and expenses of the contractor. In case the contractor delays in completion of the work as per schedules, the following liquidated damages will be charged as per OMFED directives:

| Sl. No. | DURATION OF DELAY | LIQUIDATED DAMAGE |
|---------|-------------------|-------------------------|
| 1 | 1 Month | 1% of work order value |
| 2 | 1 to 3 Months | 3% of work order value |
| 3 | Beyond 3 Months | 10% of work order value |

36.0 CO-ORDINATION OF THE PROJECT: The contractor shall co-ordinate and cooperate with OMFED Officers/ Engineers and/or Consultant at site for execution of project to monitor quality of work & fulfil the design criteria & specification of ETP provided in bid.

37.0 PROTECTION OF EQUIPMENTS: The contractor shall effectively protect supplied equipment's/ material at his own expense, such work, equipment or material as may be liable to damage, theft or tampering

during erection. Insurance charges etc. for the above shall be borne by the contractor till handing over of complete installation of ETP to OMFED as per terms and conditions of contract.

38.0 GUARANTEE / DEFECT LIABILITY PERIOD: The defect liability period shall be 12 months from the date of the successful commissioning of all the components of the ETP and handing over to OMFED.

39.0 Successful commissioning date of ETP will comprise of not only the satisfactorily completion & working of all components of ETP but also includes the first treated Effluent sample report from NABL accredited Laboratory as per the OSPCB standards.

40.0 Any defect / defects found during the defect liability period shall be rectified / replaced by the contractor within time period specified as may be necessary for the proper running of plant at his own cost on providing intimation by the OMFED.

41.0 On non-compliance of clause 40.0 as mentioned above the OMFED will do the rectification/replacement needed to run the plant departmentally / through engaging some other agency / agencies and the cost of it will be recovered from the security deposit or by encashment of amount from the Bank Guarantee furnished by the contractor.

SECTION II B

GENERAL CONDITION OF CONTRACT

DEFINITIONS & INTERPRETATIONS

- 1.0** In the Contract, as hereinafter defined, the following words and expressions shall have the meaning hereby assigned to them except where the context otherwise requires:
- 1.1** **OWNER** shall mean the client/Purchaser on whose behalf the enquiry is issued by THE ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD., BHUBANESWAR and shall include his successors and assignees, as well as his authorized representatives.
- 1.2** **PURCHASER** shall mean the organization who is purchasing the goods and services.
- 1.3** **CONSULTANT** shall mean THE ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD., BHUBANESWAR or the consultants appointed by THE ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD., BHUBANESWAR the Owner of the Project.
- 1.4** **OMFED** shall mean THE ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD., BHUBANESWAR.
- 1.5** **ENGINEER** shall mean the Engineers or any other authorized representative of the OMFED/Purchaser.
- 1.6** **Architect** shall mean the architect appointed by the OMFED.
- 1.7** **Structural Consultants** shall mean the Structural Consultants appointed by the OMFED.
- 1.8** **Bidder** shall mean the firm/party/individual who submits the bid against the Invitation to Bid.
- 1.9** **Contractor** shall mean the successful bidder whose Bid has been accepted by the OMFED and on whom a work order has been placed and shall include his heirs, legal representatives and assignees.

- 1.10 **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 OMFED and shall include his heirs, successors, legal representative, and assignees.
- 1.11 **Contract price/rate** shall mean the prices/rates of the accepted Bid.
- 1.12 **Contract** shall mean the articles of agreement, the conditions, the appendix, the schedule of quantities, and/or specifications attached herewith.
- 1.13 **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 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.
- 1.14 **Site** shall mean the actual place of the proposed project at Rourkela Dairy or any other place where work is to be executed under the Contract. It shall also include any other land allotted by the Owner 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 a midnight to midnight.
- 1.18 **Plant** shall mean the proposed Effluent Treatment Plant (ETP), its units, equipment, civil works, electrical works, and piping within the battery limit of the ETP under the contract.
- 1.19 **Award** shall mean the written acceptance of bid by the OMFED given to the successful bidder.
- 1.20 **Performance Security** shall mean the amount pledged with the OMFED while signing the agreement for faithful and satisfactory performance of the Contract.
- 1.21 **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.
- 1.22 **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 OMFED.

- 1.23 **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 OMFED/Engineers/Owner.
- 1.24 **Temporary Works** shall mean temporary works of every kind required in or about the execution or maintenance of works.
- 1.25 **Permanent works** shall mean the permanent works to be executed and maintained in accordance with the Contract.
- 1.26 **Works** shall include both temporary works and permanent works with respect to the effluent treatment plant at Rourkela Dairy.
- 1.27 **E.T.P.** shall mean Effluent Treatment Plant covered under this tender document.
- 1.28 **Approved/Approval** shall mean approval in writing including subsequent written confirmation or previous verbal or written approval.
- 1.29 **I.S.S.** shall mean Indian Standard Specifications of Bureau of Indian standards.
- 1.30 **Government** shall mean the Government of India or any other State Government.
- 1.31 **Tender** shall mean the present Bid.
- 1.32 **Headings and Marginal notes:**

All headings of clauses/sub clauses/ notes of these Conditions of Contract or to the Specifications or any other part of 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 the or be used in the interpretation or construction 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.

GENERAL

2.0 DUTIES AND POWER OF THE ENGINEER

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 after due approval from OMFED:

- (a) Approval of subletting of any part of the works pursuant to clause 3.0 hereof:
- (b) Certification of additional sums under sub-clause 24.2 hereof:
- (c) Determination of an extension of time pursuant to clause 89.0 hereof:
- (d) Issuance of a variation order pursuant to clause 23.0 hereof:
- (e) Fixing rates or prices for the additional works executed under the Contract pursuant to clause 23.0 hereof.

CONTRACT DOCUMENT

3.0 LANGUAGE AND LAW OF CONTRACT

- 3.1
- 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 in India where the Contract shall be per formed.

3.2 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.

- 3.3 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.

4.0 DRAWINGS: THEIR PURPOSE AND THE CUSTODY

- 4.1 The contract drawings if issued shall be 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 material to be used.
- 4.2 In case any feature of the work is not set forth in the drawings and specifications, the Contractor shall forthwith apply / report to the Engineer for further instructions, drawings or specifications.
- 4.3 The drawing 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. On the completion of the Contract the Contractor shall return to the Engineer all drawings issued under the Contract.
- 4.4 The Contractor shall give written notice to the Engineer whenever planning or progress of the works is likely to be delayed unless any further drawings or instruction is issued by the OMFED/Engineers/Owner within a reasonable time. The notice shall include the detail of the drawings of 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.
- 4.5 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 of 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.

5.0 FURTHER DRAWINGS AND INSTRUCTIONS

- 5.1 The Engineer may also authorize his representative to perform his duties and functions. The Contractor shall carry out and be bound by the same. The Engineers 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

6.0 CONTRACTOR'S GENERAL RESPONSIBILITIES

- 6.1 The Contractor shall, subject to the provisions of the Contract, and with due care and diligence, execute and maintain, and provide all labour including the supervision thereof, material, 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.
- 6.2 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 any Temporary Works/Permanent Works prepared by the Engineer.

7.0 CONTRACT AGREEMENT

- 7.1 The contractor shall be called upon so to enter into and execute Contract Agreement, in the form annexed with such modifications as may be necessary.

8.0 PERFORMANCE SECURITY

- 8.1 Within 30 days of the receipt of the notification of the Award of the Contract from the OMFED/Owner the successful bidder shall furnish to the OMFED/Purchaser/Owner a performance security for an amount of 10% of the Contract value, valid till the end of the warranty period.
- 8.2 The proceeds of the performance security shall be payable to the OMFED/Owner as compensation for any loss resulting from the Contractor's failure to complete his obligations under the Contract.
- 8.3 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 ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD., BHUBANESWAR, payable at Bhubaneswar.
 - b) A Bank guarantee issued by a **Nationalized Indian Bank**. The acceptable form shall be strictly as provided in Section IX of the Bidding documents.
- 8.4 The bank guarantee (B.G.) shall be valid for the entire period of Contract including the Period of Maintenance. The B.G. can be initially accepted for a period of

maximum 18(eighteen) months rather than completion period plus 12(twelve) months period of maintenance on written request of contractor/ bidder that this shall be extended as per terms of the contract. The validity of the bank guarantee is suitably extended in the event of extension of time of the Contract pursuant to clause no. 89 herein.

- 8.5 The performance security shall be released by the OMFED not later than 60 days following the date of delivery of the Maintenance certificate by the Engineer.
- 8.6 In the event of increase in the Contract value, in actual execution, proportionate additional performance security shall be paid by the Contractor or recovered from the subsequent payments due to the contractor.
- 8.7 In the event of decrease in the Contract value the performance security shall be proportionately adjusted on the completion of the work.
- 8.8 No interest shall be paid by OMFED for the amount deposited as Performance security with the OMFED.**

9.0 SUFFICIENCY OF TENDER

- 9.1 The contractor shall be deemed to have got himself satisfied before tendering as to 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 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, completion and maintenance of works.

10.0 CONTRACTOR'S SUPERINTENDENCE

- 10.1 The contractor shall give or provide all necessary superintendence during the execution of the work and as long thereafter as the Engineer may consider necessary for the proper fulfillment 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, direction and instructions from the Engineer.

11.0 CONTRACTOR'S EMPLOYEES

- 11.1 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 proper and timely execution and maintenance of the Works.
- 11.2 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, misconducts 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.

12.0 PATENT RIGHT AND ROYALTIES

- 12.1 The Contractor shall save harmless and indemnify the OMFED/Owner from and against all claims and proceedings for or on account of infringement of any patent rights, design trademark of name or other protected rights in respect of any Constructional Plant, machine work, or material and 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 material required for the works or any of them.

LABOUR

13.0 ENGAGEMENT OF LABOUR

- 13.1 The Contractor shall make his own arrangements for the engagement 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 will employ staff and labour with required qualifications and experiences from sources within India.
- 13.2 The Owner/OMFED may at their own discretion and convenience make available at the site, land for Contractor's labour hutments, field office, godowns, workshop and assembly yard required for the execution for the Contract. The Contractor shall at his own cost construct all these temporary buildings and provide suitable water supply and sanitary arrangement as approved by the Engineer.

- 13.3 The personnel so engaged by the Contractor shall be the employees of the Contractor and there shall exist no privities of Contract between the personnel so engaged and the OMFED/Owner.
- 13.4 On completion of the works undertaken by the Contractor, he shall remove all temporary buildings / structures erected by him and have the site cleared up and remove the debris 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 an 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 pendency of the Contract to vacate the land by giving 7 days' notice without giving any reason.
- 13.5 Land for residential accommodation for staff and labour may be made available at the discretion of the OMFED/Engineer/owner subject to availability.
- 13.6 The Contractor shall, so far as is reasonably practicable, having regard to local conditions, provide on the Site, to the satisfaction of the Engineers an adequate supply of drinking and other water for the use of the Contractor's staff and work people.
- 13.7 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.
- 13.8 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.
- 13.9 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.
- 13.10 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.
- 13.11 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 Act (R&A), 1970, Minimum wages Act, Provident Fund Act & Rules, for the payment of wages in respect of the persons engaged by him.
- 13.12 The Contractor shall be responsible for observance by his sub-contractor of the foregoing provisions.

13.13 Statutory Provisions of ESI & EPF for resource engaged:

The vendor must abide by all applicable rules, laws regulations that may be in force from time to time and shall be responsible for conduct of resource persons as an immediate Employer. Further, the vendor shall ensure compliance of all permissions under Act & Regulations of ESI & EPF Scheme. Vender should submit the relevant records & registers towards contribution made for ESI & EPF in respect of the resource persons engaged as & when required by the concerned Statutory Authorities. If the vendor defaults in any manner to comply with the provisions of ESI & EPF Act & Scheme made there under including all other applicable Laws & Regulations, the vendor shall be solely responsible for the same and shall be liable to pay any fine/penalty/damage/interest imposed by the authorities. In case of default by the vendor the notional amount towards fine/penalty/damage/interest likely to be imposed by the concerned Statutory Authorities shall be deducted from the running Bill/Security Deposit/Performance Guarantee and kept separately till finalization of the matter. No interest shall be paid on such amount. Besides the above, the vendor requires to complying with any other Act/Provisions such as payment of Bonus etc., if applicable for the resource persons engaged.

14.0 RETURNS OF LABOUR, ETC.

- 14.1 The contractor shall submit to the OMFED/Owner copies of the license under the Contract Labour Act, if required and obtained by the Contractor and his Provident Fund no. 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 in respect of the Constructional Plant as the Engineers may require.
- 14.2 The contractor shall not employ in connection with the works any person who has not completed fifteen years of age.
- 14.3 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 (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 OMFED/Owner in respect of all claims that may be made against the OMFED/Owner for noncompliance thereof by the Contractor.
- 14.4 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.
- 14.5 In the event of the Contractor committing a default or breach of any 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 OMFED/Owner from all such penalties and compensations.

MATERIALS AND WORKMANSHIP

15.0 MATERIALS AND WORKMANSHIP

- 15.1 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 place as may be specified in the Contract or at all or any of such places. The Contractor shall provide such assistance, instrument, 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.
- 15.2 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.
- 15.3 The cost of conducting any test ordered by the Engineer to ascertain the quality of the material and the workmanship shall be borne by the Contractor.

16.0 INSPECTION OF OPERATIONS

- 16.1 The engineer and any person authorized 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 work and the Contractor shall afford every facility for and every assistance in or in obtaining the right to such access.

COMMENCEMENT TIME AND DELAYS

17.0 COMMENCEMENT OF WORKS

- 17.1 The Contractor shall commence the works on Site within the period named in the Appendix to the Tender 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.

18.0 POSSESSION OF SITE

- 18.1 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 OMFED/Owner 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 work in accordance with the programme referred to in Clause 46 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 programme of proposals, as the case may be. If the Contractor suffers delay from the failure on the part of the OMFED/Owner to give possession in accordance with the terms of this Clause, the Engineers shall grant an extension of time for the completion of the works as, in his opinion shall be fair and the price escalation pursuant to clause 100.0 hereof provided the extended time period including the original Contract period exceeds 12 months.

18.2 The Contractor shall bear all costs and charges for special or temporary way 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 purpose of the works.

19.0 NO NIGHT WORK

- 19.1 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.

20.0 RATE OF PROGRESS

- 20.1 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 as 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's permission to do any work at night, such permission shall not be unreasonably refused.

21.0 CERTIFICATION OF COMPLETION OF WORKS

- 21.1 When the whole of the Works have been virtually completed and have satisfactorily passed any final test as 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 OMFED/Owner, 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, required 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.

21.2 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:

- 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 OMFED/Owner.

21.3 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.

21.4 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.

22.0 CONTRACTOR TO SEARCH

22.1 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 OMFED/Owner. 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 66 hereof.

ALTERATIONS, ADDITIONS AND OMISSIONS

23.0 VARIATIONS

23.1 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 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 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 work,
- f) Change any specified sequence, method or timing of contract or any part the works, and 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.

23.2 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 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 confirmations 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.

24.0 VALUATION OF VARIATIONS

- 24.1 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 and in the event of non-agreement, the Engineer shall fix such rates or prices as shall, in his opinion, be reasonable and proper.
- 24.2 Provided that if the nature or amount of any omission or addition relative to the nature or amount of the whole of 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.
- 24.3 In case of any class of work for which there is no such specification supplied by the Owner/OMFED 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 24.1 or variation of rate or price under clause 24.2 hereof 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.

24.4 If, on certified completion of the whole of the works it shall be found that reduction or increase is greater than 25 percent of the sum named in the Letter or 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, excluding the adjustment of price made under Clause 100.0 hereof 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 factor, including the Contractor's site and general overhead costs of the Contract.

24.5 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 expense will be considered which has not been included in such particulars provided always that the Engineer shall be entitled to authorize 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

25.0 PLANT, ETC., EXCLUSIVE USE FOR THE WORKS

25.1 All Constructional Plant, Temporary Works and materials provided by the Contractor shall, when brought on to the Site, be deemed to be exclusively intended for the execution 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.

25.2 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.

25.3 The OMFED/Owner shall not at any time be liable for the loss of or damage to any of the said Constructional Plant. Temporary Works or material save as mentioned in Clause 50 and 92 hereof.

26.0 APPROVAL OF MATERIALS, ETC., NOT IMPLIED

26.1 The operation of Clause 25 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.

27.0 PROGRESS

27.1 The progress of work shall be monitored in accordance with the approved work programme. The work programme drawn out soon after the award of the Contract shall be reviewed every month and bottlenecks, if any, identified and remedial action planned and the Engineer informed accordingly.

28.0 ASSESSMENT OF WORK

28.1 The Engineer shall except as otherwise stated, ascertain and determine the quantum of work done in accordance with the approved construction drawings when he requires any part or parts to be assessed, give notice to the Contractor's authorized agent or representative who shall forthwith attend or send a qualified agent to assist the Engineer in making such assessment and shall furnish all particulars required by them. Should the Contractor not attend, or neglect or omit to send such agent, then the assessment made by the Engineer or approved by him shall be taken to be the correct assessment of work. For the purpose of quantifying such permanent work as is to be assessed by records and drawings, the Engineer shall prepare records and drawings 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 drawing with the Engineer and shall sign the same when so agreed. If the Contractor does not so attend to examine and agree to such records and drawings, they shall be taken to be correct. If, after examination of such records and drawings, the Contractor does not agree to 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 respect in which such records and drawings are claimed by him to be incorrect.

29.0 MODE OF ASSESSMENT

29.1 The works shall be assessed unit-wise, 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 relevant IS codes shall be applicable and binding to the Contract. Only the latest editions of all the codes of practices including all latest official amendments and revisions shall be applicable.

NOMINATED SUB-CONTRACTORS

30.0 DEFINITIONS OF "NOMINATED SUB-CONTRACTOR"

- 30.1 All specialists, merchants, tradesmen and others executing any work or supply of goods, materials or services, who may have been or been nominated or selected or approved by the OMFED/Owner 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-Contractor employed by the Contractor and are referred to in this Contract as "nominated Sub-Contractors".
- 30.2 The contractor shall not be required by the OMFED/Owner 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 OMFED/Owner 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 in connection with any failure to perform such obligations or to fulfill 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 purpose of the Contract and from all claims as aforesaid.
- 30.3 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 fulfill such liabilities.
- 30.4 For all works executed or goods, materials, or services supplied by any nominated Sub-Contractor, they 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 24 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.

30.5 Before issuing, under Clause 91 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 retentions, 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 OMFED/Owner shall be entitled to pay to such nominated sub- contractor directly, upon the certificate of the Engineer, all payments, less retentions, 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 OMFED/Owner from any sums due or which may become due to the Contractor.

Provided always that, where the Engineer has certified and the OMFED/Owner 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.

30.6 In the event of a nominated sub-contractor, as herein before 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 Contractor, the Contractor shall at any time, after the expiry of the Period of Maintenance, assign to the OMFED/Owner, at its request and cost the benefit of such obligation for the unexpired duration thereof.

31.0 APPROVAL ONLY BY MAINTENANCE CERTIFICATE

31.1 No certificate other than the Maintenance Certificate referred to in Clause 32 hereof shall be deemed to constitute approval of the works.

32.0 MAINTENANCE CERTIFICATE

32.1 The Contract shall not be considered as completed until a Maintenance Certificate shall have been signed by the Engineer and delivered to the OMFED/Owner 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 section or parts of the works, the expiry of the latest such period, of as soon

thereafter as any works ordered during such period, pursuant to Clause 66 and 22 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 OMFED/Owner.

- 32.2 The OMFED/Owner shall not be liable to the Contractor for any matter or thing arising out of in connection with the Contract or 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.
- 32.3 Notwithstanding the issue of the Maintenance Certificate the Contractor and, subject to clause 32.2 the OMFED/Owner shall remain liable for the fulfillment 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 purpose of determining the nature and extent of any of such obligation, the Contract shall be deemed to remain in force between the parties here to.

REMEDIES AND POWERS

33.0 DEFAULT OF CONTRACTOR

- 33.1 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 OMFED/Owner 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 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 instruction to the contrary, sub-let any part of the Contract then the OMFED/Owner may, after giving 15 days notice in writing to the Contractor, enter upon the site and the works and expel the Contractor therefrom 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 OMFED/Owner or the Engineer by the Contract, and may himself complete the works or may employ any other Contractor to complete the works. The OMFED/Owner 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 OMFED/Owner 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.

- 33.2 The Engineer shall, as soon as may be practicable after any such entry and expulsion by the OMFED/Owner, 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 then 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.
- 33.3 If the OMFED/Owner 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 OMFED/Owner 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 OMFED/Owner the amount of such excess and it shall be deemed a debt due by the Contractor to the OMFED/Owner and shall be recoverable accordingly.
- 33.4 In such event, the OMFED/Owner shall charge 15% overhead to cover the departmental charges and the same shall be recovered from the Contractor.
- 33.5 No credit shall be allowed to the Contractor in case the amount spent by the OMFED/Owner for a particular item, which shall be less than the amount payable as per the tender amount.

34.0 URGENT REPAIRS

- 34.1 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 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 OMFED/Owner 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 OMFED/Owner 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 OMFED/Owner in so doing shall be recoverable from the Contractor by the OMFED/Owner 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

35.0 NO LIABILITY FOR WAR ETC. SUBJECT TO COVERAGE OF INSURANCE.

35.1 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 64 hereof prior to the occurrence of any special risk hereinafter mentioned, or to property whether of the OMFED/Owner 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 OMFED/Owner 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.

35.2 If the works or any material on the site, or any other property of the Contractor used or intended to be used for the purpose of the works, shall sustain destruction or damage by reason of any 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 purpose of works.

35.3 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.

35.4 The OMFED/Owner 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 64 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, subjected 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.

35.5 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 50 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.

- 35.6 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 best endeavors to complete the execution of the works. Provided always that the OMFED/Owner 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 35.8 hereof, terminate, but without prejudice to the right of either party in respect of any antecedent breach thereof.
- 35.7 If the Contract shall be terminated under the provision of the last preceding sub-clause the Contractor shall, with all reasonable dispatch, remove from the site all constructional plant and shall give similar facilities to his sub-Contractors to do so.
- 35.8 If the Contract shall be terminated as aforesaid, the Contractor shall be paid by the OMFED/Owner, 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 amount 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 of 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 OMFED/Owner 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 expectation of completion 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 35.1, 35.2 and 35.4.
 - e) The reasonable cost of removal of construction plant under clause 35.7 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 OMFED/Owner under this sub-clause, the OMFED/Owner 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 OMFED/Owner from the Contractor under the terms of the Contract.

DESIGN, MANUFACTURE & SUPPLY OF EQUIPMENT

36.0 INSPECTION AND TESTS:

- a. The OMFED/Owner or its representative shall have the right to inspect and/or test the Goods to confirm their conformity to the Contract and/or the Technical Specifications shall specify what inspections and tests the OMFED/Owner required and where they are to be conducted. The OMFED/Owner shall notify the Contractor in writing of the identity of any representatives, if retained for this purpose.
- b. The inspections and test may be conducted on the premises of the Contractor or his Sub-Contractors at point of delivery and/or at the Goods final destination. Where conducted on the premises of the Contractor or his sub-Contractor(s), all reasonable facilities and assistance including access to drawings and production data shall be furnished to the inspectors at no charge to the OMFED/Owner. In case of any defects or deficiency notified by the OMFED/Owner's inspection authority, the Contractor will rectify and make good the same without delay and not proceed with further processing of such item(s) of goods without obtaining approval from the inspection authority.
- c. Should any inspected or tested goods fail to conform to the Specification, the OMFED/Owner may reject them and the Contractor shall either replace the rejected goods or make all alterations necessary to meet specification requirements free of cost to the OMFED/Owner.
- d. The OMFED/Owner's right to inspect, test and, where necessary, reject the Goods after the Goods arrival at the destination shall in no way be limited or waived by reason of the Goods having previously been inspected, tested and passed by the OMFED/Owner or its representative prior to the Goods despatch.
- e. Nothing in this Clause shall in any way release the Contractor from any warranty or other obligations or test upon completion under this Contract.
- f. Tests upon completion
 - i. The Contractor shall give to the OMFED/Owner 10 days notice of the date after which he will be ready to make the tests of completion (the Test). Unless otherwise agreed, the Tests shall take place within 10 days after the said date on such day or days, as the OMFED/Owner shall notify the Contractor.
 - ii. If the OMFED/Owner fails to appoint a time after having been asked to do so, or does not attend at the time and place appointed, the Contractor shall be entitled to proceed with the Tests in his absence. The Tests shall then be deemed to have been made in the presence of the OMFED/Owner and the results of the Tests shall be accepted as accurate.
 - iii. If the Tests are being unreasonably delayed by the Contractor, the OMFED/Owner may give notice requiring the Supplier to make the tests

within 14 days after the receipt of such notice. The Contractor shall make the test on such days within that period as the Contractor may fix and of which he shall give notice to the OMFED/Owner.

If the Contractor fails to make the Tests within 21 days the OMFED/Owner may proceed with the Tests. All tests so made by OMFED/Owner shall be at the risk and cost of the Contractor and the cost thereof shall be deducted from the Contractor's price. The test shall then be deemed to have been made in the presence of the Contractor and results of the tests shall be accepted as accurate.

- iv. If the goods or any section fails to pass the test, the contractor may require such tests to be repeated on the same terms and conditions. All costs, to which the OMFED may be put to by repetition of the tests under this sub clause or subsequent sub clauses, shall be deducted from the contract price.
- v. If the OMFED/Owner and the Contractor disagree on the interpretation of the test results each shall give a statement of his views to the other within 14 days after such disagreement arises. The statement shall be accompanied by all relevant evidence. The OMFED/Owner will review both the statements and render a final decision within a further period of Seven (7) days, which shall be binding on the Supplier.
- vi. If the goods/works or any Section fails to pass the Test on the repetition thereof under sub-clause 36.iv the OMFED/Owner after due consultation with the Supplier, shall be entitled to:
 - Order one further repetition of Tests under the conditions of sub-clause 36.f.iv.
 - Reject the goods or a section thereof in which event the OMFED shall have the same remedies against the supplier as are provided under sub clause 36.f.xii.
 - Issue a taking over certificate, if the OMFED/Owner so wishes, notwithstanding that the goods are not complete. The Contractor's price shall then be reduced by such amount as may be agreed to by the OMFED/Owner and the Contractor or failing an agreement, as may be determined by arbitration.
- vii. In considering the results of tests carried out under sub- Clause xi and xiv hereof and the OMFED/Owner shall make allowances for the effect of any use of the Goods by him on the performance or other characteristics of the Goods.
- viii. As soon as the Goods/works or any section thereof has passed the tests, the OMFED/Owner shall issue a certificate to that effect.
- ix. The Goods/works shall be accepted by the OMFED/Owner when they have been completed in accordance with the Contract, except in minor respects that do not affect the use of the Goods for their intended purposes and having passed the tests on completion and a taking over certificate has been issued or deemed to have been issued in accordance with sub clause x hereof.

- x. The Contractor may apply by notice to the OMFED/Owner for a taking over certificate not earlier than 10 days before the goods will in the Contractor's opinion be complete and ready for taking over under sub clause ix hereof.

The OMFED/Owner shall within 28 days after the receipt of the Contractor's application either;

- a. Issue the taking over certificate to the Contractor stating the date on which the works were complete and ready for taking over, or
- b. Reject the application giving his reasons and specifying the work required to be done by the Contractor to enable the taking over certificate to be issued.

If the OMFED/Owner fails either to issue the taking over certificate or to reject the Contractor's application within the period of 28 days it shall be deemed to have issued the taking over certificate on the last day of that period.

If the works are divided by the Contract into sections the Contractor shall be entitled to apply for separate taking over certificate for each such section.

- xi. OMFED/Owner shall not use any part of the goods unless taking over certificate has been issued in respect thereof.

If nevertheless, OMFED/Owner uses any part of the Goods that part which is used shall be deemed to have been taken over at the date of such use. OMFED/Owner shall on request of the Contractor issue a taking over certificate accordingly. If OMFED/Owner uses any part of the goods before taking over, the Contractor shall be give the earliest opportunity of taking such steps as may be necessary to carry out the tests on completion.

- xii. If the Contractor fails to remedy a defect or damage pointed out by the OMFED/Owner within a reasonable time the OMFED/Owner may fix a final time for remedying the defect or damage.

If the Contractor fails to do so, OMFED/Owner may:

- a. Carry out the work itself or by others at the Contractor's risk and cost, provided that he does so in a reasonable manner. The costs properly incurred by the OMFED/Owner in remedying the defect or damage shall be deducted from the contract price, but the Contractor shall have no responsibility for such work, or
- b. Require the Contractor to grant the OMFED/Owner a reasonable reduction in the Contract price to be agreed or fixed by arbitration or
- c. If the defect or damage is such that the OMFED/Owner has been deprived of substantially the whole of the benefits of the goods or a part thereof, it may terminate the contract, in respect of such parts of the goods as can not be put to intended use. The OMFED/ Owner shall, to the exclusion of any remedy be entitled to recover all sums paid in respect of such parts of the goods together with the cost of dismantling the same, clearing the site and returning plant to the Contractor or otherwise disposing it in accordance with the Contractor's instructions.

- xiii. If the defect or damage is such that repairs can not be expeditiously carried out on the site, the Contractor may with the consent of OMFED/Owner remove from the site for the purpose of repair any part of the works which is defective or damaged, after furnishing suitable guarantee as may be prescribed by the OMFED/Owner.
- xiv. If the replacement or renewals are such that they may affect the performance of the works, the OMFED/Owner may request that the test on completion be repeated to the extent necessary. The request shall be made by notice within 28 days after the replacement or renewal. The tests shall be carried out in accordance with sub-clauses i& iii hereof.
- xv. Until the final certificate of commissioning has been issued, the Contractor shall have the right of access to all part of the Goods and to the records of the working and performance of the Goods/works.

Such right of access shall be during the normal working hours of OMFED/Owner at the Contractor's risk and cost. Access shall also be granted to any duly authorized representative of the Contractor whose name has been communicated in the writing to the Contractor.

Subject to OMFED/Owner approval, the Contractor may also at his own risk and cost make any test, which he considers desirable.
- xvi. The Contractor shall not be liable for any defect resulting from designs furnished or specified by the OMFED/Owner.
- xvii. The Contractor shall, if required by the OMFED/Owner in writing, search for the cause of any defect, under the directions of the OMFED/Owner. Unless the defect is one for which the Contractor is liable under this clause, the cost of the work carried out by the Contractor in searching for the cause of the defect shall be added to the Contract Price.

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

37.0 PACKING AND FORWARDING

- 37.1 The Contractor shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to temperature, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods final destination and the absence of heavy handling facilities at all points in transit.
- 37.2 The packing, marking and documents within and outside the package shall comply strictly with such special requirements as shall be expressly provided for in the Contract and, subject to Clause 37.3, and any subsequent instructions give by the OMFED/Owner.

- 37.3 Each package shall be marked to indicate:
- a) Name of The Contractor
 - b) Details of items in the
 - c) Name of the Consignee
 - d) Purchase Order number
 - e) Gross, net and tare package. Weights of the item
 - f) Destination

38.0 DELIVERY AND DOCUMENTS

- 38.1 Delivery of the Goods shall be made by the Contractor in accordance with the terms specified by the OMFED/Owner in the Schedule of Requirements and the Special Conditions of Contract.

39.0 INSURANCE

- 39.1 The contractor shall be entirely responsible for insurance as per clause 14.0 of Section - III (Special conditions of contract).
- 39.2 The contractor shall provide a copy of the insurance policy.
- 39.3 In the event of any losses or damages, the Contractor shall,
- a. Initiate and pursue claim till settlement, and
 - b. Promptly make arrangements for repairs and/or replacement of any damaged item/s irrespective of settlement of claim by the underwriters.

40.0 TRANSPORTATION:

- 40.1 The Contractor is required under the Contract to deliver the Goods at Project site, as specified in the Section - I (Instruction to the bidders). Transport of the Goods to the destination shall be arranged and paid for by the Contractor, and the cost thereof shall be included in the Contract Price.
- 40.2 Where the Contractor is required to effect delivery under other terms, for example, by post or to another address in the country, the Contractor shall be required to meet all transport and storage expenses until delivery.

41.0 INCIDENTAL SERVICES

- 41.1 As specified in the Special Conditions of Contract and the Schedule of Requirement, the Contractor may be required to provide any or all of the following services;

- a. Performance or supervision of on site assembly and/or start up the supplied Goods;
- b. Furnishing of tools required for assembly and/or maintenance of the supplied goods;
- c. Furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods;
- d. Operation or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Contractor of any **Warranty obligations** under this Contract;
- e. Conduct training of the OMFED/Owner's personnel, at the Contractor's plant and/or site, in assembly, start up operation, maintenance and/or repair of the supplied Goods.

42.0 SPARE PARTS

- 42.1 As specified in the Special Condition of Contract, the Contractor may be required to provide any or all of the following materials and notifications pertaining to spare parts manufactured or distributed by the Contractor:
- a. Such spare parts as the OMFED/Owner may select to purchase from the Contractor provided that this selection shall not relieve the Contractor of any Warranty obligations under the contract: and
 - b. In the event of termination of production of the spare parts:
 - i. Advance notification to the OMFED/Owner of the pending termination, in sufficient time to the OMFED/Owner to procure his needed requirements; and
 - ii. Following such termination, furnishing at no cost to the OMFED/Owner, the blueprints, drawings and specifications of the spare parts, if and when requested.

43.0 WARRANTY/GUARANTEE FOR GOODS

- 43.1 The Contractor warrants that the Goods supplied 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 Contractor further warrants that the Goods supplied and services performed under this Contract shall have no defect arising from design, materials or workmanship (except insofar as the design or material is required by the OMFED/Owner's specifications) or from any act or omission of the Contractor, that may develop under normal use of the supplied Goods in the conditions obtaining in the country of final destination. The Contractor also guarantees that the Goods supplied shall perform satisfactorily as per the designed/rated/installed capacity as provided for in the Contract.
- 43.2 This warranty/guarantee shall remain valid for the entire defects liability period.

- 43.3 The OMFED/Owner promptly notify the Contractor in writing of any claims arising under this warranty.
- 43.4 Upon receipt of such notice, the Contractor shall, with all reasonable speed, repair or replace the defective Goods or parts thereof, without costs to the OMFED/Owner.
- 43.5 If the contractor, having been notified, fails to remedy the defect(s) within a reasonable period, the OMFED/Owner may proceed to take such remedial action as may be necessary, at the contractor's risk and expense and without prejudice to any other rights which the OMFED/Owner may have against the Contractor under the Contract.
- 43.6 This warranty/guarantee shall not cover any damage/s resulting from normal wear and tear or improper handling by the OMFED/Owner or his authorized representatives.

CIVIL WORKS

44.0 INSPECTION OF SITE

- 44.1 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.

45.0 WORK TO BE TO THE SATISFACTION OF ENGINEER

- 45.1 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.

46.0 PROGRAMME TO BE FURNISHED

- 46.1 The Contractor shall after the acceptance of his Tender, submit to the Engineer for his approval a programme 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.
- 46.2 If at any time it should appear to the Engineer that the actual progress of the Works does not conform to the approved programme referred to in sub-clause 46.1 of this Clause, the Contractor shall produce, at the request of the Engineer, a revised program showing the modifications to the approved programme necessary to ensure completion of the Works within the time for completion as defined in Clause 88 hereof.

- 46.3 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.
- 46.4 The programme shall be reviewed every 15 days, revised and shall include a chart of the principal quantities of work forecast for execution fortnightly and a schedule of payments expected to be made to the Contractor by the OMFED/Owner.

47.0 SETTING-OUT

- 47.1 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 OMFED/Owner. 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.

48.0 BORE HOLES AND EXPLORATORY EXCAVATION

- 48.1 If, at any time during the execution of the Works, the Engineer shall require the Contractor to make bore holes 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 23 hereof, unless a provisional sum in respect of such anticipated works shall have been included in Schedule of Quantities.

49.0 WATCHING AND LIGHTING

- 49.1 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.

50.0 CARE OF WORKS

- 50.1 From the commencement of the Works until the date stated in the Certificate of Completion for the whole of the Works pursuant to Clause 21 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 responsibility for the care of that part should pass to the Owner/OMFED. 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 50.3 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 65 hereof, repair and make good the same as aforesaid at the cost of the OMFED/Owner. The Contractor shall also be liable for any damage to the works occasioned by him in the course of any operation carried out by him for the purpose of completing any outstanding work or complying with his obligations under Clause 66 or 22 hereof.

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

50.3 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 radiations 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 traveling at sonic or supersonic speeds, or any such operation of the forces of nature as an experienced Contractor could not foresee, or reasonably make provision for or insure against all of which are herein collectively referred to as "the excepted risks".

51.0 INSURANCE OF WORKS

- 51.1 Without limiting his obligations and responsibilities under Clause 50 hereof, the Contractor shall prior to the commencement of the Works insure in the joint names of the OMFED/Owner and the Contractor against all loss or damage 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 OMFED/Owner and the Contractor are covered for the period stipulated in Clause 50.1 hereof and are also covered during the Period of Maintenance for loss or damage arising from a cause, occurring prior to the commencement of the Period of maintenance, and for any loss or damage occasioned by the Contractor in the course of any operations carried out by

him for the purpose of complying with his obligations under Clause 66 and 22 hereof :-

- a) The Works for the time being executed to the estimated current Contract value 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/OMFED the policy or policies of insurance and the receipts for payments of the current premiums.

52.0 DAMAGE TO PERSONS AND PROPERTY

52.1 The Contractor shall, except if and so far as the Contract provides otherwise, indemnify the OMFED/Owner against all losses and claims in respect of injuries or damage to any person or materials or physical damage to any property whatsoever which may arise out of or in consequence of the execution and maintenance of the Works 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 OMFED/Owner to execute the Works or any part thereof on over, under 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 directly 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.

52.2 The OMFED/Owner shall indemnify the Contractor against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the proviso to sub-clause (1) of this Clause.

53.0 THIRD PARTY INSURANCE

- 53.1 Before commencing the execution of the Works the Contractor, but without limiting his obligations and responsibilities under Clause 52 hereof, shall insure against liability for any material or physical damage, loss or injury which may occur to any property, including that of the owner/OMFED or to any person, including any employee of the owner/OMFED, 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 proviso to Clause 52.1 hereof.
- 53.2 Such insurance shall be effected with an insurer for at least the amount stated in the Appendix to the Tender. The Contractor shall, produce to the Engineer/OMFED the policy or policies of insurance and receipts for payment of the current premiums.
- 53.3 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 OMFED/Owner, the insurer will indemnify the OMFED/Owner against such claims and any costs, charges and expenses in respect thereof.
- 53.4 Such insurance shall be for an amount not less than Rs.1,00,000/- per occurrence, with the number of occurrences unlimited.

54.0 ACCIDENT OR INJURY TO WORKMEN

- 54.1 The OMFED/Owner shall not be liable for or in respect of any damages or compensation payable at law in respect of 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 OMFED/Owner 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 OMFED/Owner, the Contractor shall imply himself as a party as if the case has been instituted against the Contractor.
- 54.2 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/OMFED such policy of insurance and the receipts for the payment of the current premium. Provided always that, in respect of any persons 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 OMFED/Owner is indemnified under the policy, but the Contractor, shall require such sub-contractor to produce to the Engineer/OMFED such policy of insurance and receipt for the payment of the current premium.

54.3 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/OMFED harmless from any liabilities or penalties which may be imposed by the Central, state or local authorities by reason of any asserted violation by the Contractor or sub-contractor of the ESI Act, 1948 and also from all claims, suits or proceedings that may be brought against the Owner/OMFED 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 subdivision 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, who are employed 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 employee's 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/OMFED shall retain such amount as may be necessary from the total Contract value until the Contractor shall furnish satisfactory proof that the whole contribution as required by the ESI Act have been paid.

54.4 Provident Fund & Misc. Provisions Act

The contractor shall discharge liabilities under the Employees Provident Fund & Misc. Provisions Act, 1952 & Rules made there under in respect of its establishment for fulfillment of contractual obligations with OMFED. In the event of failure of the contractor or to discharge the liabilities under the above said Act, then the contractor shall defend the proceedings, if any, so brought out against OMFED and consequently bear the cost of such litigation and penalties imposed for such failure by the contractor.

55.0 REMEDY ON CONTRACTOR'S FAILURE TO INSURE

- 55.1 If the Contractor shall fail to effect and keep in force the insurances referred to in Clauses 51, 53 and 54 hereof, or any other insurance which he may be required to effect under the terms of the Contract, then and in any such case the OMFED/Owner may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the OMFED/Owner as aforesaid from any payment due or which may become due to the Contractor, or recover the same as a debt to the Contractor, or recover the same as a debt due from the Contractor.

56.0 GIVING OF NOTICES AND PAYMENT OF FEES

- 56.1 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.
- 56.2 The Contractor shall conform in all respects with the provision 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 OMFED/Owner indemnified against all penalties and liability of every kind for breach of any such Statute, Ordinance, Law, regulation or bye law.
- 56.3 The OMFED/Owner will repay or allow to the Contractor all such sums as the Engineer/OMFED shall certify to have been properly payable and paid by the Contractor in respect of such fees.

57.0 FOSSILS ETC.

- 57.1 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 OMFED/Owner and the Contractor be deemed to be the absolute property of the OMFED/Owner. 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.

58.0 INTERFERENCE WITH TRAFFIC AND ADJOINING PROPERTIES

- 58.1 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 OMFED/Owner or of any other person. The Contractor shall save harmless and indemnify the OMFED/Owner 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.

59.0 EXTRAORDINARY TRAFFIC

- 59.1 The Contractor shall use every reasonable means to prevent any 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.
- 59.2 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.

59.3 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 OMFED/Owner in respect thereof and in respect of all claims, proceeding, damages, costs, charges and expenses in relation thereto.

59.4 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 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

60.0 OPPORTUNITIES FOR OTHER CONTRACTORS

60.1 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 OMFED/Owner and their workmen and to the workmen of the OMFED/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 of any Contractor which the OMFED/Owner 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 OMFED/Owner or any such authority, any roads or ways for the maintenance of which the Contractor is responsible, or permit the use by any of the Contractor's scaffolding or other plant on the Site, or provide any other service of whatsoever nature, the OMFED/Owner 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.

61.0 CONTRACTOR TO KEEP SITE CLEAR

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

62.0 CLEARANCE OF SITE ON COMPLETION

62.1 On the completion of the Works the Contractor 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 workman like condition to the satisfaction of the Engineer.

63.0 EXAMINATION OF WORK BEFORE COVERING UP

- 63.1 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 foundation is or are ready 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.
- 63.2 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 63.1 and are found to be executed in accordance with the Contract, the expenses of uncovering, making opening in or through, reinstating and making good the same shall be borne by the OMFED/Owner, but in any other case all costs shall be borne by the Contractor.

64.0 REMOVAL OF IMPROPER WORK AND MATERIALS

- 64.1 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 time 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, or any work which in respect of materials of workmanship is not, in the opinion of the Engineer, in accordance with the Contract.
- 64.2 In case of default on the part of the Contractor in carrying out such order, the OMFED/Owner 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 OMFED/Owner or may be deducted by the OMFED/Owner from any payment due or which may become due to the Contractor.

65.0 SUSPENSION OF WORK

- 65.1 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 OMFED/Owner 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 OMFED/Owner or from any of the excepted risks defined in Clause 50 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.

- 65.2 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) or sub-clause 39.1 of this contract, 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 22 hereof, or, where it affects the whole Works, as an abandonment of the Contract by the OMFED/Owner.

MAINTENANCE AND DEFECTS

(DEFECT LIABILITY)

66.0 DEFINITION OF PERIOD OF MAINTENANCE

- 66.1 In these Conditions the expression "Period of Maintenance" shall mean the period of maintenance named in the Appendix to the tender, calculated from the date of the completion of the Works, certified by the Engineer in accordance with Clause 21 hereof, or, in the event of more than one certificate having been issued by the Engineer under the said Clause, from the respective dates so certified and in relation to the Period of Maintenance the expression "the Works" shall be construed accordingly.
- 66.2 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 OMFED/Owner in the Condition required by the contract, fair wear and tear excepted, 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 21 hereof, as soon as practicable after which date and shall execute all such work of repair, amendment, reconstruction, rectification and making good defects, imperfections, shrinkages 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 in behalf of the Engineer prior to its expiry.

- 66.3 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.
- 66.4 If the Contractor shall fail to do any such work as aforesaid required by the Engineer, the OMFED/Owner 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 OMFED/Owner or may be deducted by the OMFED/Owner from any payment due or which may become due to the Contractor.

67.0 INSPECTION & TESTS

- a. The Owner/OMFED 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.
- b. 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, gang ways, etc. and the necessary attendance to move and adopt as directed for inspection or measurement of the works by the Engineer's Representative.
- c. 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.

ERECTION & COMMISSIONING OF EQUIPMENT

68.0 SUFFICIENCY OF TENDER

The Contractor by bidding shall be deemed to have satisfied himself as to all the conditions and circumstances affecting the Contract Price, as to the possibility of executing the works as shown and described in the Contract, as to the general circumstances at the site of works, as to the general labour position at site and to have determined the prices accordingly.

69.0 PROGRAMME OF INSTALLATION AND COMMISSIONING

As soon as practicable after the acceptance of the bid, the Contractor shall submit to the OMFED/Owner for his approval a comprehensive programme in the form the PERT network/bar chart and any other form as may be required by the OMFED/Owner showing the sequence

Or

Order in which the Contractor proposes to carryout the works including the design, manufacture, delivery to site, erection and commissioning thereof. After submission to and approval by the OMFED/Owner of such programme, the Contractor shall adhere to the sequence or order and method stated therein. The submission to and approval by the OMFED/Owner of such programme shall not relieve the contractor of any of his duties or responsibilities under the Contract. The programme approved by the OMFED/Owner shall form the basis of evaluating the pace of all works to be performed by the Contractor. The Contractor shall update the PERT Network every month, submit it to the OMFED/Owner and shall inform the OMFED/Owner the progress on all the activities falling on schedule for the next reporting date.

70.0 PREPARATION OF DRAWINGS FOR APPROVAL

The Contractor should visit the site to acquaint himself in respect of existing site conditions and to know the details/information required for understanding the nature and type of civil construction works involved in the project.

The Contractor shall submit to the OMFED/Owner for approval:

- a) Within the time given in the specification or in the programme, such drawings, samples, patterns and models as may be called for therein, and in numbers therein required.
- b) During the progress of works and within such reasonable times as the OMFED/Owner may require such drawings of the general arrangement and details of the works as the OMFED/Owner may require.

The specifications/conditions concerning the submission of drawings by the Contractor are detailed as under:

- a. Within four weeks from the date of receipt of the order, Contractor shall furnish a list of all necessary drawings as briefly described below which the Contractor shall submit for approval, identifying each drawings by a serial number and descriptive title and expected date of submission. This list shall be revised and

extended if necessary, during the progress of work depending on the nature of the contract.

The OMFED/Owner shall signify his approval or disapproval of all drawings or such drawings that would affect progress of the contract as per the agreed programme.

Brief list of drawings:

- i. Equipment drawings for fabricated items.
- ii. Architectural & structural drawings for all civil structures.
- iii. Interconnecting piping & valve layouts for different ETP units.
- iv. Electrical cables, conduit/cable tray, push button station layout.
- v. Other miscellaneous drawing as required for erection work.
- vi. Site plan showing all units & pathway details.
- vii. Hydraulic flow diagram.
- viii. Any other drawing as per requirement of the engineer.

Drawings showing fabrication details dimensions, layouts and bill of materials submitted for approval shall be signed by responsible representative of Contractor and shall be to any one of the following sizes in accordance with Indian standards: A0, A1, A2, A3, and A4.

All drawings shall show the following particulars in the lower right hand corner in addition to Contractor's name:

- i. Name of the Consultant
- ii. Name of the Owner
- iii. Project title
- iv. Title of drawing
- v. Scale
- vi. Date of drawing
- vii. Drawing number

In addition to the information provided on drawings, each drawing shall carry a revision number, date of revision and brief description of revision carried out. Whenever any revision is carried out, correspondingly revision number must be updated.

All dimensions on drawings shall be in metric units.

Drawings (three sets) submitted by the Contractor for approval will be checked, reviewed by the OMFED/Owner, and comments, if any, on the same will be conveyed to the Contractor. It is the responsibility of the Contractor to incorporate correctly all the comments conveyed by the OMFED/Owner on the Contractor's drawings. The drawings, which are approved with comments, are to be re submitted to the OMFED/Owner for purpose of records. **Such drawings will not be**

checked/reviewed by the OMFED/Owner to verify whether all the comments have been incorporated by the Contractor. If the Contractor is unable to incorporate any comments in the revised drawings, Contractor shall clearly state in his forwarding letter such non-compliance along with the valid reasons.

Drawings prepared by the Contractor and approved by the OMFED/Owner shall be considered as a part of the specifications. However, the examination of the drawings by the OMFED/Owner shall not relieve the Contractor of his responsibility for engineering design, workmanship, and quality of materials, warranty obligations and satisfactory performance on installation covered under the Contract.

If at any time before completion of the work, changes are made necessitating revision of approved drawings, the Contractor shall make such revisions and proceed in the same routine as for the original approval.

Date of submission

In the event, the drawings submitted for approval require many revisions amounting to redrawing of the same then the date of submission of the revised drawings would be considered as the date of submission for approval.

The contractor shall furnish to the OMFED/Owner before the works are taken over, Operation and Maintenance instructions together with Drawings of the works as completed, in sufficient detail to enable the OMFED/Owner to maintain, dismantle, reassemble and adjust all parts of the works. Unless otherwise agreed, the works shall not be considered to be completed for the purpose of taking over until such instructions and drawings have been supplied to the OMFED/Owner.

71.0 CONTRACTOR'S SUPERINTENDENCE AND DEPLOYMENT OF ERECTION TEAM AND CONDUCT OF PERSONNEL

The Contractor shall employ one or more competent representatives, whose name or names shall have previously been communicated in writing to the OMFED/Owner by the Contractor to superintend and carrying out the works on the site. The said representative or if more than one shall be employed, then one of such representatives shall be present on the site during all times, and any orders or instructions which the OMFED/Owner may give to the said representative of the Contractor shall be deemed to have given to the Contractor.

The said representative shall have full technical capabilities and complete administrative and financial powers to expeditiously and efficiently execute the work under the Contract.

The Contractor shall, execute the works with due care and diligence with the time for completion and employ Contractor team comprising qualified and experienced engineers together with adequate skilled, semi skilled and unskilled workmen on the site for carrying out the works.

The Contractor shall ensure adequate work force to keep the required pace at all times as per the schedule of the completion. The Contractor shall also ensure availability of competent engineers during commissioning/start up, trial runs. Operation of the plant/equipment till handing over of the plant.

The Contractor shall furnish the details of qualifications and experience of their senior supervisors and engineers assigned to the work site, including their experience in supervising erection and commissioning of plant and equipment of comparable capacity.

When the Contractor or his representative is not present on any part of the work where it may be desired to give directions in the event of emergencies, orders may be given by the OMFED/Owner and shall be received and observed by the supervisors or foremen who may have charge of the particular part of work in reference to which orders are given. Any such instructions, directions or notices given by the OMFED/Owner shall be deemed to have been given to the Contractor.

The Contractor shall furnish to the OMFED/Owner a fortnightly labour force report showing by classifications the number of employees engaged in the work. The Contractor's employment records shall include any reasonable information as may be required by the OMFED/Owner. The Contractor should also display necessary information as may be required by statutory regulations.

None of the Contractor's supervisors, engineers or labourers may be withdrawn from the work without notice to the OMFED/Owner and further no such withdrawals shall be made if in the opinion of OMFED/Owner, it will adversely affect the required pace of progress and/or the successful completion of the work.

The OMFED/Owner shall be at liberty to object to any representative or person skilled, semi skilled or unskilled worker employed by the Contractor in execution of or otherwise about the works who shall, in the opinion of the OMFED/Owner, misconduct himself or be incompetent, or negligent or unsuitable, and the Contractor shall remove the person so objected to, upon receipt of notice in writing from the OMFED/Owner and shall provide in that place a competent representative at Contractor's own expense within a reasonable time.

In the execution of the works no persons other than the Contractor, sub-Contractor and their employees shall be allowed on the site except by written permission of OMFED/Owner.

72.0 OMFED/OWNER'S INSTRUCTIONS

The OMFED/Owner may in his absolute discretion, issue from time to time drawings and/or instructions, directions and clarifications which are collectively referred to as OMFED/Owner's instructions in regard to:

Any additional drawing and clarifications to exhibit or illustrate details.

Variations or modifications of the design, quality or quantity of work or additions or omissions or substitution of any work.

Any discrepancy in the drawings or between the schedule of quantities and/or specifications.

Removal from the site of any material brought there by the Contractor, which are unacceptable to the OMFED/Owner and the substitution of any other material thereof.

Removal and/or re-execution of any work erected by the Contractor, which are unacceptable to the OMFED/Owner.

Dismissal from the work of any persons employed there upon who shall in the opinion of the OMFED/Owner, misconduct him, or be incompetent or negligent.

Opening up for inspection of any work covered up.

Amending and making good of any defects.

73.0 RIGHTS OF THE OMFED/OWNER

73.1 Rights to direct works:

The OMFED/Owner shall have the right to direct the manner in which all works under this contract shall be conducted, insofar as it may be necessary to secure the safe and proper progress and specified quality of the works. All work shall be done and all materials shall be furnished to the satisfaction and approval of the OMFED/Owner.

Whenever in the opinion of the OMFED/Owner. The Contractor has made marked departures from the schedule of completion or when circumstances or requirement force such a departure from the said schedule, the OMFED/Owner, in order to ensure compliance with the schedule, shall direct the order, pace and method of conducting the work, which shall be adhered to by the Contractor.

If in the judgment of the OMFED/Owner, it becomes necessary at any time to accelerate the overall pace of the plant erection work, the Contractor, when directed by the OMFED/Owner, shall cease work at any particular point and transfer Contractor's men to such other point or points and execute such works as may be directed by the OMFED/Owner and at the discretion of the OMFED/Owner.

73.2 Right to order modifications of methods and equipment

If at any time the Contractor's methods, materials or equipment appear to the OMFED/Owner to be unsafe, inefficient or inadequate for securing the safety or workmen or the public, the quality of work or the rate of progress required, the OMFED/Owner may direct the Contractor to ensure safety, and increase their efficiency and adequacy and the Contractor shall promptly comply with such directives. If at any time the Contractor's working force and equipment are inadequate in the opinion of the OMFED/Owner, for securing the necessary progress as stipulated, the Contractor shall if so directed, increase the working force and equipment to such an extent as to give reasonable assurance of compliance with the schedule of completion. The absence of such demands from the OMFED/Owner shall not relieve the Contractor of his obligations to secure the quality, the safe conducting of the work and the rate of progress required by the contract. The Contractor alone shall be and remain liable and responsible for the safety, efficiency and adequacy of Contractor's methods, materials, working force and equipment, irrespective of whether or not the Contractor makes any changes as a result of any order or orders received from the OMFED/Owner.

73.3 Right to inspect the work

The OMFED/Owner representative shall be given full assistance in the form of the necessary tools, instruments, equipment and qualified operators to facilitate inspection.

The OMFED/Owner reserves the right to call for the original test certificates for all the materials used in the erection work.

In the event, the OMFED/Owner's inspection reveals poor quality of work/materials, the OMFED/Owner shall be at liberty to specify additional inspection procedures if required, to ascertain Contractor's compliance with the specifications of erection work.

Even though inspection is carried out by the OMFED/Owner or their representatives, such inspection shall not, however, relieve the Contractor of any or all responsibilities as per the contract, nor prejudice any claim, right or privilege which the OMFED/Owner may have because of the use of defective or unsatisfactory materials or bad workmanship.

74.0 CONTRACTOR'S FUNCTIONS

The Contractor shall provide everything necessary for proper execution of the works, according to the drawings, schedule of quantities and specifications taken together whether the same may or may not be particularly shown or described therein, provided that the same can reasonably be inferred therefrom and if the Contractor finds any discrepancy therein, he shall immediately refer the same to the OMFED/Owner whose decision shall be final and binding on the Contractor.

The Contractor shall proceed with the work to be performed under this contract in the best and workman like manner by engaging qualified and efficient workers and finish the work in strict conformance with the drawings and specifications and any changes/modifications thereof made by the OMFED/Owner.

The work shall be carried out as approved by the OMFED/Owner or his authorized representative/s from time to time, keeping in view the overall schedule of completion of the project. The Contractor's job schedule must not disturb or interfere with OMFED/Owner's or the other Contractor's schedules of day-to-day work. The OMFED/Owner will provide all reasonable assistance for carrying out the jobs.

Night work will be permitted only with prior approval of the OMFED/Owner. The OMFED/Owner may also direct the Contractor to operate extra shifts over and above normal day shift to ensure completion of contract as per schedule. Adequate lighting wherever required should be provided by the Contractor at no extra cost. The Contractor should employ qualified electricians and wire men for these facilities. In case of OMFED/Owner's failure to provide these facilities and personnel, the OMFED/Owner has the right to arrange such facilities and personnel and to charge the cost thereof to the Contractor.

The Contractor shall have to arrange for insurance of all the items brought by him to the site for use during the execution of the contract, till handing over of the complete job.

The OMFED/Owner 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, save and except an accident or injury resulting from any act or default of the OMFED/Owner, his agents, or servants. The Contractor shall indemnify and keep indemnified the OMFED/Owner against all such damages and compensation, save and except as aforesaid and against all claims, proceedings, cost, charges and expenses whatsoever in respect thereof or in relation thereto.

The Contractor shall insure against such liability with an insurer approved by the OMFED/Owner, which approval shall not be unreasonably withheld, and shall continue such insurance during the whole of the time that any persons are employed by him on the works shall, when required, produce to the OMFED/Owner or OMFED/Owner's representative such policy of insurance and the receipt for payment of the current premium. Provided always that, in respect of any persons employed by any sub-Contractor, the Contractor's obligations 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 OMFED/Owner is indemnified under the policy, but the Contractor shall required such sub-Contractor to produce the OMFED/Owner's representative, when required, such policy of insurance and receipt for the payment of the current premium.

Whenever proper execution of the work under the contract depends on the jobs carried out by some other Contractor, in such cases the Contractor should inspect all such erection and installation jobs and report to the OMFED/Owner regarding any defects or discrepancies. The contractor's failure to do so shall constitute as acceptance of the other contractor's installation /jobs as fit & proper for the reception of the contractor's works except those defects which may develop after execution.

The Contractor should also report any discrepancy between the executed work and the drawings.

The Contractor shall extend all necessary help/co- operation to other Contractor's working at the site in the interest of the work.

The Contractor shall keep a check on deliveries of the equipment covered in the scope of erection work and shall advise the OMFED/Owner well in advance regarding possible hold up in the contractor's work due to the likely delay in delivery of such equipment/components to enable him to take remedial actions.

75.0 DUTIES OF THE CONTRACTOR VIS-A-VIS OMFED/OWNER

The equipment and the items, if any, to be supplied by the OMFED/Owner for erection, testing and commissioning by the Contractor, shall be as listed in the Contract.

76.0 SUPPLY OF TOOLS, TACKLES AND MATERIALS

The Contractor shall, at his own expense, provide all the necessary equipment, tools and tackles, haulage power, consumables necessary for effective execution and completion of the works during erection and commissioning.

77.0 PROTECTION OF PLANT

The OMFED/Owner shall not be responsible or held liable for any damage to person or property consequent upon the use, misuse or failure of any erection tools and equipment used by the Contractor or any of his sub Contractor's even though such tools and equipment may be furnished, rented or loaned to the Contractor or any of his sub-Contractors. The acceptance and/or use of any such tools and equipment by the Contractor or his sub Contractor shall be construed to mean that the Contractor accepts all responsibility for and agrees to indemnify and save the OMFED/Owner from any and all claims for said damages resulting from the said use, misuse or failure of such tools and equipment.

The Contractor or his sub-Contractor shall be responsible, during the works, for protection of work, which has been completed by the other Contractors. Necessary care must be taken to see that no damage to the same is caused by the Contractor's men during the course of execution of the work.

All other works completed or in progress as well as machinery and equipment that are liable to be damaged by the Contractor's work shall be protected by the Contractor and protection shall remain and be maintained until its removal is directed by the OMFED/Owner. The Contractor shall effectively protect from the effects of weather and from damages or defacement and shall cover appropriately, wherever required, all the works for their complete protection.

The contractor shall carry out the work without damage to any work and property adjacent to the area of the Contractor's work to whomsoever it may belong and without interference with the operation of existing machines or equipment. Adequate lighting, guarding and watching at and near all the storage handling, fabrication, pre-assembly and erection sites for properly carrying out the work and for safety and security shall be provided by the Contractor at his cost. The Contractor should adequately light the work area during nighttime also. The Contractor should also engage adequate electricians/wire men, helper etc. to carry out and maintain these lighting facilities. If the Contractor fails in this regard, the OMFED/Owner may provide lighting facilities as it may deem necessary and charge the cost thereof to the Contractor.

The Contractor shall take full responsibility for the care of the works or any section or portions thereof until the date stated in the taking over certificate issued in respect thereof and in case any damage or loss shall happen to any portion of the works not taken over as aforesaid, from any cause whatsoever, the same shall be made good by at the sole cost of the Contractor and to the satisfaction of the OMFED/Owner. The Contractor shall also be liable for any loss or damage to the works occasioned by the Contractor or his sub-Contractor in the course of any operations carried out by the contractor or his sub-Contractors for the purpose of completing any outstanding work or complying with the Contractor's obligations.

78.0 UNLOADING, TRANSPORTATION AND INSPECTION

The Contractor shall be required to unload all the materials/equipment from the carriers, those received at site after Contractor's team arrives at site. If any of contractor's equipment/material reaches site prior to contractor's site team reaches site, the unloading and shifting of equipment shall be arranged by OMFED/Owner and all expenditure for the same shall be debited to the contractor on actual. The Contractor shall plan in advance, based on the information received from the OMFED/Owner, Contractor's requirement of various tools, tackles, jacks, cranes, sleepers etc, required to unload the material/equipment promptly and efficiently. The Contractor shall ensure that adequate and all measures necessary to avoid any damage whatsoever to the equipment at the time of unloading are taken.

Any demurrage/detention charges incurred due to the delay in unloading the material/equipment and releasing the carrier shall be charged to the Contractor's account.

The Contractor shall be responsible for the reception on site of all plant and contractor's equipment delivered for the purpose of the contract.

The Contractor shall safely transport/shift the unloaded materials/equipment by the Contractor to the storage area.

The materials/equipment would be carefully unpacked by the opening the wooden cases/other modes of packing as the case may be.

All the information and observations by the Contractor shall be furnished in the form of 'INSPECTION REPORT' to the OMFED/Owner with specific mention/suggestions, which in the opinion of the Contractor should be given due consideration and immediate necessary actions. The contractor shall arrange repair or replacement well in time and avoid delays due to non-availability of equipment and parts at the time of their actual need.

The protection, safety and security of the materials shall be the responsibility of the contractor, until they are handed over to the OMFED/Owner after erection, commissioning and testing as per the terms of the Contract.

79.0 STORAGE OF EQUIPMENT

The Contractor shall be responsible for the proper storage and maintenance of all materials/equipment under the Contractor's custody. The Contractor shall take all required steps to carry out frequent inspection of equipment/materials stored as well as erected until the same are taken over by the OMFED/Owner. The following procedure shall apply for the same:

The Contractor's inspector shall check stored and installed equipment/materials to observe signs of corrosion, damage to protective coating to parts, open ends in pipes, vessels and equipment, insulation resistance of electrical equipment etc. The Contractor shall immediately arrange a coat of protective painting whenever required. A record of all observations made on equipment, defects noticed shall be promptly communicated to the OMFED/Owner and OMFED/Owner's advice taken regarding such repairs/rectifications. The Contractor shall there upon carry out such

repairs/rectifications at his own cost. In case the Contractor is not competent to carry out such repairs/rectifications, the OMFED/Owner reserves the right to get this done by other competent agencies at the Contractor's responsibility and risk and the entire cost for the same shall be recovered from the Contractor's bills.

The Contractor's inspector shall also inspect and provide lubrication to the assembled equipment. The shafts of such equipment shall be periodically rotated to prevent rusting as well as to check freeness of the same.

The Inspector shall check for any signs of moisture or rusting in any equipment.

If the commissioning of equipment is delayed after installation of the equipment, the Contractor shall carry out all protective measures suggested by the OMFED/Owner during such period.

Adequate security measures shall be taken by the Contractor to prevent theft and loss of materials handed over to the Contractor by the OMFED/Owner. The Contractor shall carry out periodical inventory checks of the materials received, stored and installed by the Contractor and any loss noticed shall be immediately reported to the OMFED/Owner. A proper record of these inventories shall be maintained by the Contractor. The Contractor should not sell, assign, mortgage, hypothecate or remove equipment or materials which has been installed or which may be necessary for completing the work without the written consent of the OMFED/Owner.

Suitable grease recommended for protection of surface against rusting (refined from the petroleum oil with lanolin minimum (70 DEG. CENT.) and water in traces) shall be applied over all equipment as required once in every six months.

All equipment shall be stored inside a closed shed or in the open depending upon whether they are of indoor or outdoor design.

All the necessary items/good required for protection as described above shall be arranged by the Contractor and such cost shall be included in the Contract price.

80.0 APPROVALS

The Contractor shall obtain the necessary **Approval & Consent of the State Pollution Control Board** and any other state and local authorities as may be required and the cost of obtaining such approvals shall be included in the contract price. However any statutory fees paid shall be reimbursed by the owner on the production of **Documentary evidence**.

All necessary details, drawings, submission of application and proformas will be furnished by the Contractor to the OMFED/Owner for verification/ signature.

81.0 REVIEW AND CO-ORDINATION OF ERECTION WORK

The Contractor shall depute senior and competent personnel to attend the site co-ordination meetings that would generally be held at the site every month. The Contractor shall take necessary action to implement the decision arrived at such meetings and shall also update the erection schedule.

82.0 MECHANICAL INSTALLATION

The installation work would comprise of:

- a) General installation i.e. positioning and installing all the processing, miscellaneous and service equipment as per approved layout drawings and as per the contract.
- b) Supply and installation of structural platform and tables.
- c) Supply and installation of all service and product piping including ancillary items.
- e) Interconnections of services and electrical with equipment.
- f) Guide line for expansion work.
- g) Clean up of work site.
- h) Supply of all cleaning chemicals and lubricants.
- i) Testing, commissioning and start-up.
- j) Painting including supply of paints as approved by the OMFED/Owner.

Detailed specifications are given in the subsequent clauses.

83.0 GENERAL INSTALLATION

83.1 Position of Equipment

The work involves preparation of access for moving of the plant and equipment including their fittings from the work site godown or from the place within the site where they have been unloaded to the place of erection, decrating and placing on the foundation wherever required. All the civil foundations as per the manufacturer's drawings shall also be carried out by the Contractor. The Contractor shall place the equipment and carry out final adjustment of the foundations including alignment and dressing of foundation surface, embedding and grouting of anchor bolts and bedplates. The contractor shall be responsible for obtaining correct reference lines for purpose of fixing the alignment of various equipment from master benchmarks provided by the OMFED/Owner. Tolerances shall be as specified in equipment manufacturers drawings or as stipulated by the Engineer. No equipment shall be permanently bolted down to foundations or structure until the alignment has been checked by the Contractor and witnessed by the OMFED/Owner. The Contractor shall carry out minor alterations in the anchor bolts, pockets etc. at no extra cost and set the equipment properly as per approved layout, drawings and manufacturer's instructions. The Contractor shall supply all the necessary foundation/anchor bolts and bedplates if required without extra cost.

The Contractor shall supply, fix and maintain, at his own cost, during the erection work, all the necessary centering, scaffolding, staging required not only for proper execution and protection of the said work but also for protection of the surrounding plant and equipment. The Contractor shall take out and remove any or all such centering, scaffolding, staging, planking etc. as occasion shall require or when ordered to do so and shall fully rein state and make good all things disturbed during execution of the work, to the satisfaction of the OMFED/Owner. The Contractor shall be paid no additional amount for the above.

84.0 INTERCONNECTION OF SERVICE AND ELECTRICAL WITH EQUIPMENT

The Contractor shall lay service piping and provide connection with the equipment complying strictly with the equipment manufacturer's instructions. The Contractor shall also carry out all the interconnecting service piping with the various items of plant/system. The work shall be complete with capillary piping if required and connections with instruments & controls supplied with the equipment.

The Contractor shall also carry out electrical connections for equipment with the control panels including equipment lighting as per the wiring diagrams of the equipment.

Connection shall be made for small electrically operated devices on equipment installed as accessories to, or assembled with equipment. Connections regarding instruments, float switches, limit switches, pressure switches, thermostats and other miscellaneous equipment shall be done as per manufacturer's drawings & instructions.

85.0 CLEAN UP OF WORKS SITE

All soils, filth or other matters of an offensive nature taken out of any trench, drain or other places shall not be deposited on the surfaces, but shall at once be carted away by the Contractor from the site of work for proper disposal.

The Contractor shall not store or place the equipment, materials or erection tools on the drive ways and passages and shall take care that his work in no way restricts or impedes traffic or passage of men and materials during erection, the Contractor shall without any additional payment, at all time keep the working and storage area used by him free from accumulation of dust or combustible materials, waste materials, rubbish, packing, wooden planks to avoid fire hazards and hindrance to other works.

If the Contractor fails to comply with these requirements in spite of written instructions from the OMFED/Owner, the OMFED/Owner will proceed to clear these areas and the expenses incurred by the OMFED/Owner in this regard shall be payable by the Contractor. Before completion of the work, the Contractor shall remove or dispose off in a satisfactory manner all scaffolding, temporary structures, waste and debris and leave the premises in a condition satisfactory to the OMFED/Owner. Any packing materials received with the equipment shall remain as the property of the OMFED/Owner and may be used by the Contractor on payment of standard charges to the OMFED/Owner and with prior approval of the OMFED/Owner. At the completion of his work and before final payment, the

Contractor shall remove and shall restore the site to neat workman like conditions at his cost.

86.0 TESTING, COMMISSIONING AND START-UP

Before plant start-up, all concrete water retaining structures shall be tested for water tightness and after ensuring that they satisfactorily hold water without any leakages further start-up action shall be initiated after obtaining clearance of the Engineer in this regard.

The Contractor shall operate, maintain and give satisfactory trial run of the plant for a period of one month at the rated output. All rectification of damages/defects and routine trouble shooting should be carried out by the Contractor. During this period, the Contractor shall incorporate/execute necessary minor modifications during the trial period for maximizing operational efficiency. The Contractor should also execute minor modifications as may be suggested by the OMFED/Owner. The Contractor shall suggest recommended log sheet proformas for recording necessary operating data and pass it on to the OMFED/Owner in proof of satisfactory rated output and performance of the equipment/plant.

The commissioning shall also include the following for each equipment:

Field dis-assembly and assembly.

Clean out of lubrication system.

Clean out and check out of all the interconnecting piping and service lines.

Check out and commissioning of instruments and equipment.

Recharging or make up filling of lubricant oil up to the desired level in the lubrication system of individual equipment.

Operation in empty condition to check general operation details wherever required and wherever possible.

Closed loop dynamic testing with water wherever required.

Operation under load and gradual load increase to attain maximum rated output.

Trouble shooting during the trial period.

The Contractor shall demonstrate proper working of all mechanical and electrical controls; safety and protective device, in presence of the Engineer and the same should be duly recorded.

After satisfactory commissioning and start-up the Contractor shall keep his representative under whose supervision the OMFED/Owner staff shall be operating and maintaining the plant and equipment for a minimum period of one month. The Contractor's representatives should be present at all times during the running and operation of plant and equipment. During this period the Contractor shall ensure proper working of complete plant and equipment and attend any works required to be

done and shall also take complete responsibility for proper operation and maintenance of the complete plant and equipment.

87.0 PAINTING

All exposed concrete and masonry structures shall be painted with approved quality cement paint with a shade approved by the Engineer.

The entire factory manufactured equipment/machineries like motors, pumps, electrical panel, starters, junction boxes, isolators, storage tanks etc. Supplied and installed by the ETP contractor shall be given one coat of paint of approved shade after testing and commissioning irrespective of the condition of original paint of equipment/machineries. All the steel structure, supports and piping etc. fabricated / assembled at site by the contractor shall be given one coat of anti corrosion primer and one coat of approved synthetic enamel paint immediately after fabrication/assembly. After testing and commissioning one more coat of approved synthetic enamel paint for these site fabricated items. Wherever required due to special weather conditions, epoxy / rubberized paint to be provided instead of synthetic enamel paint. All surfaces wherever required must be properly cleaned from scale, dirt and grease prior to painting. Spray painting must preferably be used on all the equipment/machineries and wherever practicable. Suitable and necessary cleaning/wiping of sight/dial glasses, other non-metallic parts, flooring, walls and other surfaces which have been spoiled by paint during painting must also be carried out by the Contractor.

Lettering and other markings, including capacity and flow direction markings, shall also be carried out by the Contractor on the tanks, pipe lines, starters, motors, isolators and wherever else necessary, as directed and as per the standard practice of installation after testing and commissioning. The colour codes and colour charts based on IS 2378- 1963 for the relevant services are given below:

| | <u>Untreated water</u> | <u>Drainage</u> |
|---------------|------------------------|-----------------|
| Application | Raw water line | All drains |
| Ground colour | Sea green Black | |
| Shade no. | As per ISI 217 | |
| First band | White | |

Supply of all paints and all other materials required is included in the scope of supply of the Contractor under this Contract/order.

88.0 TIME FOR COMPLETION

- 88.1 Time of completion shall be as per Section - I Instruction to the bidders clause 1.5. 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 21 hereof, within the time stated in the Contract or such extended time as may be allowed under Clause 90 hereof.

89.0 EXTENSION OF TIME OF COMPLETION

- 89.1 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 OMFED/Owner 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.

90.0 LIQUIDATED DAMAGES FOR DELAY

- 90.1 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 OMFED/Owner the sum at the rate 0.5% (point five percent) of the amended upto date contract value as liquidated damages for such default and not as a penalty for every week or part of the week which shall elapse between the time prescribed by clause 88 hereof and the date of certified completion of the particular Works. The OMFED/Owner 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 Contract. 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.
- 90.2 The aggregate maximum of the liquidated damages payable to the OMFED/Owner under this clause shall be subject to a maximum of 10% of the Contract value.
- 90.3 If, before the completion of the whole of the Works any part or section of the Work has been certified by the Engineer as completed, pursuant to Clause 21 hereof, and occupied by the OMFED/Owner, 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.
- 90.4 The criteria for deriving the liquidate damage shall be the actual value of works executed and the amended time of completion.

Section- II C
PAYMENT TERMS

91.0 TERMS OF PAYMENT

91.1 Payment for mechanical and electrical equipment supply, installation and commissioning:

i) On progress of work:

60% of the mechanical and electrical equipment price components shall be paid on delivery of the Goods at the destination.

ii) On Progressive Erection:

25% of the mechanical and electrical price components shall be paid on the value of the progressive erection work completed for individual components.

iii) On Commissioning:

Remaining 15% after successful commissioning of the entire plant after obtaining necessary statutory approvals and obtaining desired treated effluent parameters as per schedule.

91.2 Payment for Civil and inter connecting piping works:

i) On Progressive Erection:

85% of the civil and interconnecting piping price component of the contract value will be paid on the value of the progressive work based on percentage fixed for each activity as detailed separately and after it is certified by the Engineer.

ii) On Commissioning:

15% of the civil and inter connecting piping price component of the contract value on completion of satisfactory commissioning of the entire plant.

91.3 Payment for testing, commissioning and co-ordination for statutory approvals

- i)** Advance payment – No advance payment shall be done for this portion.
- ii)** 100% payment shall be released after testing, commissioning and obtaining statutory approvals.

91.4 Retention Money

- a.** A retention amount equivalent to 5% of the total Contract value shall be deducted from the RA bills from (i). mechanical and Electrical equipment supply, installation and commissioning and (ii.) Civil and Interconnecting piping works. This amount shall be released within 60 days of settlement of Final Bill.
- b.** If the Contractor so requests, the OMFED/Owner may pay the cumulative amount of retention money to the Contractor upon lodgment with the OMFED/Owner of a Bank Guarantee issued by Nationalized Bank or a foreign bank operating in India, valid till the settlement of final bill plus 60 days. The acceptable form of the bank guarantee shall be strictly as given in Section IX of the Bidding Documents.

- c. No interest shall be paid by the OMFED/Owner to the Contractor for the amount withheld as Retention Money with the OMFED/Owner.

92.0 PAYMENT IN THE EVENT OF FRUSTRATION

- 92.1 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 OMFED/Owner to the Contractor in respect of the work executed shall be the same as that which would have been payable under clause 35 hereof if the Contract had been terminated under the provisions of clause 35 hereof.

93.0 SETTLEMENT OF DISPUTES

- 93.1 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 or decision. There upon the Engineer shall give his written instructions or decision within a period of thirty days of such request.
- 93.2 Upon the receipt of the written instructions or decisions the Contractor shall promptly proceed without delay to comply with such instructions or decisions.
- 93.3 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 OMFED/Owner, which shall offer an opportunity to the Contractor to be heard and to offer an evidence in support of his appeal. The OMFED/Owner shall give a decision within a period of thirty days after the Contractor has given the said evidence in support of his appeal.
- 93.4 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.

94.0 ARBITRATION

- 94.1 All disputes or differences whatsoever which shall at any time arise between the parties hereto on the construction of this agreement or any clause herein contained or any matter in any way connected therewith or the rights, duties, obligations of the parties hereto shall within 3 months of the written notice of such difference(s) being given by one party to the other be finally referred to the adjudication of the Sole Arbitrator to be appointed by the Project Authority/OMFED. The Project Authority/OMFED shall then finalize a panel of three arbitrators and the intimation shall be sent to the Contractor to enable the Contractor to choose and confirm his acceptance to the appointment of one arbitrator from the panel. If the Contractor fails to communicate his selection of the name, within the stipulated period, the Project Authority/ OMFED shall select one arbitrator from the list and appoint him as the sole

arbitrator. If the Project Authority/ OMFED fails to send such a list within thirty days, as stipulated, the Contractor shall send a similar list to the Project Authority/ OMFED within fifteen days. The Project Authority/ OMFED shall then select one arbitrator from the list and appoint him as the sole arbitrator within fifteen days. If the Project Authority/ OMFED fails to do so the Contractor shall communicate to the Project Authority/ OMFED the name of one officer from the panel who shall then be the Sole Arbitrator. The appointment of the Sole Arbitrator so made shall be final and conclusive.

- 94.2 If the Arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another Sole Arbitrator shall be appointed as aforesaid.
- 94.3 The Arbitrator shall be deemed to have entered in the reference on the date he issues notices to both the parties fixing the date of the first hearing.
- 94.4 The Arbitrator from time to time, with the consent of the parties enlarges the time for making and publishing the award.
- 94.5 The venue of the Arbitration shall be Bhubaneswar only and jurisdiction for any matter/ dispute arising out of or concerning or connected with such Arbitration shall be of Bhubaneswar court only as the case may be.
- 94.6 The fees, if any, of the Arbitration shall, if required to be paid before the award is made and published, be paid at half by each of the parties. The costs of the reference and the award including the fees, if any, of the Arbitrator shall be in the discretion of the Arbitrator who may direct to and by whom and in what manner, such costs or any part thereof shall be paid and may fix and settle the amount of costs to be so paid.
- 94.7 The award of the Arbitrator shall be final and binding on both the parties.
- 94.8 The Arbitration proceedings shall be governed under the provision of the Indian Arbitration & Conciliation Act, 1996 and the rules made there under or any statutory modification thereof for the time being in force. Performance under the Contract, shall, if reasonably possible, continue during the Arbitration proceedings and the payments due to the Contractor by the Project Authority/ OMFED shall not be withheld, unless they are the subjects of the Arbitration proceedings.

95.0 NOTICES

- 95.1 All certificates, notices or written orders to be given by the OMFED/Owner or by the Engineer to the contractor under the terms of the contract shall be in writing or by telegram or telex/cable and confirmed in writing to the contractor's principal place of business, or such other address as the contractor shall nominate for this purpose.
- 95.2 All notices to be given to the OMFED/Owner 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 the purpose.

- 95.3 A notice shall be effective when delivered or on the notice's effective date, whichever is later.
- 95.4 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.

96.0 DEFAULT OF OMFED/OWNER

- 96.1 In the event of the OMFED/Owner:
- 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 OMFED/Owner 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 OMFED/Owner 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 OMFED/Owner, with a copy to the Engineer.
- 96.2 Upon the expiry of the fourteen days' notice referred to in clause 96.1, the contractor shall, notwithstanding the provision of clause 25.1 hereof, with all reasonable dispatch, remove from the site all constructional plant brought by him thereon.
- 96.3 In the event of such termination the OMFED/Owner shall be under the obligations to the Contractor in regard to payment arising out of or in connection with or by consequence of such termination, as are deemed reasonable & fair.

97.0 TAXATION

- 97.1 The Contractor shall be entirely responsible for all taxes duties, license fees etc. incurred until delivery of contracted goods including installation and commissioning to the OMFED/Owner.
- 97.2 The Contractor shall be liable to pay all prevailing taxes, duties, work contract tax, turnover tax, income tax and other taxes that shall be levied according to the laws and regulations applicable from time to time in India and the price bid by the Contractor shall include all such taxes. Wherever the laws and regulations require deduction of such taxes at the source of payment, the OMFED/Owner shall effect such deductions from the payment due to the Contractor. The remittance of amounts so deducted and issuance of certificate for such deductions shall be made by the OMFED/Owner as per the laws and regulations in force. Nothing in the Contract shall relieve the Contractor from his responsibility to pay any tax that may be levied in India on income and profits made by the Contractor in respect of the Contract

The Contractor's staff, personnel and labor will be liable to pay personal income taxes in India in respect of their salaries and wages as are chargeable under the laws and regulations for the time being in force, and the Contractor shall perform such

duties in regard to such deductions thereof as may be imposed on him by such laws and regulations.

98.0 BRIBERY AND COLLUSION

- 98.1 The OMFED/Owner 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 OMFED/Owner, 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 OMFED/Owner by one or more Contractors.
- 98.2 In the event of such termination, the Contractor shall:
- a) Proceed as provided in sub clause 35.7 hereof, and
 - b) Be paid by the OMFED/Owner as provided in sub-clause 35.8 hereof, provided that any loss referred herein shall first be deducted.

99.0 TERMINATION OF CONTRACT FOR OMFED/OWNER'S CONVENIENCE

- 99.1 The OMFED/Owner 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.
- 99.2 In the event of such termination the Contractor:
- a) Shall proceed as provided in sub clause 35.7 hereof, and
 - b) Shall be paid by the OMFED/Owner as provided in sub clause 35.8 hereof.

100.0 PRICES

- 100.1 Prices charged by the Contractor for goods delivered and services performed under the Contract shall not, , vary from the prices quoted by the Contractor in his bid.

101.0 DELAY IN CONTRACTOR'S PERFORMANCE

- 101.1 Delivery of the Goods and performance of Service shall be made by the Contractor in accordance with the time schedule specified by the OMFED/Owner in his Schedule of Requirements.
- 101.2 An unexcused delay by the Contractor in the performance of his delivery obligations shall render the contractor liable to any or all of the following sanctions/forfeiture of his performance security, imposition of liquidated damages, and/or termination of the Contract for default.
- 101.3 If at any time during the performance of the Contract, the Contractor or his sub-contractor(s) should encounter conditions impeding timely delivery of Goods and performance of Services, the Contractor shall promptly notify the OMFED/Owner in

writing of the fact of the delay, its likely duration and its cause(s), as soon as practicable after the receipt of the contractor's notice the OMFED/Owner shall evaluate the situation and may at its discretion extend the Contractor's time for performance, in which case the extension shall be ratified by the parties by amendment of the Contract.

102.0 TERMINATION FOR DEFAULT

102.1 The OMFED/Owner may, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Contractor, terminate the contract in whole or part:

(a) If the Contractor fails to deliver any or all of the Goods within the period(s) specified in the Contract, or any extension thereof granted by the OMFED/Owner pursuant to Clause 101.0; or

(b) If the Contractor fails to perform any other obligations(s) under the Contract.

102.2 In the event the OMFED/Owner terminates the Contract in whole or part, pursuant to Para 102.1, the OMFED/Owner may procure, upon such terms and in such manner, as it deems appropriate, Goods similar to those undelivered, and the Contractor shall be liable to the OMFED/Owner for any excess costs for similar Goods. However, the Contractor shall continue performance of the Contract to the extent not terminated.

102.3 Consequent to such termination of Contract, the OMFED/Owner shall recover the advance paid, if any, to the contractor along with interest @ 18% per annum compounded quarterly on the last day of March, June, September and December on the advance paid for the entire period for which the advance was retained by the Contractor.

103.0 FORCE MAJEURE

103.1 Notwithstanding the provision of Clauses 91, 101 & 102 the contractor shall not be liable for forfeiture of his performance security, liquidated damages or termination for default, if and to the extent that, his delay in performance or other failure to perform his obligations under the Contract is the result of an event of Force Majeure.

103.2 For any purposes of this clause, "Force Majeure" means an event beyond the control of the Contractor and not involving the Contractor's fault or negligence and not foreseeable. Such events may include, but are not restricted to, acts of the OMFED/Owner either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.

103.3 If a Force Majeure situation arises, the Contractor shall promptly notify the OMFED/Owner in writing of such conditions and the cause thereof. Unless otherwise directed by the OMFED/Owner in writing, the Contractor shall continue to perform his obligations under the contract as far as it is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

103.4 In the event of Force Majeure continues for a period of 6 months, all the parties shall discuss regarding mutually agreed line of action & discuss the performance of the contract.

104.0 CHANGE ORDERS

104.1 The OMFED/Owner may, at any time, by a written order given to the Contractor pursuant to Clause 95, make changes within the general scope of the Contractor in any more of the following:

- a. Drawings, designs or specifications, where Goods to be furnished under the Contract are to be specifically manufactured by the OMFED/Owner:
- b. The method of shipment or packing;
- c. The place of delivery; or
- d. The Services to be provided by the Contractor,

104.2 If any such change causes an increase or decrease in the cost of, or the time required for the Contractor's performance of any part of the work under the contract, whether changed or not changed by the order, an equitable adjustment shall be made in the contract price or delivery schedule. Or both, and the contract shall accordingly be amended. Any claims by the contractor for adjustment under this clause must be asserted within thirty (30) days from the date of the contractor's receipt of the OMFED's/Owner's change orders.

105.0 JURISDICTION:

For the settlement of any disputes arising out of the contract against this bid, only the court at Bhubaneswar (Orissa) shall have jurisdiction.

SECTION – II D

SPECIAL CONDITION OF CONTRACT

1.0 SPECIAL CONDITION OF CONTRACT

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 rates shall include all taxes. The bidder shall include in his rates all types of taxes including GST, Royalties, labourcess etc. as per the law of the Central & the Government of the state, where the Contract is to be performed. No claim on account of any type of tax shall be admissible.

3.0 STORE

- 3.1 The Contractor shall at his own cost provide a temporary material store of suitable size for storing the materials to be used by him during the work and shall provide electrical connection to the same. The structure shall be removed after the completion of work, by the Contractor, at his own cost.

4.0 WATER FOR CONSTRUCTION AND OTHER USE

- 4.1 Unless otherwise specified the Contractor shall make his own arrangement for water for the work and nothing extra shall be paid for the same.
- 4.2 The water used by the Contractor shall be fit for drinking as well as construction purposes to the satisfaction of the OMFED/OWNER.
- 4.3 The Contractor may be allowed to construct temporary tube wells/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.
- 4.4 In case the Owner/Purchaser supplies water, it shall be on the following conditions:
1. **Water charges @0.5% shall be recovered from the gross amount of work done from each Interim bill.**
 2. The water shall be provided at one point in the site at the discretion of the Engineer. The Contractor shall make his own arrangement for water connection and distribution pipelines in the construction area.

3. The Owner/Purchaser 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.

5.0 POWER (ELECTRICITY) SUPPLY

- 5.1 Unless otherwise specified the Contractor shall have to make his own arrangements for the power supply at his cost. All the works shall be done as per IEA 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.
- 5.2 In case the power supply is provided by the Owner/Purchaser, it shall be on the following conditions:-
 1. Electricity charges @ 0.5% shall be recovered from the gross amount of work done from each interim 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 IEA rules.
 3. The 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.

6.0 TEMPORARY WORKS

- 6.1 All temporary sheds, godowns, office etc required for storage/safe custody of materials and for contractor's supervisory personnel at site shall be accounted for in the bid prices.

7.0 CHEMICALS AND LUBRICANTS

- 7.1 All chemicals, nutrients and first fill of lubricants for equipment as necessary for commissioning and test run of the plant shall be provided by the contractor.

8.0 INCIDENTAL WORKS AND SERVICES

- 8.1 All works necessary and incidental for the satisfactory completion of the plant shall be included in the scope of the work.

- 8.2 The incidental services shall be provided as per the requirement outlined in the Schedule of Specifications and as covered under Clause 42 of the General Conditions of Contract.

9.0 ACCESS TO THE UNITS

- 9.1 Platforms, ladders, walkways and railings for the safe and easy access to the units shall be provided.
- 9.2 CI rungs shall be provided for safe and easy maintenance of all chambers, manholes and plant units.

10.0 TEST- RUN OF THE PLANT

- 10.1 After stabilization of 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. Over and above the daily monitoring of effluent quality by the Contractor, he shall arrange at his own cost, analysis of the composite raw and treated effluent samples for 7 consecutive days at an external laboratory approved by the State Pollution Control Board. The results shall conform to the performance guarantee for the plant, which shall be a pre requisite for the take over 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.

11.0 LESS EFFLUENT FLOW CONDITION

- 11.1 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 without extra cost to the OMFED/Owner.

12.0 TRAINING

- 12.1 The Contractor shall train the plant personnel in the Operation & Maintenance practice for the Effluent Treatment Plant during the one-month guarantee test run.

13.0 OPERATION MANUAL

- 13.1 The scope of services shall include the Preparation and Submission of Operation & Maintenance Manual prior to plant commissioning. The Manual shall cover the following aspects:

Brief process description & flow sheet. Unit-wise function and description Equipment details, operational instructions, maintenance procedures. Plant start-up, commissioning, normal operation, and emergency operation steps.

14.0 INSURANCE

The insurance shall be for an amount equal to 110% value of the Goods & services including installation/ commissioning on "All Risks" basis including War risks and Strike clauses valid for a period not less than 3 months after the date of handing over.

15.0 SPARE PARTS

The contractor shall carry sufficient inventories to assure ex-stock supply of consumable spares such as gaskets, plugs, washers, belts etc. Other spare parts and components shall be supplied as promptly as possible but in any case within one month of placement of order.

16.0 NOTICES

For the purpose of all the notices, the following shall be the address:

**MANAGING DIRECTOR
THE ORISSA STATE CO-OPERATIVE MILK
PRODUCERS' FEDERATION LIMITED,
D- 2, SAHID NAGAR, BHUBANESWAR
PIN – 751 007.**

SECTION – III

GENERAL TECHNICAL SPECIFICATIONS & DESIGN DATA TABLES

1.0 BACKGROUND

The Luakera, Rourkela OMFED Dairy Plant has installed raw milk handling capacity of 30 KLD, and the plant is currently handling 27 KLD milk + 3 KLD product (around 100% of the installed capacity utilisation). The water intensive operations at the plant generates around 25 KLD of waste water from the milk processing facility complex which is treated at the Effluent Treatment Plant inside the facility.

This report addresses the cause, effect and remedial measures with waste water (effluent) that is generated from a milk processing facility complex.

1.1 EXISTING STRUCTURES AND PROCESS

The treatment scheme as per the manual for the ETP plant consists of the following units:

Screen Chamber → Collection Chamber → Fat Removal Tank → Equalisation Tank1 → Equalisation Tank2 → Aeration Tank-1 → Secondary Settling Tank-1 → Aeration Tank-2 → Secondary Settling Tank-2 → Sludge Drying beds

The existing ETP facility isn't handling the generated effluent adequately due to both equipment, structural, maintenance constraints as well as process issues. This necessitated to make modifications to the existing structures as well as processes to handle the effluent efficiently while adhering to the OSPCB recommended standards.



1.3 BASIS OF DESIGN

The proposed Effluent Treatment Plant (ETP) has been designed to treat 30 KL/Day Effluent discharge from dairy waste to prescribed outlet standards. This existing ETP renovation proposal is for design, construction, installation and commissioning of the system on turnkey basis. The proposed ETP is designed to treat effluent with following characteristics: ETP 25 KLD

Operating Hours : 20 Mode of Operation : Semi-Automatic

Table 1.1 : Expected Design Characteristics of Untreated Effluent

| Sr. No. | Parameter | UOM | Concentration | OPCB Limit |
|---------|---------------------------------|-----------|---------------|------------|
| 1 | Flow | cu.m/day | 30 | |
| 2 | Average flow rate | cu.m/hr | 1.25 | |
| 3 | Peak flowrate | cu.m/hr | 2 | |
| 4 | pH | | 6 – 10 | 6.5 - 9 |
| 5 | Total Dissolved Solids | mg./litre | < 2100 | < 2200 |
| 6 | Total Suspended Solids | mg/litre | 900 | < 100 |
| 7 | Biochemical Oxygen Demand (BOD) | mg/litre | 1750 | < 30 |
| 8 | Chemical Oxygen Demand (COD) | mg/litre | 4450 | < 250 |
| 9 | Oil & Grease | mg/litre | 350 | < 10 |

Table 1.2 : Desired Design Characteristics for Treated Effluent

| Sr. No. | Parameter | UOM | Concentration | OPCB Limit |
|---------|---------------------------------|----------|---------------|------------|
| 1 | Flow, | cu.m/day | 30 | |
| 2 | Average flow rate | cu.m/hr | 1.25 | |
| 3. | Peak flow rate | cu.m/hr. | 2.0 | |
| 4 | pH | | 6.5 – 8.5 | 6.5 - 9 |
| 5 | Total Dissolved Solids | mg/litre | <2100 | < 2200 |
| 6 | Total Suspended Solids | mg/litre | < 100 | < 100 |
| 7 | Biochemical Oxygen Demand (BOD) | mg/litre | < 30 | < 30 |
| 8 | Chemical Oxygen Demand (COD) | mg/litre | <250 | < 250 |
| 9 | Oil & Grease | mg/litre | < 10 | < 10 |

Note:

All parameters from 4 to 9 (Table 2) shall conform to Odisha State Pollution Control Board norms for the project / plant.

DESCRIPTION OF WASTEWATER: Classification of various waste water

| Type | Category | Description |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 1 | Amount of milk processed | 30 KLD |
| 2 | <p>Expected sources of waste water: wastewater from the production line (CIP: cleaning of equipment and pipes) cooling water, domestic wastewater, the acid whey and sweet (Paneer processing, Floor cleaning, Crate washing etc.)</p> <p>N.B:</p> <p>1. Majority of the wastewater gets produced during cleaning operations, especially between product</p> <p>2. The wastewaters discharged from the plant contain high concentrations of nutrients, chemical oxygen demand (COD), biological oxygen demand (BOD), total suspended solids (TSS) and organic and inorganic contents, which can cause serious environmental problems if not properly treated</p> | |
| | Total | 25 KLD |
| | Size of plant | 30 KLD |

2.0 TREATMENT (STAGES & TECHNOLOGY): The basis of choice for treatment methodology

| Stepwise process | Details | How Special |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Screening | To remove all the macroparticles, plastics, etc | A self-cleaning screendesign, it won't choke |
| Nanobubble Filtration | <p>Here Ozone is used to disinfect and neutralize micro-organism</p> <p>And Bubbles are used to remove organics, proteins, Oil, fats, to reach sludge beds</p> <p>Ozone also breaks oil grease</p> | <p>Disinfection a first stage makes water safe, not disease causing, kills all virus, bacteria, pathogens, and removes from water</p> <p>Ozone is freely generated and no use of chemicals</p> |
| Stripper | Stripper removes all gases chiefly ammonia | |
| Nanobubble Aeration | The presence of nitrates and phosphates, are oxidized with aeration | Consumes 80% less power compared to normal aeration |
| Wetland system | It will naturally take up nutrients by specialized plants | Purely natural way to clean |
| Tertiary Nanobubble Filtration | It disinfects with ozone, cleans, removes bacteria from plants and cleans water | Disinfection in last stage before discharge |

The Process Flow Diagram

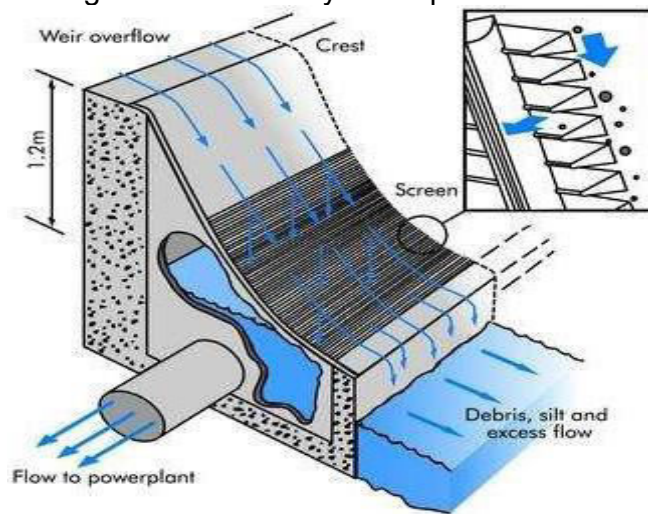


3.0 How do they work?

3.1 Self-cleaning Screen

This screen works on 2 pass principle. Water does not jam on screen, it pushes the particles away from it. This allows self cleaning. This ensures we can have finer screens to filter better. The more the meat particles we remove, lesser is our problem of trying to separate them in the ETP.

The waste water passes through a screen to remove all large objects like polythene, paper, sticks etc. carried in the waste water stream. This is most commonly done with a self-cleaning bar screen working on the coanda principle. The solids are collected and later disposed in a landfill, or incinerated. Bar screens or mesh screens of varying sizes may be used to optimize solids removal. If gross solids are not removed, they become entrained in pipes and moving parts of the treatment plant, and can cause substantial damage and inefficiency in the process.



3.2 Nano Bubble Filtration Stage I

These filters generate Nano Bubbles which are charged. They lock on to dissolved, surfactants, retention aids, fiber and remove them from water, with or without the help of surfactants in very low doses.



In this stage, further carrying away of **fines** is prevented. The Nano Bubbles being charged help in coalescence of the impurities and this helps in removal and load reduction by removing them in form of foam. There is no membrane, no maintenance it is use of aeration for skimming. The resulting water is free of most of the organic load. Free of fats and milk proteins. The Nano Bubbles being charged also demulsify milk solids from water.

3.3 Stripping

Technology used Vacuum Induced Stripper Mechanism

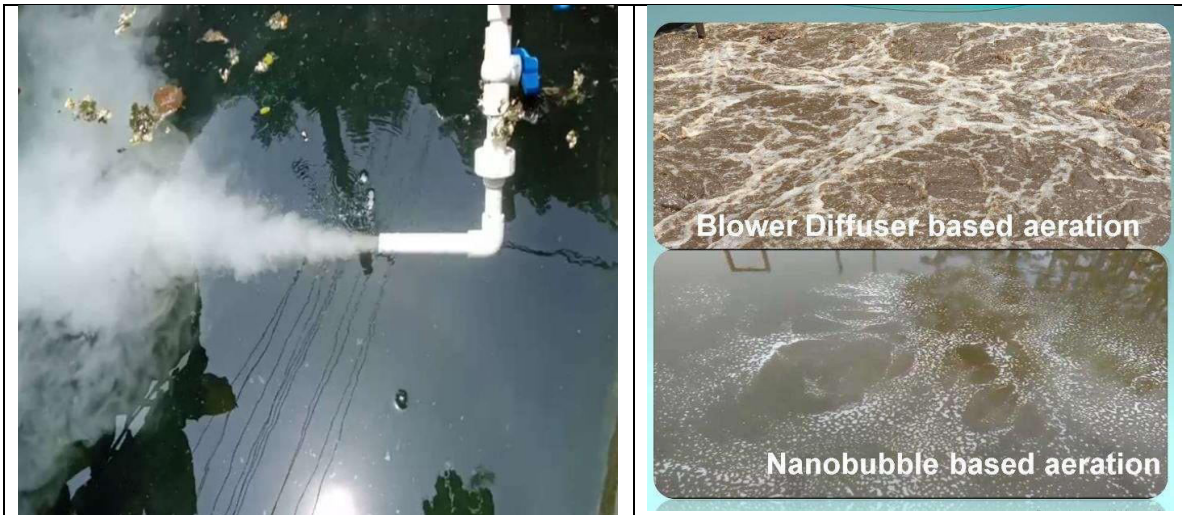
These strippers use induced vacuum to remove **ammonia**, **volatiles** and **gases**. The advantage is zero chemicals required and removal of ammonia helps in decreasing nitrate formation in the biological system further downstream.



3.4 Facultative Bio-degradation Tank

Nano Bubble Aeration (vs Blower based aeration)

The aeration system incorporates Nano Bubble aerators for oxidation of compounds and help in bio degradation of organic compounds.



The cost reduction is ~80% in power consumed



NoPipes

Works at 5-6 meters depth SWOT Consulting & Management Page 10 of 22

3.5 Nano Bubble Filtration Stage II

These filters generate Nano Bubbles which are charged. They lock on to the dissolved, surfactants, retention aids, fibers, etc and remove them from water, with or without the help of surfactants in very low doses.



In this stage, further carrying away of **bio growth** with water is prevented. The Nano Bubbles being charged help in coalescence of the impurities and this helps in removal and load reduction by removing them in form of foam. There is no membrane, no maintenance. It is use of aeration for flotation. The resulting water is free of most of the organic load.etc.

These filters generate Nano Bubbles which are charged. They lock on to dissolved, surfactants, emulsions proteins and remove them from water, with the help of de-emulsifying surfactants in very low doses.

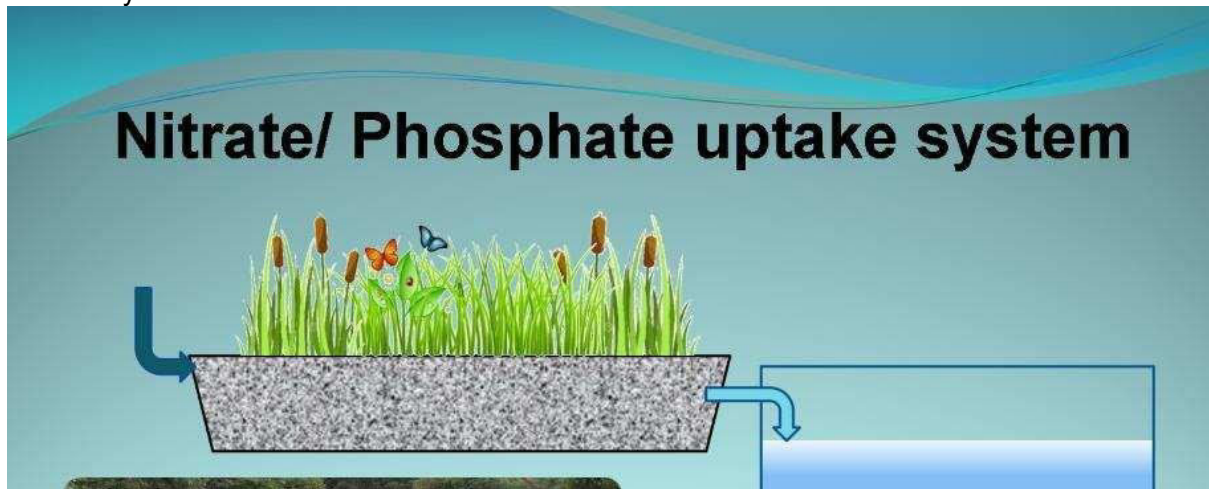
In this stage, further carrying away of organics is prevented. The Nano Bubbles being charged help in coalescence of the impurities and this helps in removal and load reduction by removing them in the form of foam. There is no membrane, no maintenance it is use of aeration for skimming. The resulting water is free of most of the organic load.

Note: This schedule indicates the minimum requirement of the pipe and valve segments for the plant. However, in case, any additional piping is felt essential during the bidding/work execution to complete the ETP works, the same shall be provided by the Contractor without any extra cost. OD implies outer diameter of the pipe wherever specified. HDPE Sr II implies 4.0 kg/sq.cm pressure rating pipes HDPE Sr III implies 6.0 kg/sq.cm pressure rating pipes.



3.6 Nutrient Uptake System

It works as tertiary filtration, nutrient uptake natural organic system, without use of chemicals and machinery



It works as tertiary filtration
nutrient uptake natural
organic system, without use
of chemicals and
machinery.

4.0 Specification of Equipment

4.1 Ozone injection system

Ozone is injected to kill bacteria in tertiary stage Ozone has a very high oxidation potential. Ozone does not form organochlorine compounds, nor does it remain in the water after treatment. Ozone is a cost-effective method of treating water, since it is produced on demand and does not require transportation and storage of hazardous chemicals. Once it has decayed, it leaves no taste or odour in water.



Ozone is injected to kill bacteria in tertiary stage Ozone has a very high oxidation potential. Ozone does not form organochlorine compounds, nor does it remain in the water after treatment. Ozone is a cost-effective method of treating water, since it is produced on demand and does not require transportation and storage of hazardous chemicals. Once it has decayed, it leaves no taste or odour in water.

4.2 Oxygen Generator plant

Oxygen concentrator uses PSA technology and makes oxygen from air. Now combined with the efficiency of gas mixing in nano-bubble form, instead of air, increases the efficiency of aeration 500% and ozone production also.

This is an efficient way of decreasing energy consumption and achieving disinfection without use of any oxidant



Oxygen concentrator uses PSA technology and makes oxygen from air. Now combined with the efficiency of gas mixing in nanobubble form, instead of air, increases the efficiency of aeration 500% and ozone production also.

This is an efficient way of decreasing energy consumption and achieving disinfection without use of any oxidant chemicals.

5.0 Basis of Design (Typical Dairy Plant ETP)

Note:All parameters from 4 to 9 (Table 1.2) shall conform to Odisha State Pollution Control Board norms for the project / plant.

5.1 Typical Dairy Plant ETP Process Flow Description:

| | |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bar Screen | The wastewater coming to the plant is mainly generated through the Dairy Unit. This contains Fats, oil, sand and debris etc. This water is initially fed to a bar screen. The larger impurities like plastics are trapped in the bar screen. |
| Equalization Tank | The wastewater from the Screening is collected in the Equalization Tank to homogenize the Effluent parameters then it is pumped to further process. |
| Coagulation Tank | Water from collection tank will enter into Coagulation Chamber where coagulant agent will be added for chemical reaction to produce the macro flocks. |
| Flocculation Tank | Water from Coagulation Chamber will enter into Flocculation Zone where Flocculent agent & poly dosing will be added to produce the micro floccs that will make sludge separation easy. |
| Primary Tube Settler | Water then is fed to the specially design settler which is called Tube settler. The sludge flocks settles in the conical bottom and the clear liquid overflows from the top of the tube settler. The clear liquid from the tube settler enters into the chlorine contact tank |
| Tertiary Feed Tank | Water gets stored here and This tank also provides feed for tertiary treatment. |
| Multi-grade Filter | Water From the chlorine contact tank it is pumped to the Multi grade sand Filter and Activated Carbon filter for the final filtration. The multi-grade filter is used to remove the total suspended solids, dirt, iron and reduce silt and to provide TSS free water |
| Activated Carbon Filter | The ACF (Activated Carbon Filter) is used to further polish the water and to remove the total color, smell, odor, from the water. |
| Sludge Handling Unit | Slurry from Tube settler tank will be pumped to sludge drying bed which will be filled with sand media which separates heavy sludge particle from the slurry and the supernatant will be flowed to Equalization tank through gravity. In large capacity plant slurry will be pumped to sludge holding tank to further thicken it, then it will be feed to centrifuge/filter press through screw pump to separate water from slurry to make sludge in dry cake form. |

5.2 Electro-Mechanical Equipments

| SN | | Item | Specification | Unit | Quantity | |
|-------------------------|------------------------------------------------|-----------------|-------------------------|------|-----------|--|
| A Mechanical Equipments | | | | | | |
| 1.0 | Bar Screen | Size | 250 x 250 | Each | 1 | |
| | | MOC | MS | | | |
| 2.0 | Raw Sewage Transfer Pumps for Equalization | Type | Submersible | Each | 1 working | |
| | | Flow | 1.25 m3/hr | | | |
| | | Head | 8-10 meter | | | |
| | | Solid Handling | 32 mm | | | |
| | | MOC | CI | | | |
| | | Voltage | 415 ± 6% 50 Hz | | | |
| 3.0 | Coagulation Tank | Volume | 0.45 M3 | No. | 1 | |
| | | MOC | MSEP | | | |
| 4.0 | Flocculation Tank | Volume | 0.45 M3 | No. | 1 | |
| | | MOC | MSEP | | | |
| 5.0 | Primary Settling tank | Surface Area | 0.5 M2 | No. | 1 | |
| | | MOC | MSEP | | | |
| 6.0 | Clarified Water Tank | Volume | 1.8 M3 | No. | 1 | |
| | | MOC | MSEP | | | |
| 7.0 | Twin Lobe Air Blower | Flow | 30.0 m3/hr | Each | 1 working | |
| | | Head | 0.4 kg/cm2 | | | |
| | | MOC | CI | | | |
| | | RPM | 1500 | | | |
| 7.1 | Blower Header & Inter connecting Piping to EQT | Header | GI Pipe | Lot | 1 | |
| | | Sub Header | GI Pipe | | | |
| | | Valves | Ball/Butter Type | | | |
| 7.2 | Air Diffusers for EQT | Type | Disc | Lot | 1 | |
| | | Bubble | Coarse | | | |
| | | MOC | EPDM | | | |
| | | Air Flow | 4-6 m3/diffuser | | | |
| 7.3 | Instruments Air | Safety Valve | 2 No | Lot | 1 | |
| | | Pressure Gauge | 1 Lot | | | |
| 8.0 | Tube Settler Media | Size | 750 mm | Lot | 1 | |
| | | Color | Black | | | |
| | | MOC | PVC | | | |
| | | Structure | V type | | | |
| 9.0 | MBBR Media | Shape | Trapezoidal Cylindrical | Lot | 1 | |
| | | Specific weight | 0.47 kg/m2 | | | |
| | | Density | 0.93 gm/cc | | | |
| 10.0 | Sludge Transfer Pump | Capacity | 0.25 m3/hr | Each | 1 working | |
| | | MOC | CI | | | |
| | | Filter Media | PP/ Polyester | | | |
| | | Handling | Manual | | | |

| | | | | | |
|-------------|---------------------------------------------|---------------------|-------------------------------------|------|-----------|
| 11.0 | Alum, Lime & Poly Dosing Systems | | | | |
| 12.1 | Dosing Pump | Capacity | 0-6 LPH | Each | 3 |
| | | Type | Diaphragm | | |
| 12.2 | Dosing Tank | Capacity | 50 Liters | Each | 3 |
| | | MOC | HDPE | | |
| 13.0 | Chlorine Dosing Systems | | | | |
| 13.1 | Dosing Pump | Capacity | 0-4 LPH | Each | 1 |
| | | Type | Diaphragm | | |
| 13.2 | Dosing Tank | Capacity | 50 Liters | Each | 1 |
| | | MOC | HDPE | | |
| 14.0 | Agitators for Reaction Tanks | MOC | MSEP | Each | 2 |
| 15.0 | Filter Feed Pump | Type | Horizontal Centrifugal | Each | 1 working |
| | | Flow | 0.75 m ³ /hr | | |
| | | Head | 20-25 meter | | |
| | | MOC | CI | | |
| 16.0 | Multi-grade filter | | | | |
| 16.1 | Pressure Vessel | MOC | FRP | Each | 1 |
| | | Diameter | 13 Inches | | |
| | | HOS | 54 Inches | | |
| | | Opening | Top | | |
| | | Working Pressure | 3.0 kg/cm ² | | |
| | | Filtration Velocity | 16 m ³ /h/m ² | | |
| 16.2 | Valve | Type | Multiport | Each | 1 |
| | | Size | 15 mm | | |
| 16.3 | Media | Gravels | -700 mm- | Lot | 1 |
| | | Pebbles | | | |
| | | Quartz Sand | | | |
| | | Bed depth | | | |
| 16.4 | Header Pipeline & Flange | MOC | uPVC | Lot | 1 |
| | | Test Pressure | 10 kg/cm ² | | |
| 16.5 | Pressure Gauges | Range | 0-7 bar | Each | 1 |
| | | Dial Size | 2 inches | | |
| | | Type | Bourdon | | |
| 17.0 | Activated Carbon Filter | | | | |
| 17.1 | Pressure Vessel | MOC | FRP | Each | 1 |
| | | Diameter | 13 Inches | | |
| | | HOS | 54 Inches | | |
| | | Opening | Top | | |
| | | Working Pressure | 3.0 kg/cm ² | | |
| | | Filtration Velocity | 15m ³ /h/m ² | | |
| 17.2 | Valve | Type | Multiport | Each | 1 |
| | | Size | 15 mm | | |
| 17.3 | Media | Activated | -700 mm- | Lot | 1 |

| | | | | | |
|-------------|-------------------------------------|---------------------------------------------------------------------|------------|------|---|
| | | Carbon | | | |
| | | Pebbles | | | |
| | | Gravels | | | |
| | | Bed depth | | | |
| 17.4 | Header Pipeline & Flange | MOC | uPVC | Lot | 1 |
| | | Test Pressure | 10 kg/cm2 | | |
| 18.0 | Pressure Gauges | Range | 0-7 bar | Each | 1 |
| | | Dial Size | 2 inches | | |
| | | Type | Bourdon | | |
| 19.0 | Inter Connecting Piping | MOC | uPVC | Lot | 1 |
| | | Test Pressure | 10 kg/cm2 | | |
| 20.0 | Electrical Control Panel | Complete Starters, Overload relays, Single Phase preventer for pump | | Set | 1 |
| | | Voltmeter, Ammeter, MCB's , indicating lights | | | |
| | | Push Buttons | | | |
| | | Rocker Switches for Dozers | | | |
| | | Incomers, Auto-Manual Switches | | | |
| 21.0 | Wiring & Cable tray | Suitable as per requirement | Lot | 1 | |
| 22.0 | Control Equipment | Flow meter | -Suitable- | Lot | 1 |
| | | pH Meter | | | |
| | | Level Switches | | | |

5.3 List of Civil Works

1. Bar Screen Chamber 1 No.

Size 0.6 x 0.6 x 1.0 meters (RCC) 1 no

2. Oil & grease Tank 1 No.

Capacity 0.25 m³ 1 no

3. Equalization Tank 1 No.

Capacity 8.0 m³ 1 no

4. Sludge Drying Beds 1 No.

Capacity 1 m³ (RCC) 1 no

5. Plant Room, Foundation for equipments, shed etc. 1 Lot

Size 0.6 x 0.6 x 1.0 meters (RCC) 1 lot

EXISTING FACILITY & PLANNED MODIFICATIONS AT LUAKERA PLANT: Units and Dimensions

| Sl. No. | Unit | No. | Size, type and material of construction |
|---------|-----------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Raw Effluent Collection Sump | | Available at site (modification to be made if required) |
| 2. | Reaction tank | 1 | 1.5 x 1.5 x 2.0M (new construction if required) |
| 3. | ANF Buffer tank cum feed tank | 1 | Existing collection tank shall be used (modification to be made if required) |
| 4 | USAB Digester | 1 | 2.6.0 M DIA X 6.0 M LIQUID DEPTH, MS epoxy coated (new construction if required) |
| 5 | Secondary Clarifier | 1 | 1.8 x2.4 M x2.5m liquid depth, MS epoxy coated (new construction if required) |
| 6. | Filter Room | 1 | ROOM not required, outdoor unit shall be provided (modification to be made if required) |
| 7. | Gas Holder Tank with accessories etc. | 1 | not required, open to air gas shall be arranged (modification to be made if required) |
| 8 | Treated Effluent Collection Tank | 1 | Existing RCC tank shall be used (modification to be made if required) |
| 9. | Treated Water Disposal Pump Pad | 1 | 1.0 m x 1.0 m in RCC M20 (new construction if required) |
| 10. | Interconnecting path way / steps / stair for the entire plant including lighting. | 01 lot | 1.Existing shall be used (modification to be made if required). 2. for ANF prefab ladder to be provided (new construction required) |
| 11. | Foundation pads for pumps, blowers, filter, decanter and other mechanical items | 1 lot | As per Manufacturer's Specification (new construction if required) |

EQUIPMENT SPECIFICATIONS (Both Retrofitting as well as Additions)

| Sl. No. | Equipment | No. | Rating and capacity |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Flash Mixer | 1 | To fit into Flash Mixing Tanks MOS: SS316 and Speed 70-80 RPM |
| 2. | Mixers for Chemical Tanks | 2 | To fit into 1000L Chemical Dosing Tanks MOS: SS316 and Speed 70-80 RPM |
| 3. | Chemical Dosing System for pH correction | 2+2 | 220 LPH @3.5 kg/cm ² |
| 4. | Automatic Chemical dosing system constituting of PH sensor, analyser & associated controls | 1 lot | As per process design requirements. |
| 5. | UASB Feed Pumps | 1+1 | Capacity: 1.5 -2.0 m ³ /hr @ 20 MWC Head, CI, Horizontal, Centrifugal, Nonclog semi open impeller, self – priming pump. |
| 6. | Bottom effluent grid in HDPE pipes, nozzles, Attached media, Settler arrangement with overflow launders gas dome, safety devices suitable for USAB | 1 lot | As per process design requirements. |
| 7. | Air Blower for Aeration Tank | 1+1 | Capacity 150 m ³ /hr @ MWC |
| 8. | Fine Bubble Tube diffuser | 1 lot | As per process design requirements |
| 9. | Secondary clarifier mechanism | 1 | Prefab tube setter mechanism in MSEP. |
| 10. | V-Notch Plate | 1 | As per process design requirements in SS-304 |
| 11. | Filter Feed Pumps | 1+1 | Capacity: 1.5-2.0 m ³ /hr @ 25-30 MWC Head, CI, Horizontal, Cetrifugal, non-clog semi-open impeller, self priming pump. |
| 12. | Multi Media Filter | 1 | MMF (Multi Media Filter) in CPA (Composite Poly Amide) Pressure Vessel size 30"x72x' of 10 Kg/cm ² as DP (design pressure) with base frame, frontal Pipe work, White Multi port valve (imported) with different grades of media line pebbles, coarse silex, anthracite, grades & washed quartz sand etc. |
| 13. | Final Treated Effluent Disposal pumps | 1+1 | As per process requirement |

| | | | |
|-----|---------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14. | Screw Press Feed Pumps | 1+1 | As per process requirement. |
| 15. | Screw Press | 1 | As per process requirement |
| 16. | Flow measurement and integration instrument | 2.0 | To measure and totalize 10-20 m ³ /hr flow at inlet and outlet of ETP and at UASB feed and Return line suitable flow meter shall be installed. |
| 17. | Pressure Gauges | 1 lot | Glycerine filled Dial Type fitted at discharge of each pump, filter and necessary location. |
| 18. | Motor control center | 01 | For receiving and distributing LT power |
| 19. | Power and control cables | 1 lot | for connecting MCC with all motors and controls |
| 20. | Earthing system, isolators/PB station etc. | 1 lot | For safety and operation |
| 21. | Lighting DB | 1 no. | For Effluent Treatment Plant Lighting |
| 22. | Interconnecting Piping | 1 Lot | MS/GI -b class / HDPE 63 Grade, 4/6 KGS/Sq. cm, pressure rating of suitable sizes will be provided. As per the detail design and specification for completion and hand over of ETP. |
| 23. | Piping schedule | | As per process requirement. |
| 24. | Valve & fittings | | As per process requirement. |

Note: This schedule indicates the minimum requirement of the pipe and valve segments for the plant. However, in case, any additional piping is felt essential during the bidding/ work execution to complete the ETP works, the same shall be provided by the Contractor without any extra cost. OD implies outer diameter of the pipe wherever specified. HDPE Sr II implies 4.0 kg/sq.cm pressure rating pipes HDPE Sr III implies 6.0 kg/sq.cm pressure rating pipes. Sr stand for Scheduled.

TECHNICAL SPECIFICATION

3.0 UNITS AND EQUIPMENT

3.1 Civil Work

The various units required for the proposed effluent treatment plant with the description of civil work and type of treatment required are as described hereunder:

3.1.1 Inlet channel & Screen Chamber

Existing structure shall be used.

3.1.2 Raw Effluent Collection sump

Existing structure shall be used.

3.1.3 Fat Removal unit

Existing structure shall be used.

3.1.4 Flash Mixer & Chemical Tanks

The tanks shall be constructed in MS with epoxy coat. The flash mixer tank is provided to dose the required quantity of Alkali/ Acid to the raw effluent for pH correction. It shall have inlet and outlet arrangements. Two nos. chemical tanks (Alkali & Acid) in HDPE of required size/ capacity with mixers is to be provided .Necessary cut-outs, insert plates etc. shall be provided.

This unit is completely above Ground level with a drain. Inspection platform in MS is to be provided all around the Flash mixer and dosing tanks assembly with suitable approach stairs.

3.1.5 UASB Feed Tank

Existing collection tank shall be used

3.1.6 Misc. Machine foundation for Pump pads / Air blowers. etc.

The pump pad shall be provided of size as required for installing the raw effluent and sludge pumps / Air blowers / equipment. The pads / pedestals shall be constructed in RCC M 20 with necessary excavation, PCC 1:4:8 base 100 mm thick extending on all the sides etc. complete. Anchor bolts, shall be provided as per the manufacturers requirement.

The machine foundations is to be provided for air blowers, as per manufacturer's requirement along with suitable closed enclosure with roof in civil construction.

3.1.7 MCC, Operator cum Lab room

The existing MCC, Operator room shall be upgraded as per requirement of said upgradation ETP.

3.1.8 UASB digester

UASB shall be provided in MS epoxy structure.

The tank shall be provided with inlet distribution pipe lines in SS-304 with valves & Header pipe (Flushable system) extending to the tank bottom with suitable type and number of diffuser/orifices to evenly distribute the effluent. The bottom grid should be properly anchored to the tank base. UASB shall be provided with the Settler arrangement (Baffles) with a settling zone having tube deck settler for the three phase separation with suitable corrosion resistance treatment on inside as per tender specification for all metallic parts. An outlet weir shall be constructed along with an additional baffle in MSEP/RCC construction to collect the anaerobically treated effluent but to prevent the collection of any flocculent sludge coming with the liquid. The gas collection system shall include the header, a flame arrestor and a pressure relief valve at the digester top.

Necessary arrangement for access into the digester shall be included. At minimum three locations, sludge outlets connected to a common sludge line for sampling/excess sludge disposal to existing drying beds shall be used.

The detailed process design, specs along with layout of distribution grid, Settler arrangement for efficient GLSS system is to be done by the contractor for achieving the desired organic removal of min. 60%. Special care has to be taken while designing various units of the ETP in order to avoid any odor problem. The UASB digester should be fully/partial covered tank with provision at the top for maintenance of the launders /settler plates & accessories. The UASB design should eliminate the possibility of any objectionable odor problem.

3.1.11 Aeration Tank

Existing tank to be modified / used

3.1.12 Clarifier

New Prefab Clarifier / tube settler to provided

3.1.13 Sludge Sump

Existing sump to be used.

3.1.14 FILTER ROOM

Outdoor type filter provided in MS epoxy coated with manual 5 valve system hence room not required

3.1.15 Treated Effluent Collection Tank

Existing tank shall be used.

3.1.16 Pump and Dosing foundation

The pump pads shall be constructed in RCC M 20 with necessary excavation, PCC 1:3:6 base 100 mm thick extending on all the sides etc. Anchor bolts, shall be provided as per the requirement of pumps supplied. The top surface of the dosing pad shall be provided 60mm PCC 1:1.5:3 self finished smooth, after installation of the pumps.

3.1.17 Tertiary Treatment

One MMF (Multi Media Filter) in MS/epoxy coated / CPA (Composite Poly Amide) Pressure vessel, with base frame, MSGI / PVC frontal Pipe Work, Multi port valve shall be provided.

3.1.18 Internal Electrification of MCP cum operator Room

Lighting of MCP room shall consist of following: (i) Supply, fixing, wiring and commissioning of approved make of Distribution board with suitable DP incomer and enough number of SP outgoing MCB's. MCC room: 2 Nos. Light points suitable for 1x40 W TLD lamps. 2 no. 1400 mm ceiling fan with electronic regulator 1 No. 5A plug point 1 15 A Power point with plug & socket 1 No. Light point suitable for 100 W incandescent lamp Bulk head fittings shall be provided if required (Some of said electrical requirement are already available in existing system).

3.2 Interconnecting Piping & Valves

The Interconnecting piping & valves work covered under this contract is the complete interconnecting piping for the effluent treatment plant between various units. The piping & valves shall be designed based on the design flow of the effluent / sludge / chemicals etc. as per requirement and the total schematic drawing is to be submitted for approval.

3.2.1 Last Manhole to Inlet Channel and Channel to Screen Chamber Existing to be used.

3.2.2 Screen & Raw Effluent Collection Tank

Existing shall be used

3.2.3 Raw Effluent Collection Tank to Flash Mixing Tank and Fat Removal Tank

The screened effluent from Raw Effluent Collection Tank shall be pumped to Flash Mixing Tank where it shall be dosed with suitable chemicals for pH adjustment and then the effluent shall flow to Fat Removal Tank where the floating fat and grease molecules shall be separated from the effluent.

3.2.4 Fat removal unit to UASB Feed tank

The pipeline from Fat Removal Unit to the UASB Feed tanks shall be provided. One pipeline of minimum 6kg/cm² should be provided of adequate capacity to discharge all the scum collated from the tank to the SDB.

3.2.5 UASB Feed tank to UASB Feed pumps (Discharge) The pipeline from the suction pocket located at bottom of tank effluent pump discharge nozzle shall be provided with coupler connections. The pipeline from tank shall be provided with a valve before it joins the suction header. The vertical portion of the line located in the tanks shall be provided plumb & with industrial grade clamps firmly fixed to the wall.

3.2.6 UASB Feed pumps to UASB unit / by pass line

The pipeline from pump nozzle onwards up to delivery header and delivery header to the bottom of the UASB unit and the bypass lines shall be provided. Each branch from the pump delivery nozzle up to delivery header shall be provided with necessary concentric reducer, wafer type non return valve, valve etc.

3.2.7 UASB digester to Splitter box at the Aeration tank

The effluent outlet pipe from the UASB unit shall be provided with a water seal arrangement before the line goes to the Splitter box at the aeration tank inlet launder. A branch from the line shall be connected to the bypass line through a tee joint and a reducer, if necessary. Both the main & branch line shall be provided with a valve. Necessary pipe fittings, specials, flanges etc. shall also be provided.

3.2.8 UASB digester to Sludge drying beds

Each of the sludge lines provided to withdraw sludge from the digester of levels when necessary for sampling or disposal, shall be equipped with a valve and shall be combined and taken up to the inlet of the feed channel of the sludge drying beds. Before being led to the beds, a branch shall be provided near the digester for sampling, with a suitable sampling valve. Necessary pipe fittings, specials, flanges etc. shall also be provided.

3.2.10 Aeration tank to Clarifier

The outlet pipe from the aeration tank to the inlet feed well of the clarifier shall be provided. Necessary pipe fittings, specials, flanges etc. shall also be provided. A line located at the bottom of the Aeration tank shall be provided with a drain valve and led to UASB Feed Tank. Necessary pipe fittings, specials, flanges etc. shall also be provided

3.2.11 Sludge outlet from Clarifier to Sludge Holding Tank with Sludge re-circulation pumps.

The sludge line from sludge pocket of the Clarifier to the inlet of the feed channel of the Sludge holding tank shall be provided. Before being led to the Sludge Holding Tank, it shall branch out to the suction header of the Sludge recirculation pumps. Each branch shall be provided with a valve. The suction pipe network for the pumps shall comprise of the pipeline from the suction header to the pump suction. The header shall branch out to individual pump suction nozzle and each branch shall in turn be provided with necessary concentric reducer and a valve to enable interchange ability of pumps.

3.2.12 Sludge recirculation pumps to Aeration tanks

The pipeline from pump nozzle onwards up to delivery header and delivery header to the inlet end of the Aeration tanks and the Sludge Holding Tank shall be provided. The lines shall be so laid as to enable recirculation of sludge from Clarifier to Aeration Tank. Each branch from the pump delivery nozzle up to delivery header shall be provided with necessary concentric reducer, PP swing type non return valve, PP ball valve etc. The discharge line from the delivery header shall lead to the inlet of the Aeration tank as a sludge line.

3.2.13 Sludge Holding Tank to screw press to UASB Feed Tank

The sludge from Sludge Holding Tank shall be taken to screw press/existing Sludge drying beds.

3.2.14 V Notch Chamber to final disposal/reuse The line from the outlet of the V Notch chamber to the final disposal/reuse shall be provided with necessary pipe fittings, specials, flanges etc.

3.2.15 Last Manhole to Inlet Channel and Channel to Screen Chamber

Existing structure shall be used

NB:- All necessary piping of the specs as required for plant commissioning and smooth running of the system included.

4.0 GENERAL NOTES

1. Smooth plastering of all external surfaces wherever specified shall be provided in one coat. Double scaffolding shall be done wherever necessary.
2. MS pipe railing shall be of 32mm dia MS Class B pipes. For bends in railing, regular bends shall be used and no elbows shall be used for this purpose. For supports of railings, MS pipe of class 'B' 32mm dia shall be used. The joints shall be well ground, smoothened. Then the pipe surfaces and supports shall be applied with one coat of anti corrosive red oxide primer followed by one coat of synthetic enamel paint of approved make & shade, for corrosion resistance immediately after fabrication. One coat of synthetic enamel paint shall be again applied on all railings and their supports after testing and commissioning.
3. Water proofing compound wherever used as per manufacturers specification shall ensure chemical and acid resistance to the concrete structures.
4. The piping work described in the above scope of work shall include all necessary pipe inserts required to be provided at various places and all the inserts shall be of suitable construction with puddle flange in the centre and properly grouted so as to prevent leakage.
5. The piping work shall also include all necessary excavation of pipe trenches for underground pipe with bedding of sand and shall also include all necessary pipe supports, plate inserts, etc. HDPE piping shall conform to all the relevant BIS codes, especially BIS 9984, 8008, 7534 & 7634.
6. Pipe anchoring works, Brick masonry pillars, RCC pedestals etc. as required to support the pipe due to site conditions etc. or as may be required for supporting the various pipes above the ground level within the treatment plant area and upto the disposal point, are included in the scope of work.
7. All the necessary valves for the entire treatment plant piping as required shall be provided. The valves shall conform to the relevant BIS standards and shall be provided as per Valves schedule given in the tender document..
8. The scope of work includes construction of necessary valve chambers of suitable size in brick masonry with excavation, PCC 1:3:6 sub-base, inside & outside smooth plaster (1:4), IPS floor 50 mm thick, hinged MS grating frame covers fixed in the RCC M20 cover slab 100 mm thick and spindles for valves on under ground lines extended above finished ground upto the operating level.
9. The general specifications applicable for the piping work shall be as given in the piping work specification in the tender.
10. All necessary pipe fittings, specials, flanges, etc. shall be supplied as required.
11. The RCC wall thicknesses of UASB digester, Equalisation tank, Fat Removal unit, Aeration tank, clarifier shall be minimum 200mm. The raft thickness for UASB, equalisation tank, fat Removal unit, Aeration tank and Clarifier, shall be minimum 250 mm. However, for screen chamber, V-notch and

pump pads wall/raft thickness can be minimum 150mm. It is the responsibility of the successful bidder to check the design and increase the thickness as required, for which nothing extra shall be paid for. No reduction in these minimum thicknesses of RCC is allowed at all.

12. The Reinforcement steel shall be considered as minimum 60 kg/cu.m of RCC. However, it is the responsibility of the successful bidder to design and increase the reinforcement if required for which nothing extra shall be paid for. No reduction less than minimum 60 kg/cum. steel consumption in RCC is allowed at all.
13. All the structural details shall be designed, checked & verified by a chartered registered structural engineer and stability certificate shall be issued by him for the same. The structure designed shall be earthquake proof for the project area zone. A certificate to this extent shall be furnished from the registered Structural consultant. If asked for the design calculation shall be made available to OMFED
14. A plinth protection of 600mm width shall be provided all around the units with a nominal outward slope. Plinth protection shall be done with base PCC 1:3:6, 60mm thick and PCC 1:1.5:3, 50mm thick self finished.
15. The level of inlet line before Screen Chamber shown in the Flow Diagram is tentative and may vary as per the actual site conditions. As per the actual level of the inlet line the levels of all other units will be modified accordingly. Nothing extra shall be paid for such modifications.
16. All the units of the plant shall be joined with a pathway 1.2 m width with a nominal slope on both the sides. Pathway shall be made with minimum 60 mm thick PCC 1:1.5:3, self finished over 100mm thick CC 1:3:6. Where the site may be in contours necessary steps, side walls etc. as required may be provided in brick work, Concrete and IPS etc. Bidder shall assess this at site and the prices shall be inclusive of such requirements.
17. The bidder must, along with the bid, furnish the List of Spares required for normal operation of the plant for two years after commissioning and quote optionally for the spares.
18. The bidder must quote optionally for operation & maintenance of the entire plant for a period of three year after successful commissioning. The bidder must furnish full details along with the terms and conditions etc.
19. RCC M20 shall be volumetric mix of concrete 1:1.5:3 (one part cement : 2 parts of coarse sand : 4 parts of stone aggregate of size 20mm & down by volume).
20. Floors of all effluent water structure shall be provided with 40mm thick IPS (1:1.5:3) flooring with floor glass strip of size 25x3 mm as directed.

BATTERY LIMITS FOR THE EFFLUENT TREATMENT PLANT WORK

The scope of work described in the Schedule of Requirements shall be governed by the following battery limits:

5.1 Raw effluent line from the last manhole at the atmospheric condenser to the Inlet channel, length not exceeding 100mtr.

5.2 Valve at the tee junction on the reuse branch of the gas line between the gas holder and the flare stack. Further necessary connection shall be done by Owner.

5.3 Gas burner end of the flare stack.

5.4 Treated effluent line from the V - notch outlet, line length not exceeding 100mtr. This treated effluent could be used for irrigation purposes within the dairy plant. Supply and installation of further piping shall be arranged by Owner at their own cost and shall not be in the scope of the bidder.

5.5 Supply, erection and charging of the Motor Control Centre shall be in the Contractor's scope. The supply, laying, connection and charging of 3½ x 35sqmm. armoured Aluminium conductor, PVC insulated and sheathed power cable for main incomer of MCC is included in contractor's scope of work. This cable shall be laid underground from the existing Panel at ETP site and its length shall not exceed 120 m. Termination of this cable at both ends with suitable glands and lugs is included in the contractor's scope. Supplying and providing necessary earthing system including two number GI plate type earthing pits, GI strip/wires from MCC to all electrical equipment/ controls is included in contractor's scope.

5.5 Unit lighting and yard lighting in the ETP area including conduits, wiring, cables, light fittings, poles/brackets of approved design is included in Contractors scope.

6.0 TESTING, TRIAL RUNS, COMMISSIONING & HANDING OVER

6.1 Testing and Trial runs

The contractor shall have to test each equipment used for the plant for atleast 72 hrs continuous running with designed load and to the full satisfaction of the Engineer-in-Charge. After testing the individual equipment and stabilization of the plant, the contractor shall run the whole plant at no extra cost to the OMFED/Owner for at least one month as directed by the Engineer-in-Charge. Any defects found in design, workmanship or in any of the equipment shall be rectified by the contractor at his own cost within a reasonable time to be decided by the Engineer-in-charge, and beyond this period suitable penalty shall be levied and the plant shall be tested again for faultless running for one month to the entire satisfaction of Engineer-in-Charge.

Necessary instruments, gauges, supervisory personnel etc. shall be furnished/provided by the contractor free of cost for conducting the tests. The recording of tests result shall be as per formats to be approved by the Engineer-in-Charge and will form part of the completion documents.

6.2 Commissioning and handing over

During trial runs as described above, the contractor shall satisfy the Engineer-in-Charge in all respects regarding the satisfactory quality of effluent, quality of materials, equipment and workmanship used in the plant. Only after satisfying himself, regarding the above points, the Engineer-in-charge will take over the plant and such date of taking over shall be deemed as date of commissioning. The guarantee period described above will start from this date. For specific details, refer the General Conditions of contract clause 87.0. The contractor shall have to obtain necessary statutory approval for setting up of ETP to its commissioning/handing over. The charges for this shall be all included in bid prices.

7.0 PLANT GUARANTEES

The undermentioned clauses shall be read in conjunction with Warranty/Guarantee provisions given elsewhere in this document.

7.1 Manufacturer's Guarantees

The manufacturer's guarantee for design, workmanship and performance for all bought out items shall be made available to the purchaser/owner and shall be valid at least for the entire defects liability period.

In the event of failure of any particular equipment which fails more than three times during the guarantee period as mentioned in clause below, the contractor shall replace at his own cost that equipment. Manufacturer's/Contractor's guarantee, as mentioned in clause above, for such replaced equipment shall also be made available to the purchaser/owner and should be kept at least for one year from the date of last replacement.

7.2 Performance Guarantee

The contractor shall give guarantee for a period of one year from the date of successful commissioning for the treatment plant against design, defective materials, workmanship, performance and guaranteed effluent quality. In the event the commissioning of the plant is not possible due to non-availability of effluent, contractor shall be issued mechanical completion certificate by Engineer-in-Charge provided each equipment is tested satisfactorily as directed by Engineer-in-Charge. However, the contractor shall have to maintain the plant at his own cost, in such a case for a period of three months beyond which period, if he is required to maintain further, he will be paid extra at mutually agreeable rate. However, testing and commissioning of the plant shall be carried out by the Contractor during the Defects Liability period. Any defects found in the workmanship materials or performance of the plant shall be made good by the contractor at his own expense within the time specified by Engineer-in-Charge.

For this purpose the performance guarantee furnished by successful bidder, as per general conditions of contract shall be retained till the completion of the guarantee period as stated above. The contractor, at his own expense shall start and commission the plant and prove that it is giving satisfactory service and desired characteristics of the treated effluent, for one month before handing over the plant to the Owner. During this start up and commissioning period the contractor shall train the Owner's operational staff without any extra cost to the Owner. The contractor shall also have to guarantee the quality of the treated final effluent to meet the specification given in tender document. For given design quantity and quality of untreated effluent, if the Contractor fails to achieve the treated effluent criteria, the Contractor shall rectify the plant at no extra cost, so as to achieve the requisite performance guarantee and satisfy commissioning of the plant to the Engineer-in- Charge.

All the above guarantees will be based on collection and analysis of samples as mentioned in clause below.

7.3 Oxygenation Capacity of Surface Aerator

If required by the Engineer-in-Charge to do so, the supplier shall at his own cost prove the Oxygenation capacity guaranteed by him for the Surface Aerator provided by conducting oxygenation capacity tests on the surface aerator by any standard and internationally recognised method to be approved by the OMFED.

7.4 Collection and analysis of samples

The guaranteed effluent shall be based on complete analysis of composite samples of raw and treated effluent collected after stabilization of the plant as per Special Conditions of Contract.

EXISTING FACILITY & PLANNED MODIFICATIONS AT LUAKERA PLANT: Units and Dimensions

| Sl. No. | Unit | No. | Size, type and material of construction |
|----------------|-----------------------------------------------------------------------------------|------------|--------------------------------------------------------------|
| 1. | Raw Effluent Collection Sump | | Available at site |
| 2. | Reaction tank | 1 | 1.5 x 1.5 x 2.0M |
| 3. | ANF Buffer tank cum feed tank | 1 | Existing collection tank shall be used |
| 4 | USAB Digester | 1 | 2.6.0 M DIA X 6.0 M LIQUID DEPTH, MS epoxy coated |
| 5 | Secondary Clarifier | 1 | 1.8 x2.4 M x2.5m liquid depth, MS epoxy coated |
| 6. | Filter Room | 1 | ROOM not required, outdoor unit shall be provided |
| 7. | Gas Holder Tank with accessories etc. | 1 | not required, open to air gas shall be arranged |
| 8 | Treated Effluent Collection Tank | 1 | Existing RCC tank shall be used |
| 9. | Treated Water Disposal Pump Pad | 1 | 1.0 m x 1.0 m in RCC M20 |
| 10. | Interconnecting path way / steps / stair for the entire plant including lighting. | 1 lot | Existing shall be used, for ANF prefab ladder to be provided |
| 11. | Foundation pads for pumps, blowers, filter, decanter and other mechanical items | 1 lot | As per Manufacturer's Specification |

EQUIPMENT SPECIFICATIONS (Both Retrofitting as well as Additions)

| Sl. No. | Equipment | No. | Rating and capacity |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Flash Mixer | 1 | To fit into Flash Mixing Tanks MOS: SS316 and Speed 70-80 RPM |
| 2. | Mixers for Chemical Tanks | 2 | To fit into 1000L Chemical Dosing Tanks MOS: SS316 and Speed 70-80 RPM |
| 3. | Chemical Dosing System for pH correction | 2+2 | 220 LPH @3.5 kg/cm ² |
| 4. | Automatic Chemical dosing system constituting of PH sensor, analyser & associated controls | 1 lot | As per process design requirements. |
| 5. | UASB Feed Pumps | 1+1 | Capacity: 1.5 -2.0 m ³ /hr @ 20 MWC Head, CI, Horizontal, Centrifugal, Nonclog semi open impeller, self – priming pump. |
| 6. | Bottom effluent grid in HDPE pipes, nozzles, Attached media, Settler arrangement with overflow launders gas dome, safety devices suitable for USAB | 1 lot | As per process design requirements. |
| 7. | Air Blower for Aeration Tank | 1+1 | Capacity 150 m ³ /hr @ MWC |
| 8. | Fine Bubble Tube diffuser | 1 lot | As per process design requirements |
| 9. | Secondary clarifier mechanism | 1 | Prefab tube setter mechanism in MSEP. |
| 10. | V-Notch Plate | 1 | As per process design requirements in SS-304 |
| 11. | Filter Feed Pumps | 1+1 | Capacity: 1.5-2.0 m ³ /hr @ 25-30 MWC Head, CI, Horizontal, Cetrifugal, non-clog semi-open impeller, self priming pump. |
| 12. | Multi Media Filter | 1 | MMF (Multi Media Filter) in CPA (Composite Poly Amide) Pressure Vessel size 30"x72x' of 10 Kg/cm ² as DP (design pressure) with base frame, frontal Pipe work, White Multi port valve (imported) with different grades of media line pebbles, coarse silex, anthracite, grades & washed quartz sand etc. |

| | | | |
|-----|---------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13. | Final Treated Effluent Disposal pumps | 1+1 | As per process requirement |
| 14. | Screw Press Feed Pumps | 1+1 | As per process requirement. |
| 15. | Screw Press | 1 | As per process requirement |
| 16. | Flow measurement and integration instrument | 2.0 | To measure and totalize 10-20 m ³ /hr flow at inlet and outlet of ETP and at UASB feed and Return line suitable flow meter shall be installed. |
| 17. | Pressure Gauges | 1 lot | Glycerine filled Dial Type fitted at discharge of each pump, filter and necessary location. |
| 18. | Motor control center | 01 | For receiving and distributing LT power |
| 19. | Power and control cables | 1 lot | for connecting MCC with all motors and controls |
| 20. | Earthing system, isolators/PB station etc. | 1 lot | For safety and operation |
| 21. | Lighting DB | 1 no. | For Effluent Treatment Plant Lighting |
| 22. | Interconnecting Piping | 1 Lot | MS/GI -b class / HDPE 63 Grade, 4/6 KGS/Sq. cm, pressure rating of suitable sizes will be provided. As per the detail design and specification for completion and hand over of ETP. |
| 23. | Piping schedule | | As per process requirement. |
| 24. | Valve & fittings | | As per process requirement. |

Note: This schedule indicates the minimum requirement of the pipe and valve segments for the plant. However, in case, any additional piping is felt essential during the bidding/ work execution to complete the ETP works, the same shall be provided by the Contractor without any extra cost. OD implies outer diameter of the pipe wherever specified. HDPE Sr II implies 4.0 kg/sq.cm pressure rating pipes HDPE Sr III implies 6.0 kg/sq.cm pressure rating pipes. Sr stand for Scheduled.

LIST OF MAKES:

| Item Description | Makes | Item Description | Makes |
|--------------------------------|--------------------------|-------------------------------|-------------------------|
| Sewage Submersible Pump | Kirloskar /CRI /Equiv. | MS/GI Pipe | Jindal/ Tata/ Surya |
| Centrifugal Pump | Kirloskar/ CRI/ Equiv | Piping UPVC/CPVC | Astral/ Supreme/ Prince |
| Filter Feed Pumps | Kirloskar/ CRI/Equiv. | Butterfly Valve | Sant/ Zoloto/ Leader |
| Sludge Recycle Pump | Kirloskar/ Wilo | Fine/ Coarse Diffusers | BWS Approved |
| Dosing Pump | Edose/ Initiative/ seko | Pressure Gauges | H Guru |
| FRP Pressure Vessel | Pentair/ Aventura/Equiv. | MCC Panel | BWS Approved |
| pH Meter | Aster/ Reputed | Switch Gear | L&T/ Schneider/ Reputed |
| Bar Screen (SS/MS) | Bimal Water Solutions | Level Switches/ Gauges | Reputed |
| Fabricated Tanks | Bimal Water Solutions | | |
| Tube Deck /FAB Media | BWS Approved | | |
| Air Blower | Everest/ Airvac/ Equiv | | |

SCOPE MATRIX – ELECTRICAL

| SN | Description | Supply | | Erection & Commissioning | |
|----|------------------------------------------------|-------------|----------|--------------------------|----------|
| | | By Supplier | By Owner | By Supplier | By Owner |
| 1 | Motors as per Equipment list | √ | X | √ | X |
| 2 | Local control Panel | √ | X | √ | X |
| 3 | Power Feeder & Distribution | X | √ | X | √ |
| 4 | Motor Control Center (MCC) | √ | X | √ | X |
| 5 | Local Push Button Station | √ | X | √ | X |
| 6 | Incoming Power Cable to MCC | √ | X | √ | X |
| 7 | Power Cable from MCC to Motors | √ | X | √ | X |
| 8 | Control cables from MCC to LPBS | √ | X | √ | X |
| 9 | Control Cables from MCC to Local Control Panel | √ | X | √ | X |
| 10 | Field Cabling up to field junction boxes | √ | X | √ | X |
| 11 | Glands and Lugs | √ | X | √ | X |
| 12 | GI Cable Trays | √ | X | √ | X |
| 13 | Structural steel for cable tray supports | √ | X | √ | X |
| 14 | Plant Earthing | √ | X | √ | X |
| 15 | Plant illumination System | √ | X | √ | X |

SECTION - IV
SCHEDULE I :PRICE BID

| <u>for Renovation & Modernisation of existing ETP at Rourkela Dairy</u> | | | | | | | |
|------------------------------------------------------------------------------------|------------------------------|--------------|------------|-------------------------|---------------------------|--------------------------|----------------------------|
| Slno | Description | Specs | Qty | Unit Supply cost | Unit Erection cost | Total Supply cost | Total Erection cost |
| 1 | Feed pumps | | | (in Rs.)) | | | |
| 1.1.1 | Submersible Pumps | 2 HP,415 V | 3 nos | | | | |
| 1.1.2 | Switch in for pumps | 2 HP,415 V | 1 nos | | | | |
| 1.1.3 | Low Level Switch | | 1 nos | | | | |
| 1.1.4 | Installation Job work | Sch80, UPVC | 1 lot | | | | |
| 2 | NBAF for fat removal | | | | | | |
| 1.2.1 | Nano bubble filter | FRP | 2 nos | | | | |
| 1.2.2 | Ozone Generator | 1 HP,220V | 2 nos | | | | |
| 1.2.4 | Installation Job work | | 1 lot | | | | |
| 3 | Ammonia Stripper | | | | | | |
| 1.3.1 | Stripper tower | | 1 nos | | | | |
| 1.3.2 | Vacuum Blower | 0.5HP | 1 nos | | | | |
| 1.3.3 | Installation Job work | | 1 lot | | | | |
| | Biological Aeration | | | | | | |
| 2.2.1 | Aerators | SS or CI | 6 nos | | | | |
| 2.2.3 | Oxygen Surge tank | 200 lts | 1 nos | | | | |
| 2.2.4 | Oxygen generators | 220 V | 1 nos | | | | |
| 2.2.5 | Installation Job work | Sch40, CPVC | 1 lot | | | | |
| | Instrumentation | | | | | | |
| 2.4.1 | Online PH indicator tran | 4-20mAmps | 1 nos | | | | |
| 2.4.2 | Online ORP indicator tra | 4-20mAmps | 1 nos | | | | |
| 2.4.5 | Dissolved Oxygen transm | 4-20mAmps | 1 nos | | | | |
| 3 | Tertiary Treatment | | | | | | |
| 3.1.1 | Nano Bubble filter | FRP | 1 nos | | | | |
| 3.1.2 | Nano Bubble air mixer | 1 HP,220V | 1 nos | | | | |
| 3.1.3 | Ozone generators | 2 Amp, 220V | 2 nos | | | | |
| 3.1.4 | pipeline & panel | | 1 nos | | | | |
| 3.1.5 | Installation Job work | OVC | 1 nos | | | | |

| | | | | | | | | |
|-----|-----------------------------------------------|--------------------|---------|--|--|--|--|--|
| | Control Panel | | | | | | | |
| 5.1 | Centralised control Panel with all protection | | 1 no | | | | | |
| | Make of Switchgear | L&T/Schnider/eq | | | | | | |
| | Make of Pumps | Crompton/CRI/Eq | | | | | | |
| | Make of Pipes & Valves | Astral/Supreme/ Eq | | | | | | |

| | | | | | | | | |
|--------------|--|--|--|--|--|--|--|--|
| Total | | | | | | | | |
|--------------|--|--|--|--|--|--|--|--|

Note:

1. Though breakup prices has been asked above, this is only to facilitate preparation & payment of bills and this breakup prices shall not be considered for evaluation of bids or additional payments in case there is any variation in quantity, as total price of bid is on turnkey basis FOR site inclusive of all taxes, duties, work contract tax etc. & installation.

2. Unit rate to be indicated for following to take care of variation as mentioned in battery limits.

2.1 Piping from existing last manholes to ETP Plant --Rs/metre.

2.2 Gas piping from ETP for reuse ----Rs/metre.

**2.3 Treated Effluent piping from the V notch
to the point of disposal /reuse ----Rs/metre**

2.4 Incoming cable to MCC ----Rs/metre.

TOTAL PRICE

| Sl. NO | DESCRIPTION | UNIT | UNIT RATE (in RS.) | TOTAL AMOUNT (in RS.) |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------|-----------------------|
| 1 | Renovation & Modernisation (Civil, electrical & Mechanical) of existing 30KLD ETP including design, construction, fabrication, supply, erection, testing & commissioning for design, construction, fabrication, supply, erection, testing and commissioning & trial run with nano-bubble technology at Rourkela dairy, Luakera, Dist. Sundergarh on Turnkey execution basis as per the schedule of requirement and technical specifications given in the bidding document | 1 JOB | | |
| 2. | Statuary approval and inspection. | 01 Job | | |
| 3. | AMC after handed over of effluent treatment plant for one year including supply of labour tools and chemical used for the treatment process. | one year | | |
| Total (inclusive of GST @18%) | | | | |

(Rupees-----only)

SCHEDULE II

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. :PROJ/158/RKVY/REN/18/:

Name and Address of Employer : THE ORISSA STATE CO-OPERATIVE
MILK PRODUCERS' FEDERATION LTD.,
D - 2, SAHID NAGAR, BHUBANESWAR
PIN – 751 007.

Description of Works: Renovation & Modernisation (Civil, electrical & Mechanical) of existing 30KLD ETP including design, construction, fabrication, supply, erection, testing & commissioning for design, construction, fabrication, supply, erection, testing and commissioning & trial run with nano-bubble technology at Rourkela dairy, Luakera, Dist. Sundergarh on Turnkey execution basis.

Dear Sirs,

1.0 Having examined the Drawings, Conditions of Contract, 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, Conditions of Contract, Specifications and Schedule of quantities for the sum of Rs. _____ (Rs. _____) or such other sum as may be ascertained 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 last day 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 in approved format / Demand draft to be jointly and severally bound with us in amount of 10% 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 90 days from the date of bid opening 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

Witnesses:

1. Signature:

Name:

Address:

2. Signature:

Name:

Address:

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

Note :-

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

TECHNICAL DEVIATION STATEMENT FORM

1.) The following are the particulars of deviations from the requirements of the tender 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

Note :-

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

SCHEDULE III
FORM OF AGREEMENT FOR EFFLUENT TREATMENT PLANT
(On Non-Judicial Stamp Paper of minimum value of Rs. 100/- or as per Stamp act of local state Govt.)

THIS AGREEMENT is made and executed on the____day of____ (Two thousand____) between THE ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LIMITED and having its registered office at BHUBANESWAR – 751 007 (herein after referred to as OMFED which expression shall, unless repugnant to the context or meaning thereof, include the successors and assignees of the OMFED) 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 OMFED is desirous that certain Works should be executed, viz

____ and has, by Letter of Acceptance dated _____, accepted a bid by the Contractor for the execution, completion and maintenance of such works,

NOW THIS AGREEMENT WITNESSTH 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
 - iii) the said bid and Appendix
 - iv) the Technical Specifications
 - v) the Schedule of Quantities
 - vi) the Drawings
 - vii) General and Special Conditions of Contract
 - viii) Form of Bank Guarantees

* The Contractor shall not fill up this form.

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 OMFED to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the OMFED to execute, complete and maintain the works in conformity in all respects with the provisions of the Contract.

5.0 The OMFED 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 their respective Common Seals to be hereunto affixed the day, month and year first above written.

Signed, sealed & delivered for and
on behalf of the within named OMFED
by the hands of its Authorized
Signatory.

**Signed, sealed and delivered for
and on behalf of the within
named Contractor, the other part.**

Authorized Signatory

Authorized Signatory

The Orrisa Milk Producers'
Federation Limited (OMFED)

Contractor

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

Note: The above value of stamp duty should be minimum Rs.100/- or as per latest notification of Local Government.

SCHEDULE IV
ACCEPTABLE FORM OF BANK GUARANTEE

Proforma of Bank Guarantee for Bid Security On Non-Judicial Stamp Paper of Rs.60/-

Bank Guarantee no. _____

Date: _____

This deed of guarantee made this _____ day of 20____ (Two thousand and _____) by (Name and address of the Bank), hereinafter referred to as the Bank, which shall unless repugnant to the context or the meaning thereof includes its legal representatives, successors and assigns and the ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD. (hereinafter referred to as the OMFED) which expression shall be unless repugnant to the context or meaning thereof include its legal representative, successors or assigns.

Whereas the OMFED has invited bids for the supply, installation, testing, commissioning, trial run and guaranteeing of the proposed _____

_____ by the tender notice reference no. _____ .

AND WHEREAS M/S _____

_____ (Name and the address of the bidders) who having submitted their bids (hereinafter referred to as the Tender) and have agreed to deposit to the OMFED an amount indicated in the tender notice as per the terms and conditions of the bidding documents. AND WHEREAS the OMFED is also willing to accept a Bank guarantee in lieu of payment by demand draft of any amount equivalent to the amount of bid security required to be deposited by the bidder to the OMFED which guarantee shall be kept valid for 120 days after the day of the opening of the bids.

In consideration of the OMFED 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 OMFED the amount of bid security or any part thereof not deposited by the bidder to the OMFED at any time (time being the essence of the Contract) when the OMFED asks for the same as per the terms and 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 OMFED in writing and the guarantee shall be continuous and irrevocable guarantee up to a sum of Rs.-----

OMFED

CONTRACTOR

(Rupees-----only) provided always that any indulgence or forbearance on the part of the OMFED to the said bidder. With or without the consent of the Bank shall not prejudice or restrict remedies against the bank nor shall the same in any event be a ground of defense by the Bank against the OMFED.

In case the OMFED 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 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 OMFED in its bidding document and payment will be made to the OMFED 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 OMFED with or without the consent of the Bank or any alternations in the obligations of the parties or by an indulgence, forbearance shown by the OMFED to the bidder.

This guarantee shall be in addition to and without prejudice to any other securities or remedies which the OMFED may have or hereafter possess against the bidder and the OMFED shall be under no obligations to marshal in favour of the Bank any such securities or fund or assets that the OMFED 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 OMFED on OMFED's serving with a notice requiring the payment of the amount and such notice shall be served on the Bank either by actual delivery thereof to the Bank or by dispatching thereof by to the Bank by registered post at the address of the said Bank. Any notice sent to the Bank at its address by registered post shall be deemed to have been duly served on the Bank notwithstanding that the notice may not in fact have been delivered to 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 unless the guarantee is renewed or a claim is preferred against the bank within three months from the said date all rights of the OMFED under this guarantee shall cease and the bank shall be released and discharged from all liabilities hereunder.

Notwithstanding anything contained here before, our liability under this guarantee is restricted to Rs. ----- (Rupees----- only) being the amount of the Bid security and it shall remain in force until-----.

Place

Signature

Seal

Code no.

Note: Bidders should ensure that the seal and code no. of signatory is put by the Bankers, before submission of the Bank guarantees.

Proforma of bank guarantee for Performance security On Non-judicial Stamp
Paper of Rs.60/-

Bank Guarantee No.

Date:

This deed of guarantee made this _____ day of 20 _____ (Two thousand and _____) by (Name and address of the bank) hereinafter referred to as the bank, which shall unless repugnant to the context or the meaning thereof includes its legal representatives, successors and assigns and the ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD. (hereinafter referred as to the OMFED) which expression shall unless repugnant to the context or meaning thereof includes its legal representatives, successors and assigns .

Whereas the ORISSA STATE MILK CO-OPERATIVE PRODUCERS' FEDERATION LTD. has awarded a contract bearing No. _____ on M/s _____ (Name and the address of the party) hereinafter referred to as the Contractor, for the supply installation, commissioning, completion and the guaranteeing of _____

And whereas the Contractor has agreed to submit a performance security in the form of bank guarantee to the OMFED as per the terms and conditions of the bidding documents. And the contract which will be kept valid upto _____ calendar months from the date of bank guarantees (the period should be till end of period of maintenance) and whereas the bank and its duly constituted agent and officer has already read and understood the contract between the OMFED and the Contractor.

In consideration of the OMFED having agreed to award the contract on the Contractor, we _____ (the bank) do hereby guarantee, undertake, promise and agree with the OMFED , its legal representatives, successors, and assigns that the within named (the name of the Contractor) their legal representatives , assignees will faithfully perform and fulfill everything within the bidding document and the contract order on their part to be performed or fulfilled, at the time (time being the essence of the contract) and in manner therein provided , do all obligations there under and we further undertake and guarantee to make the payment to the OMFED a sum of Rs _____ (Rupees _____ only). Being 10% of the contract value ,in case the Contractor , their legal representatives, assignees do not faithfully perform and fulfill everything within the bidding document and the contract order on their part to be performed or fulfilled, at the time and in manner therein provided and do not willfully and promptly do all obligations there under. In case the Contractor fails to perform or fulfill the contract as per the terms and conditions agreed upon, the OMFED is entitled to demand an amount equivalent to 10% of the contract value from the Contractor and the demand made by the OMFED itself will be conclusive evidence and proof that the Contractor has failed to perform or fulfill his obligations under the contract and neither the

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Contractor nor the bank shall be entitled to raise any dispute regarding the reasons for the failure of performance or fulfillment on any ground whatsoever.

We, (the name of the bank), do hereby undertake to pay an amount equivalent to 10% of the contract value, being the amount due and payable under this guarantee. Without any demur, merely on a demand from OMFED stating that the amount claimed is due by way of Non-performance of the contractual obligations as aforesaid by the contractor or by the reason of the contractor's failure to perform the said contractual commitments, any such demand made on the banks shall be conclusive as regards the amount due and payable by the bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____ (Rupees _____ only being the amount equal to 10% of the contract value.

We, the bank further agree that the performance security herein contained shall remain in full force and effect for a period of _____ calendar months from the date of the bank guarantee. (the period shall be till the end of period of maintenance) whichever is later or till the OMFED certifies that the terms and conditions of the said contract have been fully and properly carried out by the said Contractor and accordingly discharge the guarantee, unless a demand or a claim under this guarantee is made on us in writing by the OMFED on or before _____ (the date shall be 90 days after the end of the period of maintenance) we shall be discharged from all liabilities under this performance security hereafter.

We, the bank, further agree with the OMFED that the OMFED shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of bidding document and the contract or to extend the time of performance by the said Contractor from time to time and any of the power exercisable by the OMFED against the Contractor and forbear or enforce any of the terms and conditions relating to the said bidding document and the contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said contractor or for any forbearance, act or omission on the part of the OMFED to the said Contractor by any such matter or thing whatsoever which under the law relating to the sureties would but for this provision have effect of so relieving us. This guarantee shall be in addition to and without prejudice to any other securities or remedies which the OMFED may have or hereafter possess in respect of the works executed or intended to be executed and the OMFED shall be under no obligation to marshal in favour of the bank any such securities or funds or asset that the OMFED may be entitled to receive or have a claim upon and the OMFED 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 OMFED on serving us with a notice, 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.

Any notice sent to the bank at its address by registered post shall be deemed to have been duly served on the bank notwithstanding that the notice may not in fact have been delivered to the bank.

In order to give full effects to the provisions of this guarantee the bank hereby waives all rights inconsistent with the above Rs. _____ (Rupees _____ Only). The guarantee shall remain in force until _____ and unless the guarantee is renewed or a claim is preferred against the bank within three months from the said date (the date of expiry) all rights of the OMFED under the guarantee shall cease and the bank shall be released and discharged from all liabilities hereunder.

Place

Signature

Date

Seal

Code no.

Note:

The Contractor should ensure that seal and the code no. of the signatory is put by the bankers, before submission of the bank guarantees.

SECTION – V

ANNEXURE-I

Declaration from to be signed by the Bidders submitting the offer downloaded from website (We Declaration From)

We hereby declare that:

- 1) “We have downloaded the tender document form website <http://www.omfed.com> and printed the same. We have verified the content of the printed document form the website and there is no addition, no deletion and or no alteration to the content of the tender document”.
- 2) We are aware that, if at any stage, addition/deletion/alteration/manipulation is found in the content of the tender document. Our offer will be summarily rejected/tender will be terminated.

In case of any dispute, the hard copy of Tender documents approved by competent Authority and preserved in the office of Managing Director, OMFED, Bhubaneswar shall prevail and considered ad final and we shall have no objection for this.

(I/We hereby undertake that information’s furnished in the tender document are correct to the best of our knowledge and belief)

Seal & Signature of the Bidder

ANNEXURE-II

FORMAT FOR EXPERIENCE OF WORK/WORKS OF ETP CAPACITY WISE

Information regarding Bidder executed/completed contract of similar nature during the three financial years i.e. 2021-22, 2020-21, 2019-20, in either of the following: -

Two contracts/ works of similar nature each capacity not less than 80% of the tendered capacity of the proposed ETP

Details of the work & enclosure

.....

.....

.....

OR

There contracts/works of similar nature each capacity not less than 60% of the tender capacity of the proposed ETP

Details of the work & enclosure

.....

.....

.....

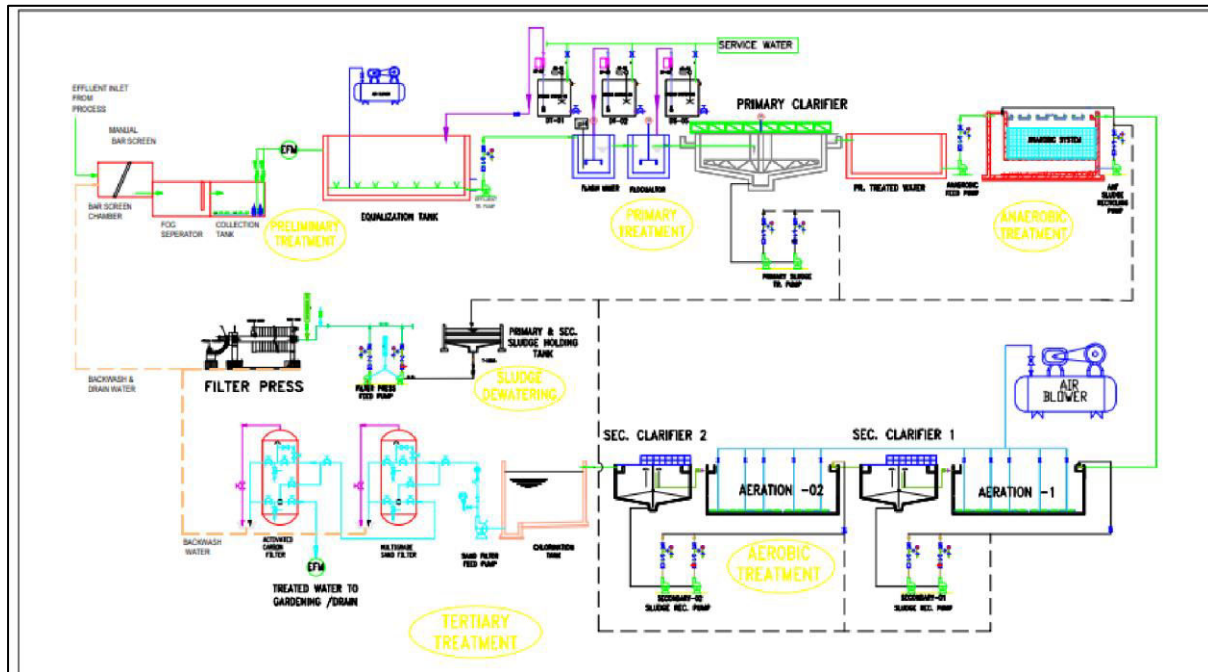
Similar nature of works means Effluent treatment plants based on aerobic treatment (Extended Aeration), for similar bio-degradable organic waste, preferably for successfully executed project for Dairy/Food/Wastewater Industry in India.

(I/We hereby undertake that information's furnished in the tender document are correct to the best of our knowledge and belief)

Seal & Signature of the Bidder

ANNEXURE III

Proposed ETP Layout-30 KLD



Proposed P&I of ETP- 30 KLD

