



# **CHENNAI METROPOLITAN WATER SUPPLY & SEWERAGE BOARD**



**TENDER NO: CMWSSB/CNT/WSS/ICB/JICA/DESAL/CP01/018/2020-21**

**LOAN AGREEMENT NO. ID-P267  
JICA FUNDED PROJECT**

**REQUEST FOR PROPOSAL DOCUMENT**

**FOR**

**PROJECT FOR CONSTRUCTION OF CHENNAI  
SEAWATER DESALINATION PLANT (I)**

**PART-I  
(BIDDING PROCEDURE)**

**PROCUREMENT OF DESIGN/ENGINEERING, CONSTRUCTION, COMMISSIONING OF 400 MLD  
SEAWATER REVERSE OSMOSIS (SWRO) DESALINATION PLANT AT PERUR, CHENNAI WITH  
20 YEARS OF OPERATION AND MAINTENANCE (DBO BASIS)**

**INTERNATIONAL COMPETITIVE BIDDING**

**PROJECT MANAGEMENT CONSULTANTS**

SMEC International Pty Ltd.  
NJS Engineers India Pvt. Ltd.  
Tata Consulting Engineers Ltd.  
SMEC India Pvt. Ltd.

**SUPERINTENDING ENGINEER  
(CONTRACTS & MONITORING)  
CHENNAI METROPOLITAN  
WATER SUPPLY & SEWERAGE  
BOARD**

**Date of Issue of Request for Proposal: xx/xx/xx**

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## **Invitation for Bids**

## Invitation for Bids

Date: Feb 2021

Tender Number : CMWSSB/CNT/WSS/ICB/JICA/DESAL/CP01/018/2020-21

Employer: Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB)

Country: India

JICA Loan No: ID-P267

Project Name: Project for Construction of Chennai Seawater Desalination Plant (I)

Contract Name : Procurement of Design/Engineering, Construction, Commissioning of 400 MLD Seawater Reverse Osmosis (SWRO) Desalination Plant at Perur, Chennai with 20 years of Operation and Maintenance (DBO Basis)

1. The Government of India (GoI) for Government of Tamil Nadu (GoTN) for Chennai Water Supply and Sewerage Board (CMWSSB) has received a loan from Japan International Cooperation Agency (JICA) towards the cost of Project for Construction of Chennai Seawater Desalination Plant (I). It is intended that part of the proceeds of this loan will be applied to eligible payments under the Contract for Procurement of Design/Engineering, and Construction, Commissioning of 400 MLD Seawater Reverse Osmosis (SWRO) Desalination Plant at Perur, Chennai with 20 years of Operation and Maintenance (DBO Basis) for Package No. CP01.
2. The Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) now invites sealed Bids from prequalified eligible Bidders for the Procurement of Design/Engineering, and Construction, Commissioning of 400 MLD Seawater Reverse Osmosis (SWRO) Desalination Plant at Perur, Chennai with 20 years of Operation and Maintenance (DBO Basis) for Package No. CP01 ("the Works").
3. It is not permissible to transfer this Invitation for Bids to any other firm.
4. A firm will be selected under Least Cost Selection (LCS) Method and procedures described in this RFP, in accordance with the applicable Guidelines for procurement under Japanese ODA Loans. Only Prequalified Bidders will be issued the RFP document. For any further information, Bidders can contact the office of Superintending Engineer (Contracts & Monitoring), CMWSSB during the office hours, between IST 10:00 hours to 17:45 hours on all working days.

**Superintending Engineer (Contracts and Monitoring),**  
Office of Superintending Engineer (Contracts and Monitoring),  
Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB),  
Urban Administrative Building, 3<sup>rd</sup> Floor, No.75, Santhome High Road,  
Raja Annamalaipuram, Chennai 600 028  
Telephone: 044 28451300 Ext: 209, Facsimile: 044 28458181  
E-mail: [secandm@cmwssb.in](mailto:secandm@cmwssb.in)  
Website: <https://chennaietrowater.tn.gov.in>

5. Please inform us in writing at the following address, upon receipt:

- a) That you have received the Letter of Invitation; and
  - b) Whether you intend to submit a proposal alone or intend to enhance your experience by requesting permission to associate with other firm(s).
6. Bids must be delivered to the address above on or before *[insert time]* on *[insert date]* and must be accompanied by a Bid Security of INR 14,00,00,000 (Indian Rupees Fourteen Crores only).
  7. Bids will be opened in the presence of Bidders' representatives who choose to attend at *[insert time and date]* at the office of:

**Superintending Engineer (Contracts and Monitoring),**  
Office of Superintending Engineer (Contracts and Monitoring),  
Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB)  
Urban Administrative Building, 3<sup>rd</sup> Floor, No.75, Santhome High Road,  
Raja Annamalaipuram, Chennai 600 028  
Telephone: 044 28451300 Ext: 209, Facsimile: 044 28458181  
E-mail: [secandm@cmwssb.in](mailto:secandm@cmwssb.in)  
Website: <https://chennaietrowater.tn.gov.in>

Yours Sincerely,

CMWSS Board.

## **PART 1. BIDDING PROCEDURES**

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# **Section I. Instructions to Bidders**



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## A. General

1. **Scope of Bid**
  - 1.1 In connection with the Invitation for Bids **specified in the Bid Data Sheet (BDS)**, the Employer, as **specified in the BDS**, issues these Bidding Documents (hereinafter referred to as “Bidding Documents”) for the procurement of Electrical and Mechanical Plant, and for Building and Engineering Works, Designed by the Contractor as specified in Section VI, Employer’s Requirements. The name, identification, and number of the lot(s) (contract(s)) comprising this International Competitive Bidding (ICB) are **specified in the BDS**.
  - 1.2 Throughout these Bidding Documents:
    - (a) the term “in writing” means communicated in written form and delivered against receipt;
    - (b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and  
“day” means calendar day.
2. **Source of Funds**
  - 2.1 The Borrower specified in the BDS has applied for or received a Japanese ODA Loans from Japan International Cooperation Agency (hereinafter referred to as “JICA”), with the number, in the amount and on the signed date of the Loan Agreement specified in the BDS, toward the cost of the project specified in the BDS. The Borrower intends to apply a portion of the proceeds of the Loan to eligible payments under the Contract(s) for which these Bidding Documents are issued.
  - 2.2 Disbursement of a Japanese ODA Loans by JICA will be subject, in all respects, to the terms and conditions of the Loan Agreement, including the disbursement procedures and the applicable Guidelines for Procurement under Japanese ODA Loans specified in the BDS. No party other than the Borrower shall derive any rights from the Loan Agreement or have any claim to the Loan proceeds.
  - 2.3 The above Loan Agreement will cover only part of the project cost. As for the remaining portion, the Borrower will take appropriate measures for finance.

### 3. Corrupt and Fraudulent Practices

3.1 It is JICA's policy to require that Bidders and Contractors, as well as Borrowers, under contracts funded with Japanese ODA Loans and other Japanese ODA, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, JICA:

- (a) will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;
- (b) will recognize a Bidder or Contractor as ineligible, for a period determined by JICA, to be awarded a contract funded with Japanese ODA Loans if it, at any time, determines that the Bidder or the Contractor has engaged in corrupt or fraudulent practices in competing for, or in executing, another contract funded with Japanese ODA Loans or other Japanese ODA; and
- (c) will recognize a Contractor as ineligible to be awarded a contract funded with Japanese ODA Loans if the Contractor or a Subcontractor, who has a direct contract with the Contractor, is debarred under the cross debarment decisions by the Multilateral Development Banks. Such period of ineligibility shall not exceed three (3) years from (and including) the date on which the cross debarment is imposed.

"Cross debarment decisions by the Multilateral development Banks" is a corporate sanction in accordance with the agreement among the African Development Bank Group, Asian Development Bank, European Bank for Reconstruction and Development, Inter-American Development Bank Group and the World Bank Group signed on 9 April, 2010 (as amended from time to time). JICA will recognize the World Bank Group's debarment of which period exceeds one year, imposed after 19 July, 2010, the date on which the World Bank Group started cross debarment, as "cross debarment decisions by the Multilateral Development Banks."

The list of debarred firms and individuals is available at the electronic address **specified in the BDS**.

JICA will recognize a Bidder or Contractor as ineligible to be awarded a contract funded with Japanese ODA Loans if the Bidder or Contractor is debarred by the World Bank Group for the period starting from the date of the Invitation for Bid, if prequalification has not been conducted; or the date of Advertisements for Prequalification, if prequalification has been conducted, up to the signing of the contract, unless (i) such debarment period does not exceed one year, or (ii) three (3) years have passed since such debarment decision.

If it is revealed that the Contractor was ineligible to be awarded a contract according to the above, JICA will, in principle, impose sanctions against the Contractor.

If it is revealed that a Subcontractor, who has a direct contract with the Contractor, was debarred by the World Bank Group on the subcontract date, JICA will, in principle, require the Borrower to have the Contractor cancel the subcontract immediately, unless (i) such debarment period does not exceed one year, or (ii) three (3) years have passed since such debarment decision. If the Contractor refuses, JICA will require the Borrower to declare invalidity or cancellation of the contract and demand the refund of the relevant proceeds of the Loan or any other remedies on the grounds of contractual violation.

3.2 Furthermore, Bidders shall be aware of the provision stated in Sub-Clause 15.6 [Corrupt and Fraudulent Practice] of General Conditions.

#### **4. Eligible Bidders**

4.1 A Bidder may be a firm that is a single entity or any combination of such entities in the form of a joint venture (JV) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent. In the case of a JV:

- (a) all members shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms, and
- (b) the JV shall nominate a Representative who shall have the

authority to conduct all business for and on behalf of any and all the members of the JV during the bidding process and, in the event the JV is awarded the Contract, during Contract execution.

- 4.2 A Bidder shall not have a conflict of interest. A Bidder shall not be employed under any of the circumstances set forth below throughout the bidding/selection process and/or the execution of the Contract unless the conflict has been resolved in a manner acceptable to JICA.
- (a) A firm shall be disqualified from providing goods or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of a project that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm. This provision does not apply to the various firms (consultants, contractors, or suppliers) only due to the reason that those firms together are performing the Contractor's obligations under a turnkey or design and build contract.
  - (b) A firm that has a close business relationship with the Borrower's professional personnel, who are directly or indirectly involved in any part of: (i) the preparation of the prequalification and Bidding Documents for the Contract, (ii) the prequalification and Bid evaluation, or (iii) the supervision of such Contract, shall be disqualified.
  - (c) Based on the "One Bid Per Bidder" principle, which is to ensure fair competition, a firm and any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm shall not be allowed to submit more than one Bid, either individually or as a member in a JV. A firm (including its affiliate), if acting in the capacity of a Subcontractor in one Bid, may participate in other Bids, only in that capacity.
  - (d) A firm having any other form of conflict of interest other than (a) through (c) above shall be disqualified.

- 4.3 A Bidder shall be from any of the eligible source countries indicated in Section V, Eligible Source Countries of Japanese ODA Loans.
- 4.4 A Bidder that has been determined to be ineligible by JICA in accordance with ITB 3.1 shall not be eligible to be awarded a Contract.
- 4.5 This bidding is open only to prequalified Bidders unless **specified in the BDS.**
- 4.6 A Bidder shall provide such evidence of its continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.
- 5. Eligible Plant, Material and Services**
- 5.1 The Plant, Material and Services to be supplied under the Contract shall have their origin in any of the eligible source countries indicated in Section V, Eligible Source Countries of Japanese ODA Loans, and all expenditures under the Contract will be limited to such Plant, Material and Services.
- 5.2 For purposes of ITB 5.1 above, “origin” means the place where the plant, or component parts thereof are mined, grown, produced or manufactured, and from which the services are provided. Plant components are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that is substantially different in its basic characteristics or in purpose or utility from its components.

## **B. Contents of Bidding Documents**

### **6. Sections of Bidding Documents**

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

#### **PART 1 Bidding Procedures**

- Section I. Instructions to Bidders (ITB)
- Section II. Bid Data Sheet (BDS)
- Section III. Evaluation and Qualification Criteria (EQC)
- Section IV. Bidding Forms
- Section V. Eligible Source Countries of Japanese ODA Loans

#### **PART 2 Employer's Requirements**

- Section VI. Employer's Requirements

#### **PART 3 Conditions of Contract and Contract Forms**

- Section VII. General Conditions (GC)
- Section VIII. Particular Conditions (PC)
- Section IX. Annex to the Particular Conditions - Contract Forms

6.2 The Invitation for Bids issued by the Employer is not part of the Bidding Documents.

6.3 Unless obtained directly from the Employer, the Employer is not responsible for the completeness of the Bidding Documents, responses to requests for clarification, the minutes of the pre-bid meeting (if any), or Addenda to the Bidding Documents in accordance with ITB 8. In case of any contradiction, documents obtained directly from the Employer shall prevail.

6.4 The Bidder is expected to examine all instructions, forms, terms, and Employer's Requirement in the Bidding Documents, and to furnish with its Bid all information and documentation as is required by the Bidding Documents.



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

- 7.1 A Bidder requiring any clarification of the Bidding Documents shall contact the Employer in writing at the Employer's address **specified in the BDS** or raise his enquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond in writing to any request for clarification, provided that such request is received no later than fourteen (14) days prior to the deadline for submission of Bids. The Employer shall forward copies of its response to all Bidders who have acquired the Bidding Documents in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. If so **specified in the BDS**, the Employer shall also promptly publish its response at the web page **identified in the BDS**. Should the clarification result in changes to the essential elements of the Bidding Documents, the Employer shall amend the Bidding Documents following the procedure under ITB 8 and ITB 24.2.
- 7.2 The Bidder is advised to visit and examine the Site and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. The costs of visiting the site shall be at the Bidder's own expense.
- 7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.
- 7.4 The Bidder's designated representative is invited to attend a pre-bid meeting, if so **specified in the BDS**. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage. A site visit will be conducted by the Employer at the time of the pre-bid meeting, if so **specified in the BDS**.

- 7.5 The Bidder is requested to submit any questions in writing, to reach the Employer not later than one (1) week before the meeting.
- 7.6 Minutes of the pre-bid meeting, if applicable, including the text of the questions asked by Bidders, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Documents in accordance with ITB 6.3. Any modification to the Bidding Documents that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting. Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.

**8. Amendment of Bidding Documents**

- 8.1 At any time prior to the deadline for submission of Bids, the Employer may amend the Bidding Documents by issuing addenda.
- 8.2 Any addendum issued shall be part of the Bidding Documents and shall be communicated in writing to all who have obtained the Bidding Documents from the Employer in accordance with ITB 6.3. If so **specified in the BDS**, the Employer shall also promptly publish the addendum on the Employer's web page in accordance with ITB 7.1.
- 8.3 To give Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Employer may extend the deadline for the submission of Bids, pursuant to ITB 24.2.

### **C. Preparation of Bids**

**9. Cost of Bidding**

- 9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

**10. Language of Bid**

- 10.1 The Bid, as well as all correspondence and documents relating to the Bid exchanged by the Bidder and the Employer, shall be written in the language **specified in the BDS**. Supporting documents and printed literature that are part of the Bid may be

in another language provided they are accompanied by an accurate translation of the relevant passages in the language of Bid, in which case, for purposes of interpretation of the Bid, such translation shall govern.

**11. Documents  
Comprising the  
Bid**

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

11.2 The Technical Bid submitted by the Bidder shall comprise the following:

- (a) Letter of Technical Bid;
- (b) Bid Security, in accordance with ITB 21;
- (c) Acknowledgment of Compliance with the Guidelines for Procurement under Japanese ODA Loans (Form ACK), which shall be signed and dated by the Bidder's authorized representative;
- (d) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 22.2;
- (e) in the case of a Bid submitted by a JV, a copy of the JV agreement, or letter of intent, signed by all members, to enter into a JV including a draft agreement, indicating at least the parts of the Plant to be executed by the respective members;
- (f) documentary evidence establishing in accordance with ITB 14 that the Works offered by the Bidder in its Bid or in any alternative Bid, if permitted, are eligible;
- (g) documentary evidence in accordance with ITB 15 establishing the Bidder's eligibility and qualifications to perform the Contract if its Bid is accepted;
- (h) Technical Proposal in accordance with ITB 17;
- (i) documentary evidence establishing in accordance with ITB 16 that the Works offered by the Bidder conform to the Bidding Documents;

- (j) alternative Bids, if permissible, in accordance with ITB 13;
- (k) list of Subcontractors, in accordance with ITB 17.2 and 17.3; and
- (k) any other document **required in the BDS**.

11.3 The Price Bid submitted by the Bidder shall comprise the following:

- (a) Letter of Price Bid;
- (b) completed Price Schedules, in accordance with ITB 12 and 18;
- (c) alternative Price Bids, at the Bidder's option and if permissible, in accordance with ITB 13; and
- (d) any other document **required in the BDS**.

## 12. Letters of Bid and Schedules

12.1 The Bidder shall complete the Letters of Technical Bid and Price Bid, including the appropriate Technical and Price Schedules, using the relevant forms furnished in Section IV, Bidding Forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted except as provided under ITB 22.2. All blank spaces shall be filled in with the information requested.

## 13. Alternative Bids

13.1 **The BDS indicates** whether alternative Bids are allowed. If they are allowed, **the BDS will also indicate** whether they are permitted in accordance with ITB 13.3, **or** invited in accordance with ITB 13.2 and/or ITB 13.4.

13.2 When alternatives to the Time for Completion of the whole of the Works or the sections are explicitly invited, a statement to that effect will be **included in the BDS**, and the method of evaluating different time schedules will be described in Section III, Evaluation and Qualification Criteria.

13.3 Except as provided under ITB 13.4 below, Bidders wishing to offer technical alternatives to the Employer's requirements as described in the Bidding Documents must also provide: (i) a price at which they are prepared to offer such alternative meeting the Employer's requirements; and (ii) all information necessary for a complete evaluation of the alternatives by the Employer, including drawings,

design calculations, technical information (particulars), breakdown of prices, and proposed installation methodology and other relevant details. Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the Employer.

- 13.4 When Bidders are **invited in the BDS** to submit alternative technical solutions for specified parts of the Works, such parts shall be described in Section VI, Employer's Requirements. Technical alternatives that comply with the performance and technical criteria specified for the Works shall be considered by the Employer on their own merits, pursuant to ITB 35.2.

**14. Documents  
Establishing the  
Eligibility of  
Plant, Materials  
and Services**

- 14.1 To establish the eligibility of Plant, Materials and Services in accordance with ITB 5, Bidders shall complete the country of origin declarations in the Price Schedule Forms, included in Section IV, Bidding Forms.

**15. Documents  
Establishing the  
Eligibility and  
Qualifications of  
the Bidder**

- 15.1 In accordance with Section III, Evaluation and Qualification Criteria, if the prequalification process was conducted prior to the bidding process, the Bidder shall provide in the corresponding information sheets included in Section IV, Bidding Forms, (i) updated information on any assessed aspect that changed from that time to establish that the Bidder continues to meet the criteria used at the time of prequalification and (ii) the requested information on the additional qualification criteria stated in Section III, Evaluation and Qualification Criteria, or if the assessment of qualification criteria was not conducted prior to the bidding process, the Bidder shall provide the information requested in the corresponding information sheets included in Section IV, Bidding Forms.

- 15.2 Any change in the structure or formation of a Bidder after being prequalified and invited to bid (including, in the case of a JV, any change in the structure or formation of any memberthereto) shall be subject to the written approval of the Employer prior to the deadline for submission of Bids. Such approval shall be denied if (i) such change has not taken place by the free choice of the firms involved; (ii) as a consequence of the change, the Bidder no longer substantially meets the qualification criteria set forth in the Prequalification Documents; or (iii) in the opinion of the

Employer, the change may result in a substantial reduction in competition. Any such change should be submitted to the Employer not later than fourteen (14) days after the date of the Invitation for Bids.

**16. Documents establishing conformity of the Works**

16.1 The documentary evidence of the conformity of the Works with the Bidding Documents may be in the form of literature, drawings and data, and shall include:

- (a) a detailed description of the essential technical and performance characteristics of the Plant, including the Schedule of Guarantees of the proposed Plant, in response to the Employer's Requirement. The Schedule of Guarantees of the proposed Plant shall be stated in the applicable form in Section IV, Bidding Forms;
- (b) a list giving full particulars, including available sources, of all spare parts, special tools, etc., necessary for the proper and continuing functioning of the Plant for the period **specified in the BDS**, following completion of the Works in accordance with the provisions of Contract; and
- (c) adequate evidence demonstrating the substantial responsiveness of the Works to those Employer's Requirements. Bidders shall note that standards for workmanship, materials and equipment designated by the Employer in the Bidding Documents are intended to be descriptive (establishing standards of quality and performance) only and not restrictive. The Bidder may substitute alternative standards, brand names and/or catalog numbers in its Technical Proposal, provided that it demonstrates to the Employer's satisfaction that the alterations are substantially equivalent or superior to the standards designated in the Employer's Requirement.

**17. Technical Proposal, Subcontractors**

17.1 The Bidder shall furnish a Technical Proposal, including a statement of work methods, equipment, personnel, schedule, safety plan, and any other information as stipulated in Section IV, Bidding Forms in sufficient detail to demonstrate substantial responsiveness of the Bidder's proposal to the Employer's Requirements and the completion time.

- 17.2 For major items of the Works as listed by the Employer in Section III, Evaluation and Qualification Criteria, which the Bidder intends to purchase or subcontract, the Bidder shall give details of the name and nationality of the proposed Subcontractors, including manufacturers, for each of those items. In addition, the Bidder shall include in its Technical Proposals information establishing compliance with the requirements specified by the Employer for these items. Bidders are free to list more than one Subcontractor against each item of the Works. Quoted rates and prices will be deemed to apply to whichever Subcontractor is appointed, and no adjustment of the rates and prices will be permitted.
- 17.3 The Bidder shall be responsible for ensuring that any Subcontractor proposed complies with the requirements of ITB 4, and that any Works to be provided by the Subcontractor comply with the requirements of ITB 5 and ITB 16.1.
- 17.4 **Unless otherwise stated in the BDS**, the Employer does not intend to execute any specific elements of the Works by subcontractors selected in advance by the Employer (nominated subcontractors).
- 17.5 In case Prequalification was not conducted prior to the bidding process, Bidders planning to subcontract any of the key activities indicated in Section III, Evaluation and Qualification Criteria, shall clearly identify the proposed specialist subcontractor(s) in Forms ELI-2 and EXP-2(b) in Section IV, Bidding Forms. Such proposed specialist subcontractors(s) shall meet the corresponding qualification requirements specified in Section III, Evaluation and Qualification Criteria.
- In case Prequalification was conducted prior to the bidding process, the Bidder's Bid shall name the same specialist subcontractor(s) whose experience in the key activities was evaluated in the Prequalification, unless such change is explicitly approved by the Employer in accordance with ITB 15.2.

**18. Bid Prices and Discounts**

- 18.1 **Unless otherwise specified in the BDS,** Bidders shall quote for the Works such that the total Bid Price covers all the Contractor's obligations mentioned in or to be reasonably inferred from the Bidding Documents in respect of the design, manufacture, including procurement and subcontracting (if any), delivery, construction, installation and completion of the Works. This includes all requirements under the Contractor's responsibilities for testing, pre-commissioning and commissioning of the plant and, where so required by the Bidding Documents, the acquisition of all permits, approvals and licenses, etc.; the operation, maintenance and training services and such other items and services as may be specified in the Bidding Documents, all in accordance with the requirements of the General Conditions. Items against which no price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed to be covered by the prices for other items.
- 18.2 Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the Bidding Documents.
- 18.3 Bidders shall provide price in each item in the manner and detail called for in the Price Schedules included in Section IV, Bidding Forms. Further, Bidders may add breakdowns of items and provide the prices in each Price Schedule included in Section IV, Bidding Forms.
- 18.4 The price to be offered in the Letter of Bid, in accordance with ITB 12.1, shall be the total **price of the Bid, excluding any discounts that may be offered.**
- 18.5 **Unless otherwise specified in the BDS and the Contract,** the prices offered by the Bidder are subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract. In such a case, the Bidder shall furnish the indices and weightings for the price adjustment formulae in the Schedule of Adjustment Data and the Employer may require the Bidder to justify its proposed indices and weightings.
- 18.6 If so specified in BDS 1.1, Bids are being invited for individual lots (contracts) or for any combination of lots (packages). Bidders wishing to offer discounts for the award of more than one Contract shall specify in their Bid the price reductions applicable to each



package, or alternatively, to individual Contracts within the package. Discounts shall be submitted in accordance with ITB 18.4, provided the Bids for all lots (contracts) are opened at the same time.

18.7 **Unless otherwise provided in the BDS**, all duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date twenty-eight (28) days prior to the deadline for submission of Bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.

18.8 Bidders wishing to offer any unconditional discount shall specify in their Letter of Price Bid the offered discounts and the manner in which price discounts will apply.

## 19. Currencies of Bid and Payment

19.1 The currency(ies) of the Bid shall be, as **specified in the BDS**. Payment of the Contract Price shall be made in the currency or currencies in which the Bid Price is expressed in the Bid of the successful Bidder.

19.2 Bidders may be required by the Employer to justify, to the Employer's satisfaction, their local and foreign currency requirements.

## 20. Period of Validity of Bids

20.1 Bids shall remain valid for the period **specified in the BDS** after the Bid submission deadline date prescribed by the Employer pursuant to ITB 24.1. A Bid valid for a shorter period shall be rejected by the Employer as non-responsive.

20.2 In exceptional circumstances, prior to the expiration of the Bid validity period, the Employer may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. The Bid Security shall also be extended for twenty-eight (28) days beyond the deadline of the extended validity period. A Bidder may refuse the request without forfeiting its Bid Security. A Bidder granting the request shall not be required or permitted to modify its Bid, except as provided in ITB 20.3.

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

- (a) In the case of Fixed Price Contracts, the Contract Price shall be the Bid Price adjusted by the factor **specified in the BDS**.

- (b) In the case of Adjustable Price Contracts, to determine the Contract Price, the fixed portion of the Bid Price shall be adjusted by the factor **specified in the BDS**.
- (c) In any case, Bid evaluation shall be based on the Bid Price without taking into consideration the effect of the corrections indicated above.

## 21. Bid Security

- 21.1 The Bidder shall furnish as part of its Bid a Bid Security in the amount and currency **specified in the BDS**.
- 21.2 The Bid Security shall be a demand guarantee in any of the following forms at the Bidder's option:
  - a) an unconditional guarantee issued by a bank or financial institution (such as an insurance, bonding or surety company);
  - b) an irrevocable letter of credit;
  - c) a cashier's or certified check; or
  - d) another security **specified in the BDS** from a reputable source from an eligible source country. If the unconditional guarantee is issued by an insurance company or a bonding company located outside the Employer's Country, the issuer shall have a correspondent financial institution located in the Employer's Country to make it enforceable. In the case of a bank guarantee, the Bid Security shall be submitted either using the Bid Security Form included in Section IV, Bidding Forms or in another substantially similar format approved by the Employer prior to Bid submission. In either case, the form must include the complete name of the Bidder. The Bid Security shall be valid for twenty-eight (28) days beyond the original validity period of the Bid, or beyond any period of extension if requested under ITB 20.2.
- 21.3 Any Bid not accompanied by a substantially responsive Bid Security shall be rejected by the Employer as non-responsive.
- 21.4 The Bid Security of unsuccessful Bidders shall be returned as promptly as possible upon the Bidder is determined disqualified or in case the Bidder pass the technical evaluation,
- 21.5 The Bid Security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required Performance Security.
- 21.6 The Bid Security may be forfeited:

- a) if a Bidder withdraws its Bid during the period of Bid validity specified by the Bidder on the Letters of Technical Bid and Price Bid, or any extension thereto provided by the Bidder; or
  - b) if the successful Bidder fails to:
    - i. sign the Contract in accordance with ITB 43; or
    - ii. furnish a Performance Security in accordance with ITB 44.
- 21.7 The Bid Security of a JV shall be in the name of the JV that submits the Bid. If the JV has not been legally constituted into a legally enforceable JV at the time of bidding, the Bid Security shall be in the names of all future members as named in the letter of intent referred to in ITB 4.1 and ITB 11.2.

## 22. Format and Signing of Bid

- 22.1 The Bidder shall prepare one original of the Technical Bid and one original of the Price Bid as described in ITB 11 and clearly mark it “TECHNICAL BID - ORIGINAL” and “PRICE BID - ORIGINAL.” Alternative Bids, if permitted in accordance with ITB 13, shall be clearly marked “ALTERNATIVE”. In addition, the Bidder shall submit copies of the Technical and Price Bids, in the number **specified in the BDS** and clearly mark them “COPY.” In the event of any discrepancy between the original and the copies, the original shall prevail.
- 22.2 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as **specified in the BDS** and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Bid where entries or amendments have been made shall be signed or initialed by the person signing the Bid.
- 22.3 In case the Bidder is a JV, the Bid shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives.
- 22.4 Any interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Bid.

## D. Submission and Opening of Bids

**23. Submission, Sealing and Marking of Bids**

23.1 Bidders may submit their Bids by mail or by hand. Procedures for submission, sealing and marking are as follows:

Bidders shall enclose the original of the Technical Bid, the original of the Price Bid, and each copy of the Technical Bid and of the Price Bid, including alternative Bids, if permitted in accordance with ITB 13, in separate sealed envelopes, duly marking the envelopes as “TECHNICAL BID—ORIGINAL,” “PRICE BID – ORIGINAL,” “TECHNICAL BID – COPY,” “PRICE BID – COPY,” and “ALTERNATIVE,” as appropriate. These envelopes containing the original, the copies and the alternative(s), if any, shall then be enclosed in one single envelope. The rest of the procedure shall be in accordance with ITB 23.2 through 23.5.

23.2 The inner and outer envelopes shall:

- (a) bear the name and address of the Bidder;
- (b) be addressed to the Employer in accordance with ITB 24.1; and bear the specific identification of this bidding process specified in BDS 1.1.

23.3 The outer envelopes and the inner envelopes containing the Technical Bid shall bear a warning not to open before the time and date for the opening of Technical Bids, in accordance with ITB 27.1.

23.4 The inner envelopes containing the Price Bid shall bear a warning not to open until advised by the Employer in accordance with ITB 27.7.

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

**24. Deadline for Submission of Bids**

24.1 Bids must be received by the Employer at the address and no later than the date and time **specified in the BDS**.

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

- 25. Late Bids** 25.1 The Employer shall not consider any Bid that arrives after the deadline for submission of Bids, in accordance with ITB 24. Any Bid received by the Employer after the deadline for submission of Bids shall be declared late, rejected, and returned unopened to the Bidder.
- 26. Withdrawal, Substitution, and Modification of Bids** 26.1 A Bidder may withdraw, substitute, or modify its Bid – Technical or Price – after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 22.2, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the Bid must accompany the respective written notice. All notices must be:
- (a) prepared and submitted in accordance with ITB 22 and ITB 23 (except that withdrawals notices do not require copies), and in addition, the respective envelopes shall be clearly marked “WITHDRAWAL,” “SUBSTITUTION,” “MODIFICATION;” and received by the Employer prior to the deadline prescribed for submission of Bids, in accordance with ITB 24.
- 26.2 Bids requested to be withdrawn in accordance with ITB 26.1 shall be returned unopened to the Bidders.
- 26.3 No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of Bids and the expiration of the period of Bid validity specified by the Bidder on the Letter of Technical Bid and on the Letter of Price Bid or any extension thereof.
- 27. Bid Opening** 27.1 Except in the cases specified in ITB 25 and ITB 26, the Employer shall publicly open and read out in accordance with ITB 27.5 all Technical Bids received by the deadline, at the date, time and place **specified in the BDS**, in the presence of Bidders’ designated representatives and anyone who choose to attend. The Price Bids will remain unopened and will be held in custody of the Employer until the time of their opening to be specified in accordance with ITB 27.7.
- 27.2 First, envelopes marked “WITHDRAWAL” shall be opened and read out and the envelope with the corresponding Bid shall not be opened, but returned to the Bidder. No Bid withdrawal shall be

permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at opening of the Technical Bids.

27.3 Second, outer envelopes marked “SUBSTITUTION” shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened and read out. Substitution Price Bid will remain unopened in accordance with ITB 27.1. No envelope shall be substituted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at opening of the Technical Bids.

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

27.5 All other envelopes holding the Technical Bids shall be opened one at a time, reading out:

- a) the name of the Bidder;
- b) whether there is a modification;
- c) the presence or absence of the Bid Security; and
- d) any other details as the Employer may consider appropriate.

Only Technical Bids and alternative Technical Bids read out at Bid opening shall be considered for evaluation. The Employer shall neither discuss the merits of any Bid nor reject any Bid (except for late Bids, in accordance with ITB 25.1).

27.6 The Employer shall prepare a record of the opening of Technical Bids that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification; alternative proposals; and the presence or absence of a Bid

Security. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

27.7 At the end of the evaluation of Technical Bids, the Employer will invite Bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified for award to attend the opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Employer. The opening date should allow Bidders sufficient time to make arrangements for attending the opening.

27.8 The Employer will notify, in writing, Bidders who have been rejected on the grounds of their Technical Bids being substantially non-responsive to the requirements of the Bidding Documents and return their Bid security and Price Bids unopened

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

27.10 All envelopes containing Price Bids shall be opened one at a time, reading out:

- (a) the name of the Bidder;
- (b) whether there is a modification;
- (c) the Bid Price(s), including any discounts and alternative Bids; and
- (d) any other details as the Employer may consider appropriate.

Only Price Bids discounts, and alternative Bids read out and recorded during the opening of Price Bids shall be considered for evaluation. No Bid shall be rejected at the opening of Price Bids.

27.11 The Employer shall prepare a record of the opening of Price Bids

that shall include, as a minimum: the name of the Bidder, the Bid Price, (per lot if applicable), including any discounts, and alternative Bids. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

### **E. Evaluation and Comparison of Bids**

- 28. Confidentiality** 28.1 Information relating to the evaluation of Bids and recommendation of Contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until information on Contract award is communicated to all Bidders in accordance with ITB 42.
- 28.2 Any attempt by a Bidder to influence the Employer in the evaluation of the Bids or Contract award decisions may result in the rejection of its Bid.
- 28.3 Notwithstanding ITB 28.2, from the time of Bid opening to the time of Contract award, if any Bidder wishes to contact the Employer on any matter related to the bidding process, it shall do so in writing.
- 29. Clarification of Bids** 29.1 To assist in the examination, evaluation, and comparison of the Technical and Price Bids, and qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its Bid, giving a reasonable time for a response. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change in the substance of the Technical Bid or prices in the Price Bid, including any voluntary increase or decrease in the prices, shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids, in accordance with ITB 36.
- 29.2 If a Bidder does not provide clarifications of its Bid by the date and time set in the Employer's request for clarification, its Bid may be rejected.



- 30. Deviations, Reservations, and Omissions**
- 30.1 During the evaluation of Bids, the following definitions apply:
- (a) “Deviation” is a departure from the requirements specified in the Bidding Documents;
  - (b) “Reservation” is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Documents; and
  - (c) “Omission” is the failure to submit part or all of the information or documentation required in the Bidding Documents.
- 31. Preliminary Examination of Technical Bids**
- 31.1 The Employer shall examine Technical Bids to confirm that all documents and technical documentation requested in ITB 11.2 have been provided, and to determine the completeness of each document submitted.
- 31.2 The Employer shall confirm that the following documents and information have been provided in the Technical Bid. If any of these documents or information is missing, the Bid shall be rejected.
- (a) Letter of Technical Bid;
  - (b) written confirmation of authorization to commit the Bidder;
  - (c) Bid Security; and
  - (d) Technical Proposal.
- 32. Qualification of the Bidders**
- 32.1 The Employer shall determine to its satisfaction whether Bidders meet the qualification criteria specified in Section III, Evaluation and Qualification Criteria, during the evaluation of Technical Bids. However, if prequalification was carried out prior to the bidding process, the Employer may carry out the assessment of the qualification criteria specified in Section III, Evaluation and Qualification Criteria, for the Bidder who submitted the lowest evaluated and substantially responsive Bid only.
- 32.2 The determination shall be based upon an examination of the documentary evidence of the Bidder’s qualifications submitted by the Bidder, pursuant to ITB 15.

- 32.3 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the Bid, in which event the Employer shall return the unopened Price Bid to the Bidder.

If the assessment of the Bidder's qualification is conducted for the lowest evaluated Bidder only, in accordance with ITB 32.1, and the result of such assessment is negative, the Employer shall proceed to the next lowest evaluated Bid to make a similar determination.

- 32.4 The capabilities of the manufacturers and Subcontractors proposed in its Bid to be used by the Bidder will also be evaluated for acceptability in accordance with Section III, Evaluation and Qualification Criteria. Their participation should be confirmed with a letter of intent between the parties, as needed. Should a manufacturer or Subcontractor be determined to be unacceptable, the Bid will not be rejected, but the Bidder will be required to substitute an acceptable manufacturer or Subcontractor without any change to the Bid Price. Prior to signing the Contract, the corresponding Appendix to the Contract Agreement shall be completed, listing the approved manufacturers or Subcontractors for each item concerned.

**33. Determination of Responsiveness of Technical Bids**

- 33.1 The Employer's determination of a Technical Bid's responsiveness is to be based on the contents of the Bid itself, as defined in ITB 11.2.

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

- (a) if accepted, would:
  - (i) affect in any substantial way the scope, quality, or performance of the the Works specified in the Contract; or
  - (ii) limit in any substantial way, inconsistent with the Bidding Documents, the Employer's rights or the Bidder's obligations under the proposed Contract; or

(b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids.

33.3 The Employer shall examine the technical aspects of the Technical Bid submitted in accordance with ITB 17, in particular, to confirm that all requirements of Section VI, Employer's Requirements have been met without any material deviation, reservation, or omission.

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

**34. Nonmaterial  
Nonconformities**

34.1 Provided that a Technical Bid is substantially responsive, the Employer may waive any nonconformity in the Technical Bid that does not constitute a material deviation, reservation or omission.

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

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

**35. Detailed  
Evaluation of  
Technical Bids**

35.1 The Employer will carry out a detailed technical evaluation of the Bids not previously rejected as being substantially non-responsive, in order to determine whether the technical aspects are in compliance with the Bidding Documents. The Bid that does not meet minimum acceptable standards of completeness, consistency and detail, and the specified minimum (or maximum, as the case may be) requirements for specified Schedule of Guarantees, will be

rejected for non-responsiveness. In order to reach such a determination, the Employer will examine and compare the technical aspects of the Bids on the basis of the information supplied by the Bidders, taking into account the following:

- (a) overall completeness and compliance with the Employer's Requirements; conformity of the Works offered with specified performance criteria, corresponding to each Schedule of Guarantees, as indicated in the Technical Requirements; suitability of the Works offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of any process control concept included in the Bid;
- (b) other relevant factors, if any, listed in Section III, Evaluation and Qualification Criteria.

35.2 Where alternative technical solutions have been allowed in accordance with ITB 13.4, and offered by the Bidder, the Employer will make a similar evaluation of the alternatives. Where alternatives have not been allowed but have been offered, they shall be ignored.

### **36. Correction of Arithmetical Errors**

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

- (a) where there are errors between the total of the amounts given under the column for the price breakdown and the amount given under the Total Price, the former shall prevail and the latter will be corrected accordingly;
- (b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
- (c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to and (b) above.

36.2 Bidders shall be requested to accept correction of arithmetical errors. Failure to accept the correction, in accordance with ITB 36.1, shall result in the rejection of the Bid.

- 37. Conversion to Single Currency** 37.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency as **specified in the BDS.**
- 38. Evaluation of Price Bids** 38.1 The Employer shall use the criteria and methodologies indicated in this Clause. No other evaluation criteria or methodologies shall be permitted.
- 38.2 To evaluate a Price Bid, the Employer shall consider the following:
- a) the Bid Price, excluding Provisional Sums in the Price Schedules, but including Daywork items, where priced competitively;
  - b) price adjustment for correction of arithmetic errors in accordance with ITB 36.1;
  - c) price adjustment due to discounts offered in accordance with ITB 18.7 or ITB 18.9;
  - d) price adjustment due to quantifiable nonmaterial nonconformities in accordance with ITB 34.3;
  - e) converting the amount resulting from applying (a) to (d) above, if relevant, to a single currency in accordance with ITB 37; and
  - f) the evaluation factors indicated in Section III, Evaluation and Qualification Criteria.
- 38.3 If price adjustment is allowed in accordance with ITB 18.7, the estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in Bid evaluation.
- 38.4 If these Bidding Documents allow Bidders to quote separate prices for different lots (contracts), and the award to a single Bidder of multiple lots (contracts), the methodology to determine the lowest evaluated price of the lot (contract) combinations, including any discounts offered in the Letter of Price Bid, is specified in Section III, Evaluation and Qualification Criteria.
- 38.5 If the Bid, which results in the lowest evaluated Bid Price, is seriously unbalanced or front loaded in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Price Schedules, to demonstrate the internal consistency of those prices with the methods and the Price Schedules proposed. After

evaluation of the price analyses, taking into consideration the Schedule of Payment, the Employer may require that the amount of the Performance Security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.

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| <b>39. Comparison of Bids</b>  | 39.1 | The Employer shall compare the evaluated prices of all substantially responsive Bids in accordance with ITB 38.2 to determine the lowest evaluated Bid.   |
| <b>40. Employer's Right to Accept Any Bid, and to Reject Any or All Bids</b> | 40.1 | The Employer reserves the right to accept or reject any Bid, and to annul the bidding process and reject all Bids at any time prior to Contract award, without thereby incurring any liability to Bidders. In case of annulment, all Bids submitted and specifically, Bid Securities shall be promptly returned to the Bidders. |

### **F. Award of Contract**

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| <b>41. Award Criteria</b>        | 41.1 | Subject to ITB 40.1, the Employer shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated Bid and is substantially responsive to the Bidding Documents, provided further that the Bidder is determined to be eligible and qualified to perform the Contract satisfactorily.  |
| <b>42. Notification of Award</b> | 42.1 | Prior to the expiration of the period of Bid validity, the Employer shall notify the successful Bidder, in writing, that its Bid has been accepted. The notification letter (hereinafter and in the Conditions of Contract and Contract Forms called the "Letter of Acceptance") shall specify the sum that the Employer will pay the Contractor in consideration of the execution and completion of the Works (hereinafter and in the Conditions of Contract and Contract Forms called "the Accepted Contract Amount"). |
|                                  | 42.2 | At the same time, the Employer shall also notify all other Bidders of the results of the bidding.  |
|                                  | 42.3 | After a Contract has been determined to be eligible for financing under Japanese ODA Loans, the following information may be made public by JICA: <ul style="list-style-type: none"> <li>(a) name of each Bidder who has submitted a Bid;</li> <li>(b) Bid Prices as read out at Bid opening;</li> <li>(c) name and address of the successful Bidder;</li> <li>(d) name and address of the supplier (if applicable); and</li> <li>(e) award date and amount of the Contract.</li> </ul>                                  |

- 42.4 Until a formal Contract is prepared and executed, the Letter of Acceptance shall constitute a binding Contract.
- 42.5 After notification of award, unsuccessful Bidders may request, in writing, to the Employer a debriefing seeking explanations on the grounds on which their Bids were not selected. The Employer shall promptly respond, in writing, to any unsuccessful Bidders who, after the notification of award in accordance with ITB 42.1, request a debriefing.
- 43. Signing of Contract**
- 43.1 Promptly upon notification, the Employer shall send the successful Bidder the Contract Agreement.
- 43.2 Within twenty-eight (28) days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.
- 44. Performance Security**
- 44.1 Within twenty-eight (28) days of the receipt of the Letter of Acceptance from the Employer, the successful Bidder shall furnish the Performance Security in accordance with the General Conditions of Contract, subject to ITB 38.5, using for that purpose the Performance Security Form included in Section IX Contract Forms, or another form acceptable to the Employer. If the Performance Security furnished by the successful Bidder is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Bidder to be acceptable to the Employer. A foreign institution providing a bond shall have a correspondent financial institution located in the Employer's Country.
- 44.2 Failure of the successful Bidder to submit the above- mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security. In that event the Employer may award the Contract to the next lowest evaluated Bidder whose Bid is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.

## Section II. Bid Data Sheet

A. General	
<b>ITB 1.1</b>	The number of the Invitation for Bids is: CMWSSB/CNT/WSS/ICB/JICA/DESAL/CP01/018/2020-21
<b>ITB 1.1</b>	The Employer/Client is: Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB)
<b>ITB 1.1</b>	The name, identification and number of the lot(s) (contract(s)) comprising this ICB is: Name: Procurement of Design/Engineering, Construction, Commissioning of 400MLD Seawater Reverse Osmosis (SWRO) Desalination Plant at Perur, Chennai with 20 Years of Operation and Maintenance (DBO Basis). Tender No.: CMWSSB/CNT/WSS/ICB/JICA/DESAL/CP01/018/2020-21 Number of the lot(s): 1 No.
<b>ITB 2.1</b>	The Borrower is Government of India (GoI) for Government of Tamil Nadu (GoTN) for Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB)
<b>ITB 2.1</b>	The number of the Loan Agreement is: ID-P267 The amount of a Japanese ODA Loan is JPY 30,000,000,000 (JPY 30 Billion) The signed date of the Loan Agreement is: 29/03/2018
<b>ITB 2.1</b>	The name of the Project is: Project for Construction of Chennai Seawater Desalination Plant (I)
<b>ITB 2.2</b>	The applicable Guidelines for Procurement under Japanese ODA Loans are those published in: <i>April 2012</i>
<b>ITB 3.1(c)</b>	A list of debarred firms and individuals is available at the World Bank's website: <a href="http://www.worldbank.org/debarr">www.worldbank.org/debarr</a>
<b>ITB 4.5</b>	This bidding is subject to prequalification.



<b>B. Bidding Documents</b>	
<b>ITB 7.1</b>	<p>For <b>clarification purposes</b> only, the Employer's address is:</p> <p>Attention: Superintending Engineer (Contracts and Monitoring)</p> <p>Mailing Address: Office of Superintending Engineer (Contracts and Monitoring), Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) Urban Administrative Building, 3<sup>rd</sup> Floor, No.75, Santhome High Road, Raja Annamalaipuram, Chennai 600 028 Telephone: 044 28451300 Ext: 209, Facsimile: 044 28458181 E-mail: <a href="mailto:secandm@cmwssb.in">secandm@cmwssb.in</a></p>
<b>ITB 7.1</b>	Responses to any request for clarification, if any, will be provided through written communication.
<b>ITB 7.1</b>	The bidder may raise the queries upto the pre-bid meeting.
<b>ITB 7.4</b>	<p>A pre-bid meeting will take place at the following date, time and place:</p> <p>Date: xx/xx/xxxx (3 weeks after issue of RFP).</p> <p>Time: xx:00 AM</p> <p>Place: Office of Superintending Engineer (C&amp;M), CMWSSB, Urban Administrative Building, 3<sup>rd</sup> Floor, No.75 Santhome High Road, Raja Annamalaipuram, Chennai 600 028 A site visit can be arranged one week after issue of RFP.</p>
<b>ITB 8.2</b>	Addenda, if any, will be issued to the shortlisted bidders.
<b>C. Preparation of Bids</b>	
<b>ITB 10.1</b>	The language of the Bid is: English.
<b>ITB 11.2 (I)</b>	The Bidder shall submit with its Technical Bid the following additional documents: None
<b>ITB 11.3 (d)</b>	The Bidder shall submit with its Price Bid the following additional documents: None
<b>ITB 13.1</b>	<p>Only one Alternative Bid is permitted in accordance with: ITB13.4</p> <p>The Bidders must also provide:</p> <ul style="list-style-type: none"> <li>(i) a price at which they are prepared to offer such alternative meeting the Employer's requirements; and</li> <li>(ii) all information necessary for a complete evaluation of the alternatives by the Employer, including drawings, design calculations, technical information (particulars), breakdown of prices, and proposed installation methodology and other relevant details.</li> </ul>

	Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the Employer. Alternative technical solutions may be submitted by Bidders without any obligations to accept by the Client.
<b>ITB 13.4</b>	Alternative technical solutions are permitted for the following parts of the Works:  <u>Pre-treatment and RO Systems</u> as further detailed in Section VI, Employer's Requirements.  The evaluation method is as specified in Section III, Evaluation and Qualification Criteria.
<b>ITB 16.1 (b)</b>	The list of spare parts, special tools etc. shall be furnished by the Contractor for two years.
<b>ITB 18.1</b>	Bidders shall quote for the entire Works on a single responsibility basis.
<b>ITB 18.5</b>	The Bid Price shall be adjusted by the following factor: a. Local Currency: As per Schedule of Adjustment Data for local currency b. Foreign Currency: No Adjustment shall be considered
<b>ITB18.7</b>	Evaluated Bid Price (Award Criteria for Contract) will be inclusive of all taxes.  Add the following text to ITB Clause No. 18.7: "The Accepted Contract Amount shall be deemed to include all duties, levies, cess, royalty to Government, GST and other charges imposed on the production, manufacture, sale and transport of the Contractor's Equipment, Plant, Materials and supplies to the construction site to be used on or furnished under the Contract and on the services performed under the Contract. Unless explicitly mentioned in the Contract, Employer doesn't ensure any tax benefits (reduced tax rate/ tax waivers) under Custom Duty, GST, any Cess, etc. during the time of submission of bids. Bidders are advised to consider the actual tax rates (without considering any waiver) while estimating the Contract Price. Any lawful exemption obtained during the contract period the benefit need to be passed on to the Employer.
<b>ITB 19.1</b>	The currency(ies) of the Bid shall be as described below: The unit rates and prices shall be quoted by the Bidder in the Price Schedule separately in the following currencies: (i) For those inputs to the Works that the Bidder expects to supply from within the Employer's country, in Indian Rupees (INR), and further referred to as "the local currency"; and (ii) For those inputs to the Works that the Bidder expects to supply from outside the Employer's country (referred to as "the foreign currency requirements"), in USD.
<b>ITB 20.1</b>	The Bid validity period shall be 180 days.
<b>ITB 20.3 (a)</b>	The Bid Price shall be adjusted by the following factor: NIL
<b>ITB 20.3 (b)</b>	The fixed portion of the Bid Price shall be adjusted by the factor: NIL

<b>ITB 21.1</b>	<p>Bid must be accompanied by Bid Security as specified below:</p> <p>An absolute, unconditional and irrevocable Bank Guarantee in the name of The Managing Director, Chennai Metropolitan Water Supply and Sewerage Board for an amount of INR 14,00,00,000 (Indian Rupees Fourteen Crores only)</p>
<b>ITB 21.2 (a)</b>	The Bid Security only in the form of BG shall be submitted from the Scheduled Banks listed under Reserve Bank of India, preferably having branch in Chennai
<b>ITB 21.2 (b), (c) and (d)</b>	Not Applicable
<b>ITB 21.7</b>	<p>The Bid Security can be submitted by the single bidder, a Lead Member or any Member on behalf of the bidder.</p> <p>Employer will get an absolute, unconditional irrevocable Bank Guarantee submitted for Bid Security verified from the bank. In case the verification reveals that the submitted Bank Guarantee is fraudulent, Employer reserves the right to reject the bid.</p>
<b>ITB 22.1</b>	In addition to the original of the Bid, the number of copies is: <b>Two Copies</b> , clearly marking the Original and Copies; <b>and one soft copy in the form of CD/DVD/Pen Drive.</b>
<b>ITB 22.2</b>	The written confirmation of authorization to sign on behalf of the Bidder shall consist of: Original Power of Attorney (legally valid).
<b>D. Submission and Opening of Bids</b>	
<b>ITB 24.1</b>	<p>For <b>Bid submission purposes</b> only, the Employer's address is:            Attention: Superintending Engineer (Contracts and Monitoring)            Mailing Address:            Office of Superintending Engineer (Contracts and Monitoring),            Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB)            Urban Administrative Building, 3<sup>rd</sup> Floor, No.75 Santhome High Road,            Raja Annamalaipuram, Chennai 600 028E-mail: <a href="mailto:secandm@cmwssb.in">secandm@cmwssb.in</a></p> <p><b>The deadline for Bid submission is:</b></p> <p>Date: xx/xx/2021            Time: xx:00 PM</p>
<b>ITB 27.1</b>	<p>The Technical Bid opening shall take place at:            Office of Superintending Engineer (Contracts and Monitoring),            Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB)            Urban Administrative Building, 3<sup>rd</sup> Floor, No.75 Santhome High Road,            Raja Annamalaipuram, Chennai 600 028</p> <p>E-mail: <a href="mailto:secandm@cmwssb.in">secandm@cmwssb.in</a></p> <p>Date: xx/xx/2021            Time: xx:00 PM</p>

<b>E. Evaluation, and Comparison of Bids</b>	
<b>ITB 34</b>	Not Applicable
<b>ITB 37.1</b>	<p>The currency that shall be used for Bid evaluation and comparison purposes to convert all Bid Prices expressed in various currencies into a single currency is: Indian Rupees (INR)</p> <p>The source of exchange rate shall be: Reserve Bank of India.</p> <p>The date for exchange rate shall be the date 28 days prior to the date of technical bid opening specified in ITB 27.1.</p>
<b>ITB 38.2 (a) &amp; (d)</b>	Not Applicable
<b>ITB 43.2</b>	<p>This clause is modified as follows: Within fourteen (14) days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer on fulfilling the conditions as per ITB 44.</p> <p>The Time period for signing the Contract agreement shall be within 14 days after receipt of Performance Security from the successful bidder, along with the registered JV Agreement, in case of JV. The costs of stamp duties and similar charges imposed by the law in connection with entry into the Contract Agreement shall be borne by the JV.</p>
<b>ITB 43</b>	<p>The following clause is added as ITB 43.3: The successful Bidder in case of JV, shall register the JV agreement in Chennai as per the prevailing Registration Act, Rules and Conditions, Registration Department after the issue of the Letter of Acceptance and before execution of the Agreement so as to be legally valid and binding on JV members; and the registration fee required for the registration of the JV agreement should be borne by the Bidders, which will not be reimbursed by the Employer to the Bidder as early as possible from the date of issue of Letter of Acceptance, not later than 28 days, without any effect on the project duration and the respective Milestones defined in Clause No.1.13 of Part-II. The JV members shall have to establish an office in Chennai, if the JV is awarded with the Contract to facilitate the completion of above-mentioned registration formalities in Chennai.</p> <p>Delay in the registration of JV agreement will not be a ground for the Contractor to claim any extension of time or additional cost.</p>
<b>ITB 44</b>	<p>The following clause is added as ITB 44.3: The Performance Security shall be furnished as follows:</p> <ul style="list-style-type: none"> <li>For the Design Build Contract, the same shall be furnished within 28 days of the issue of Letter of Acceptance, as defined in Sub-Clause 4.2, Particular Condition (PC)- Part A – Contract Data, Part-III.</li> <li>For the O&amp;M Contract for 20 years, the same shall be furnished within 28 days from the commencement of Operation Service Period.</li> </ul>

## **Section III. Evaluation and Qualification Criteria**

## **Qualification Criteria**

### **(I) Qualification of the Applicant but not that of the Applicant's Affiliate**

It is the legal entity or entities comprising the Applicant (which is/are party to the Applicant under a JV), and not the Applicant's parent company(ies), group companies, subsidiaries, or other affiliates, that must satisfy the qualification criteria. However, the legal entity can claim the experience of their subsidiary/SPV only under the following circumstances:

- a) If a project was awarded to any of the constituent company of the Applicant and later on that company incorporates a wholly-owned subsidiary (executing entity) for the execution of said project, then the experience of that executing entity can be claimed by the parent company based on the documentary evidence supporting the above.
- b) In SPVs formed for a specific PPP project, involving a constituent of the Applicant, the relevant experience of such SPV can be claimed by the participating entity. However, the lead partner (The majority shareholder) shall be given 100% experience credit while other partners in SPV shall be given experience in the proportion to their percent share in SPV relative to the share of lead partner. However, if the SPV applies on its own as an Applicant then the members of SPV cannot participate in the Bid.

### **(II) Exchange Rate for Qualification Criteria**

Wherever a Form in Section IV, Application Forms, requires the Applicant to state a monetary amount, the Applicant should indicate the USD equivalent using the rate of exchange determined as follows:

- (a) For turnover or financial data required for each year- Exchange rate prevailing on the last day of the respective calendar or fiscal year, as applicable.
- (b) Value of single contract- Exchange rate prevailing on the date of the contract.

The applicable exchange rate shall be determined as follows:

The source of exchange rate shall be: Reserve Bank of India

In case, the exchange rates are not available in the source identified above, the rates shall be taken from any other publicly available source acceptable to the Employer. Any error in determining the exchange rates may be corrected by the Employer.

### **(III) Qualification Criteria for Award of Multiple Lots:**

N/A

## Evaluation and Qualification Criteria

### 1. Evaluation

#### 1.1 Technical Evaluation

In addition to the criteria listed in ITB 35.1 (a) – (b) the following factors shall apply:

##### 1.1.1 Personnel

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

No.	Position	Minimum Qualification	Min. Total Experience (Years)	Experience in Similar Works (Years)	Number Reqd.
1	Construction Project Manager	Post-Graduate in Civil Engineering	20	10	1
2	Deputy Construction Project Manager	Graduate in Civil Engineering	15	10	2
3	Engineering Manager (Lead Design & Technical Engineer)	Post-Graduate Degree in Mechanical (1) and Electrical (1) Engineering	15	10	2 (one each)
4	Sr. Quality Assurance / Quality Control Engineer	Graduate in any Engineering Discipline	8	4	2
5	Health & Safety Engineer (Accident Prevention officer)	Diploma in construction safety accredited by BSS / Certified	5	3	2
6	Lead Process Design (Reverse Osmosis)	Graduate in Civil/Chemical/ Mechanical Engineering	15	10	1
7	Environmental Expert	Post-Graduate in Environmental Engineering / Science	10	5	1

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

### 1.1.2 Equipment

No.	Equipment Type and Characteristics	Minimum Number required
1	Crane or Hydra (10 ton)	4
2	Loader cum Back hoe (0.7m <sup>3</sup> )	4
3	Excavators (1m <sup>3</sup> )	4
4	Tipper / Dumper Trucks (10 ton)	4
5	D G Set (125 kVA)	3
6	Batching Plant	2

The Bidder must demonstrate that he can mobilise key construction equipment and facilities listed hereafter, but not limited to: The equipment may be owned or leased.

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

### 1.1.3 Others

NIL

## 1.2 Economic Evaluation

Any adjustments in price that result from the procedures outlined below shall be done, for purposes of comparative evaluation only, to arrive at an “Evaluated Bid Price”. Bid Prices quoted by Bidders shall remain unaltered.

The criteria listed in ITB 38.2 (a) – (c) are applicable. The Clause ITB 34.3 and ITB 38.2 (d) are not applicable. Apart from these the following criteria shall apply.

### 1.2.1 Other Factors

The following factors and methods will apply under ITB 38.2 (f):

#### (a) Operating and Maintenance Costs

The operation and maintenance costs factors for calculation of the life cycle cost are:

- (i) Number of years for life cycle Twenty (20) years of operation and maintenance including one year of Defect liability Period.
- (ii) Annual Operation & Maintenance costs [as per the priced Price Schedules of the Bidder, including cost of spare parts for the one year of Operation and Maintenance.]
- (iii) a rate of 8% (eight percent), to be used to discount to present value all annual future costs calculated under(ii) above for the period specified in (i).



## **METHODOLOGY FOR BID EVALUATION**

Under Clause 38 of ITB, the bid price for Capital and O&M costs shall be used and the following Methodology will be adopted to find the lowest evaluated cost of the plant. Only Price Bids of Technically Qualified bidders shall be evaluated.

### **a) Determination/Evaluation of Capital Cost**

Total cost of the 400 MLD seawater desalination plant will be evaluated based on technical requirements quoted by each Bidder.

### **b) Determination/Evaluation of O&M Cost of Plant**

The procedure for evaluation of Operation Cost of Plant is as follows,

- The Bidder shall indicate the no. of units (kWh/m<sup>3</sup>) of specific electrical energy consumption required for guaranteed performance of the Seawater Desalination Plant for full throughput. Electrical energy cost within the quoted electrical energy consumption will be paid by the Employer directly.
- The Bidder shall quote O&M Cost for each year of the O & M period of twenty (20) years.

The Net Present Value (NPV) for all the O&M Cost shall be calculated by the Employer for twenty (20) years of O & M. Additionally, for the electrical energy consumption NPV shall be calculated for twenty (20) years of O & M for comparison of different bids.

Based on the equipment selected, the Bidder shall provide net annual guaranteed power consumption during operation and maintenance. This net annual guaranteed power consumption (kWh) shall be multiplied by the current rate of electricity charges (charges shall be taken at INR 6.35 per kWh and Rs 350 per kVA as fixed demand charges for the purpose of evaluation) and shall be added to the overall annual operation and maintenance cost provided by the Bidder including the cost of spare parts for a year; which then will be used to determine Net Present Value (NPV) (O&M) for the total duration of O&M including DLP period.

This O&M NPV cost inclusive of power cost calculated as per procedure stipulated above will be added to the cost for Design-Build to obtain the Evaluated Bid Price to determine the award of contract. The Bidder quoting the lowest Evaluated Bid Price will be awarded the contract.

- The discounting rate of 8% per annum to be taken for (NPV) calculations.

**c) Final Determination of bids**

- Computed evaluated capital cost plus net present value of O&M shall be considered to determine the lowest evaluated bid.

Mathematically, this may be represented as follows:

For a series of future payments, the total net present value from 1 to n years would be calculated as:

$$NPV_{O\&M} = \sum_{t=1}^{t=n} (X_t / (1+i)^t)$$

where

t= time in years up to end of the contract period

i= discount rate

X= net cash inflow during the period including the power cost

**Evaluated Bid Price** = Design Build Cost +  $NPV_{O\&M}$

**1.2.2 Award Criteria for Multiple Contracts (ITB 38.4)**

Not Applicable

**1.3 Alternative Completion Times**

Not Used

**1.4 Alternatives Technical Solutions**

Alternatives technical solutions, if invited in accordance with ITB 13.4, will be evaluated as follows:

Bidders may propose **only one alternative process solutions** for only pre-treatment and RO system of the seawater desalination plant and submit an alternative technical bid in a separate envelope marked clearly as “**ALTERNATIVE TECHNICAL BID**” along **with the Base Technical Bid** as per the Employer’s proposed processes. Bidders must provide proper justification for the alternative process selection in terms of the technical and economic advantages demonstrated by the lower capital and operational costs. In that case the Bidder shall provide a detailed comparative study of his alternative technical solution with the Employer’s proposed processes. Along with alternative technical bid, the Bidder shall also submit alternative price bid in separate sealed envelope marked as “**ALTERNATIVE PRICE BID**” along with the alternative technical bid.

For the alternative bid, the Bidders must provide:

- (i) a price at which they are prepared to offer such alternative technologies meeting the Employer's requirements; and
- (ii) all information in the alternative technical bid necessary for a complete evaluation of the alternatives by the Employer, including drawings, design calculations, technical information (particulars), breakdown of differential in price between Base and Alternative technologies proposed installation methodology and other relevant details.

Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the base technical requirements shall be considered by the Employer.

The viability of the alternative technical bids for 400 MLD SWRO plant shall be evaluated by the Employer's Representatives. The acceptance of the alternative technical bid is solely on the discretion of the Employer and Bidder shall not be allowed to further discuss on this, if it is not selected for any reason thereof. In case the alternative technical bid of the lowest evaluated Bidder is accepted by the Employer, the Bidder will be informed accordingly and in that case, the alternative bid price with price negotiation shall become the Bidder's Bid Price for contractual purpose.

## 2. Qualification

### (i) Exchange Rate for Qualification Criteria

Wherever a Form in Section IV, Bidding Forms, requires a Bidder to state a monetary amount, Bidders should indicate the USD equivalent using the rate of exchange determined as follows:

- (a) For turnover or financial data required for each year - Exchange rate prevailing on the last day of the respective calendar year or fiscal year, as applicable.
- (b) Value of single Contract - Exchange rate prevailing on the date of the Contract.

Exchange rates shall be taken from the publicly available source **identified in BDS 37.1** or in case such rates are not available in the source identified above, any other publicly available source acceptable to the Employer. Any error in determining the exchange rates may be corrected by the Employer.

## 2.1 Eligibility

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Factor	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
2.1.1	Nationality	Nationality in accordance with ITA 4.4.	Must meet requirement	N/A	Must meet requirement	N/A	Forms ELI –1 and 2 <sup>(i)</sup> with attachments
2.1.2	Conflict of Interest	No conflicts of interests in ITA 4.2 and 4.3.	Must meet requirement	N/A	Must meet requirement <sup>(ii)</sup>	N/A	Application Submission Form
2.1.3	JICA Ineligibility	Not having been declared ineligible by JICA as described in ITA 4.5.	Must meet requirement	N/A	Must meet requirement <sup>(ii)</sup>	N/A	Application Submission Form Form ACK
Note for the Applicants:							
(i) ELI – 2 is required only if the Applicants is a JV.							
(ii) This requirement also applies to subcontractors if proposed by the Applicant under 4.2(b) below.							

**2.2 Historical Contract Non-Performance and Litigation**

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Factor	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
2.2.1	<b>History of non-performing Contracts</b>	Non-performance of a contract <sup>(i)</sup> did not occur as a result of contractor's default since 1 <sup>st</sup> January 2015.	Must meet requirement <sup>(ii)</sup>	N/A	Must meet requirement <sup>(ii)</sup>	N/A	Form CON
2.2.2	<b>Pending Litigation</b>	Applicant's financial position and prospective long-term profitability still sound according to criteria established in 3.1 below and assuming that all pending litigation will be resolved against the Applicant.	Must meet requirement <sup>(ii)</sup>	N/A	Must meet requirement <sup>(ii)</sup>	N/A	Form CON
2.2.3	<b>Litigation History</b>	No consistent history of court orders <sup>(iii)</sup> against the Applicant since 1 <sup>st</sup> January 2015.	Must meet requirement <sup>(ii)</sup>	N/A	Must meet requirement <sup>(ii)</sup>	N/A	Form CON
<b>Notes for the Applicants.</b> (i) Non-performance, as decided by the Employer, shall include all contracts: (a) where non-performance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) that were so challenged but fully settled against the contractor. Non-performance shall not include contracts where Employer's decision was overruled by the dispute resolution mechanism.							

Eligibility and Qualification Criteria			Compliance Requirements			Documentation	
No.	Factor	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
<p>Moreover, non-performance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the applicant have been exhausted.</p> <p>(ii) This requirement also applies to contracts executed by the Applicant as a JV member.</p> <p>(iii) The Applicant shall provide accurate information on the related Application Form about any litigation resulting from contracts completed or ongoing under its execution over the last five (5) years. A consistent history of court orders against the Applicant or any member of a joint venture may result in failure of the Application.</p>							

### 2.3 Financial Situation and Capabilities

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Factor	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
2.3.1	Financial Performance	The financial statements (audited balance sheets) for the last five (5)years shall be submitted and must demonstrate the current soundness of the Applicant’s financial position and indicate its prospective long-term profitability.					
		A)As the minimum requirement, i) Applicant’s total profit after tax (PAT) in the last 3 (three) years is not negative.	Must meet requirement	N/A	Must meet requirement	N/A	Form FIN – 1 with attachments
		ii) Applicant’s profits after tax (PAT) in any 2 (two) consecutive years during the last 5 (five) years are not negative.	Must meet requirement	N/A	Must meet requirement	N/A	Form FIN – 1 with attachments
		B)As the minimum requirement, Applicant’s net worth calculated as the difference between total assets and total liabilities should be positive during the last five (5) years.	Must meet requirement	N/A	Must meet requirement	N/A	Form FIN – 1 with attachments

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Factor	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
2.3.2	Average Annual Turnover	Minimum average annual turnover of USD 325 million, calculated as total certified payments received for contracts in progress and/or completed, within the last 5 years divided by 5 years. The average annual turnover includes Construction, Equipment & O&M Turnover	Must meet requirement	Must meet requirement	Must meet not less than 25% of the requirement	Lead member in JV must meet not less than 50% of the requirement	Form FIN –2
2.3.3	Financial Capabilities	A) The Applicant shall demonstrate, to the satisfaction of the Employer that it currently (as of the Application submission deadline), has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction cash flow requirements estimated as amount in USD 62 million for	Must meet requirement	Must meet requirement	N/A	N/A	Form FIN– 3 and FIN-4



Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Factor	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
		the subject contract(s) net of the Applicant’s all other commitments, both current and future.					
		<p>B) The Applicant should have a minimum available bid capacity of USD 650 million consisting of executing capacity and existing commitments.</p> <p>Available Bid Capacity = <math>A \times N \times M - B</math>, where <math>A</math>=Max value of works executed during one financial year in the last five years.</p> <p><math>N</math>= Number of years prescribed for completion of the works for which bids are invited=Three and half years/Forty two months <math>M=2.5</math></p>	Must meet requirement	Must meet requirement	Must meet not less than 25% of the requirement	Lead member in JV must meet not less than 50% of the requirement	Form FIN– 2 and FIN-4

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Factor	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
		B=value of the existing commitments in all ongoing Engineering works (excluding O&M cost) to be completed during the next three years.  Note: Price for previous financial years shall be updated to the present price level @ 5% p.a.					
2.3.4	Financial Performance (Insolvency)	The Applicant should not be currently in the process of financial restructuring under Corporate Debt Restructuring (CDR) i.e. at the time of the bids submission and up till the contract award (in case the applicant is chosen for contract award).	Must meet requirement	N/A	Must meet requirement	N/A	Form FIN – 5
<b>Notes for the Applicants</b> (i) Management Contractor is DELETED. (ii) Summation of number of small sized contracts (less than the size specified under requirement) to meet the overall requirement will not be accepted. (iii) Completion shall be evidenced by submission of performance certificate from the owner of the project such as Taking-over Certificates and Completion Certificates as required to be submitted as attachment to Form EXP-1, Form EXP-2(a), Form EXP-2(b), EXP – 2(c) and EXP –2(d) of Section IV, Application Forms.							

Eligibility and Qualification Criteria			Compliance Requirements			Documentation	
No.	Factor	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
<p>(iv) The lead partner shall be given 100% experience credit while other JV partners shall be given experience in the proportional to their percent share in JV relative to the share of lead partner.</p> <p>(v) In determining whether the JV meets the requirement of total number of contracts, only the number of contracts completed by all members, each of size equal or more than the minimum size required, shall be aggregated.</p> <p>(vi) The lead partner shall be given 100% experience credit while other JV partners shall be given experience in the proportional to their percent share in JV relative to the share of lead partner.</p> <p>(vii) Operation &amp; Maintenance experience shall be counted from actual date of commissioning of the Plant. Operation &amp; Maintenance carried out during defect liability period shall also be considered as a part of O&amp;M requirement for Clause 4.2 (d) above.</p> <p>(viii) The applicant shall submit performance certificate from the owner of the project for successful completion in specific construction experience as of application submission date: for Clauses 4.1 and 4.2. All experience certificates to be provided with English translation shall be identified, as true translated copies of the original, by a duly certified / authorized / qualified Translator, supported by the affidavit of the said Translator, certifying the correctness of the English translation.</p> <p>All the document originating outside the Republic of India such as work experience certificate(s), financial detail(s) etc. should be self-attested by the authorised signatory of the Applicant.</p> <p>However, in case of certificates/financial data originated within India, the same needs to be duly notarized.</p>							

## **2.4 Manufacturers**

In the case of a Bidder who offers to supply and install major items of the Works under the Contract that the Bidder did not manufacture or otherwise produce, the Bidder shall provide the manufacturer's authorization, using Form MAN provided in Section IV, Bidding Forms, showing that the Bidder has been duly authorized by the manufacturer or producer of the related plant and equipment or component to supply and/or install that item in the Employer's country. The Bidder is responsible for ensuring that the manufacturer or producer complies with the requirements of ITB 4 and ITB 5 and meets the minimum criteria listed above for that item.

## **Section IV. Bidding Forms**

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## LETTER OF TECHNICAL BID

Date: *[insert date of Bid submission]*

Loan Agreement No.: *[insert number]*

IFB No.: *[insert number]*

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

To: *[insert full name of Employer],*

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB 8): *[insert the number and issuing date of each Addendum]*;
- (b) We, *including* any Subcontractors/ manufacturers, for any part of the Contract, meet the eligibility requirements in accordance with ITB 4 and ITB5;
- (c) We, including any Subcontractors/ manufacturers, for any part of the Contract, have no conflict of interest in accordance with ITB4;
- (d) We offer to *[insert the services that apply, i.e., design, manufacture, test, deliver, install, pre-commission and commission]*, in conformity with the Bidding Documents, the following Works: *[insert a brief description of the Works]*;
- (e) Our Bid shall be valid for a period of *[specify the number of calendar days]* days from the date fixed for the Bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (f) We are *not* participating, as a Bidder or as a Subcontractor/ manufacturers, in more than one Bid in this bidding process in accordance with ITB 4.2 (c), other than alternative Bids submitted in accordance with ITB 13; and
- (g) We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in any type of fraud and corruption.

Name of the Bidder\**[insert complete name of the Bidder]*

Name of the person duly authorized to sign the Bid on behalf of the Bidder\*\* *[insert complete name of person duly authorized to sign the Bid]*

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

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

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

\*: In the case of the Bid submitted by a Joint Venture specify the name of the Joint Venture as Bidder

\*\*: Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid.



## LETTER OF PRICE BID

Date: *[insert date of Bid submission]*

Loan Agreement No.: *[insert number]*

IFB No.: *[insert number]*

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

To: *[insert full name of Employer]*,

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB 8): *[insert the number and issuing date of each Addendum]*;
- (b) We offer to *[insert the services that apply, i.e., design, manufacture, test, deliver, install, pre-commission and commission]*, in conformity with the Bidding Documents, the following Works: *[insert a brief description of the Works]*;
- (c) The total price of our Bid, excluding any discounts offered in item (d) below is:  
  
In case of only one lot, total price of the Bid *[insert the total price of the Bid in words and figures, indicating the various amounts and the respective currencies]*  
  
*[In case of multiple lots, insert the total price of each lot]*  
*[In case of multiple lots, insert the total price of all lots (sum of all lots)]*;
- (d) The discounts offered and the methodology for their application are: The discounts offered are: *[specify in detail each discount offered]*  
  
The exact method of calculations to determine the net price after application of discounts is shown below: *[specify in detail the method that shall be used to apply the discounts]*;
- (e) Our Bid shall be valid for a period of *[specify the number of calendar days]* days from the date fixed for the Bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (f) If our Bid is accepted, we commit to obtain a Performance Security in accordance with the Bidding Documents.
- (g) We understand that this Bid, together with your written acceptance thereof included in your Letter of Acceptance, shall constitute a binding Contract between us, until a formal Contract is prepared and executed; and
- (h) We understand that you are not bound to accept the lowest evaluated Bid or any other Bid that you may receive.

Name of the Bidder\*[*insert complete name of the Bidder*]

Name of the person duly authorized to sign the Bid on behalf of the Bidder\*\* [*insert complete name of person duly authorized to sign the Bid*]

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

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

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

\*: In the case of the Bid submitted by a Joint Venture specify the name of the Joint Venture as Bidder

\*\*: Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid.

## SCHEDULE OF ADJUSTMENT DATA

### LOCAL CURRENCY

*[In this Table A, the Employer shall indicate the necessary information in columns (a), (b) and (c), and shall also provide a fixed value in A and a range of values in B, C, D, and E of column (d). For very large and/or complex works contracts, it may be necessary to specify several families of price adjustment formulae for the different works involved and to prepare the corresponding adjustment tables.]*

(a)	(b)	(c)	(d)	(e)
Index code	Index description	Source of index	% Range of Weighting	Bidder's Proposed weighting
	A. Nonadjustable (including plant & machineries, all equipment and pipes)	Consumer Price Index for Industrial Workers published by Ministry of Labour, Govt. of India.	50	A: 50
	B. Labour	Wholesale Price Index published by Ministry of Commerce & Industry, Govt. of India for following:	10-20	B:
	C. Cement (All types)	a) Cement- Ordinary Portland Cement	10-20	C:
	D. Steel	b) Steel- MS Bright bars	15-25	D:
	E. Fuel & Lubricants	Fuel & lubricants- Rates charged by Indian Oil Corporation at Chennai.	5 -10	E:
<b>Total</b>				<b>100</b>

The Bidder shall fill in column (e) and specify a value within the ranges given by the Employer in B, C, D & E of column (e), so that the total weighting equals 1.00.

The base index will be considered for the quarter in which financial bids are opened.

## **PRICE SCHEDULES**

**INCLUDED SEPARATELY AS PART-1(A)**

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## **SCHEDULE OF PAYMENT**

*[If the Contract includes a Schedule of Payment specifying the instalments in which the Contract Price will be paid, specify and describe the plan of Payment in conformity with Price Schedule. For the details, refer to GC 14. 4 of PART-III]*

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## TECHNICAL PROPOSAL<sup>1</sup>

*[List the items comprising Technical Proposal. Typical items are as following;]*

- Technical Schedules
- Method Statement
- Site Organisation
- Operation and Maintenance (O&M) Plan
- Personnel
- Contractor's Equipment
- Spare Parts
- Proposed Subcontractors for Major Items of Plant Design, Supply and Installation Services
- *[Others]*

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<sup>1</sup> As other conceivable items, "Training program for operating staff", "Description of the technology" or "Procedure for carrying or test on completion, including commissioning and trial operation" can be considered from the nature of the Contract.

## **TECHNICAL SCHEDULE-1- CONSTRUCTION PROGRAMME**

The Bidder shall submit a realistic construction programme which he proposes to adopt for executing the Works. This shall be in sufficient detail so as to show the order and duration of key activities required to carry out the Works (including each stage of mobilization of labour, setting up of site offices/ workshops/ consents and approvals, procurement, manufacture, pre-delivery inspection and testing, delivery to Site, construction, erection, testing and commissioning).

The Bidder should pay particular attention to ensuring that the proposed programme is integrated with the Method Statement.

The construction programme shall be developed and presented on a commercially available project management software (such as Primavera, MS Project or equivalent), together with bar charts and CPM diagrams which clearly illustrate the critical path to achieve the desired results.

**TECHNICAL SCHEDULE-2-PROPOSED PLANT DETAILS****(To be completed by the Bidder)**

The Technical Schedules are given below which are to be filled by the Contractor. This will be used for Evaluation of the Technical bids. All columns and rows are to be filled. For any other additional information, please create row in the specific section and insert the information. Please read the technical specifications in Part 2 before filling the Schedules.

**1.0 Intake Works**

Sl. No.		Items – for 400 MLD Plant	Unit	Description for 2x200 MLD items
(a)		<b>Sea Water Intake System</b>		
	i)	Design Capacity of total offshore intake	MLD	
	ii)	Sea Water Offshore intake pipe details <ul style="list-style-type: none"> <li>• MOC</li> <li>• No. of Pipes and Screen Head (2 pipes and heads required)</li> <li>• Length of Intake pipe from seashore</li> <li>• Pipe thickness (pressure rating)</li> </ul>		
	iii)	Offshore Velocity Cap Type Head <ul style="list-style-type: none"> <li>• Head Diameter</li> <li>• Height above seabed</li> <li>• Height below seabed</li> <li>• MOC</li> </ul>		
	iv)	Offshore Screen <ul style="list-style-type: none"> <li>• No. of screens</li> <li>• Size (Opening)</li> <li>• Height</li> <li>• MOC (<i>Super Duplex Steel required</i>)</li> <li>• Velocity Cap type Head Diameter</li> <li>• Velocity of Water at screen</li> <li>• Max head loss across bar screen</li> </ul>		
	v)	Seawater Intake Well	(m x m x m)	



Sl. No.		Items – for 400 MLD Plant	Unit	Description for 2x200 MLD items
		<ul style="list-style-type: none"> <li>• Dimension of the Well</li> <li>• MOC of Well</li> <li>• Chambers in the Well (<i>min 2 Chambers required</i>)</li> <li>• Type of gates used (<i>Sluice gates required – stop logs not acceptable</i>)</li> <li>• MOC of gates</li> <li>• Bottom level in Chart Datum</li> <li>• Seawater level in the Well (min/average/max)</li> </ul>		
	vi)	Pigging System <ul style="list-style-type: none"> <li>• Dimension of the Pig</li> <li>• MOC of Pig</li> <li>• No. of Pigs</li> <li>• Pumps Details (flow, press) for the Pigging System</li> <li>• MOC of pumps</li> </ul>		
(b)		<b>Sea Water Outfall System</b>		
	i)	Design Capacity of total offshore Outfall	MLD	
	ii)	Sea Water Offshore Outfall pipe details <ul style="list-style-type: none"> <li>• MOC</li> <li>• No. of Pipes</li> <li>• Length of Outfall pipe from seashore</li> <li>• Pipe thickness (pressure rating)</li> </ul>		
	iii)	Offshore Diffuser <ul style="list-style-type: none"> <li>• No. of Diffusers</li> <li>• Size (Opening)</li> <li>• MOC</li> <li>• Distance between diffusers</li> <li>• Max Velocity</li> </ul>		

Sl. No.		Items – for 400 MLD Plant	Unit	Description for 2x200 MLD items
	iv)	Outfall Tank <ul style="list-style-type: none"> <li>• Dimension of the tank</li> <li>• MOC of tank</li> <li>• Chambers in the tank</li> <li>• Type of gates used</li> <li>• MOC of gates</li> </ul>		
(c)		<b>Travelling Band Screens (Onshore)</b>		
	i)	Total Quantity (Working + Standby)	Nos.	
	ii)	Capacity of Each Screen	MLD	
	iii)	MOC of the Screen		
	iv)	Mesh width	mm	
	v)	Flow rate for screen cleaning	m3/hr	
(d)		<b>Sea Water Intake Pumps</b>		
	i)	Type of pump		
	ii)	Total Quantity (working + standby)	Nos.	
	iii)	Capacity of each Pump	m3/hr	
	iv)	Materials of Construction <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>	-	
	v)	Performance criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		

**2.0 Pre-treatment**

*Any additional information is to be given such as alternate technology. Please create space below the table and insert the information.*

*Following items shall be provided for each stream of 200 MLD.*

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for 200 MLD items
<b>a)</b>		<b>Hypo Storage and Dosing System</b>		
	i)	Chemical dosage (range)	mg/l	
	ii)	Number of dosing Tanks	No.	
	iii)	Capacity of dosing tanks	m <sup>3</sup>	
	iv)	Material of dosing tank		
	v)	Number of dosing pumps (Working + Standby)	Nos.	
	vi)	Type of dosing pumps		
	vii)	Material of dosing pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	viii)	Capacity of dosing pump	LPH@ MWC	
	ix)	Days of chemical storage ( <i>min 30 days</i> )	days	
	x)	Size of the storage tank	m <sup>3</sup>	
	xi)	Material of storage tank		
	xii)	Number of transfer pumps (Working + Standby)	Nos.	
	xiii)	Type of transfer pumps		
	xiv)	Material of transfer pumps		
	xv)	Capacity of transfer pump	LPH@	

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for 200 MLD items
			MWC	
<b>b)</b>		<b>Sulphuric Acid Storage and Dosing System</b>		
	i)	Chemical dosage	mg/l	
	ii)	Number of Dosing Tanks	No.	
	iii)	Capacity of dosing tanks	M <sup>3</sup>	
	iv)	Material of Dosing Tank		
	v)	Number of dosing pumps (Working + Standby)	Nos.	
	vi)	Type of Dosing Pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	vii)	Material of dosing pumps		
	viii)	Capacity of dosing pump	LPH@ MWC	
	ix)	Days of Chemical storage ( <i>min 30 days</i> )	days	
	x)	Size of the storage tanks	m <sup>3</sup>	
	xi)	Material of storage tanks		
	xii)	Number of transfer pumps (Working + Standby)	Nos.	
	xiii)	Type of transfer pumps		
	xiv)	Material of transfer pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> </ul>		

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for 200 MLD items
		<ul style="list-style-type: none"> <li>Impeller</li> </ul>		
	xv)	Capacity of transfer pumps	LPH@ MWC	
c)		<b>Ferric Chloride Storage and Dosing System</b>		
	i)	Chemical dosage	mg/l	
	ii)	Number of Dosing Tanks	No.	
	iii)	Capacity of Preparation & Dosing Tanks	m3	
	iv)	Material of Dosing Tanks		
	v)	Internal Coating of Tanks ( <i>Acid resistant tiles required</i> )		
	vi)	No. of Agitators		
	vii)	MOC of Agitators		
	viii)	Number of dosing pumps (Working + Standby)	Nos.	
	ix)	Type of Dosing Pumps		
	x)	Material of dosing pumps <ul style="list-style-type: none"> <li>Casing</li> <li>Shaft</li> <li>Impeller</li> </ul>		
	xi)	Capacity of dosing pump	LPH@ MWC	
	xii)	Days of chemical storage ( <i>min 30 days</i> )	days	
	xiii)	Number of storage tanks ( <i>min 2 required</i> )		
	xiv)	Size of the storage tanks	m3	
	xv)	Material of storage tanks		

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for 200 MLD items
	xvi)	Number of transfer pumps (Working + Standby)	Nos.	
	xvii)	Type of transfer pumps		
	xviii)	Material of transfer pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	xix)	Capacity of transfer pumps	LPH@ MWC	
<b>d)</b>		<b>Poly-electrolyte Storage and Dosing System</b>		
	i)	Chemical dosage	mg/l	
	ii)	Number of Dosing Tanks	No.	
	iii)	Capacity of dosing tanks	m3	
	iv)	Material of Dosing Tank		
	v)	Internal Coating of Tanks		
	vi)	No. of Agitator		
	vii)	MOC of Agitator		
	viii)	Number of dosing pumps (Working + Standby)	Nos.	
	ix)	Type of Dosing Pumps		
	x)	Material of dosing pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	xi)	Capacity of dosing pump	LPH@ MWC	

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for 200 MLD items
	xii)	Days of Chemical storage ( <i>min 30 days</i> )	days	
	xiii)	Storage area for solid chemical bags	m <sup>2</sup>	
<b>e)</b>		<b>Flash Mixer</b>		
	i)	Number of mixing chambers		
	ii)	Volume of each chamber	cu m	
	iii)	SWD of chamber	m	
	iv)	Number of mixers in each chamber		
	v)	Velocity gradient	l/sec	
	vi)	MOC of Mixer <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	vii)	Motor RPM	rpm	
	viii)	Residence Time ( <i>min. 20 seconds</i> )	Sec.	
<b>f)</b>		<b>Flocculation Tanks</b>		
	(i)	MOC of flocculation tanks		
	(ii)	Raw Water Flow	m <sup>3</sup> /day	
	(iii)	Nos. of flocculation tanks	Nos.	
	(iv)	Residence time of Flocculator	min	
	(v)	Type of internal coating		
	(vi)	Number of Flocculators (mixers)		
	(vii)	Velocity gradient of mixer	l/sec	

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for 200 MLD items
	(viii)	MOC of Mixer <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	(ix)	Motor RPM	rpm	
<b>g)</b>		<b>Lamella Settler</b>		
	(i)	MOC of Settler		
	(ii)	Raw Water Flow	m <sup>3</sup> /day	
	(iii)	Nos. of settlers	Nos.	
	(iv)	MOC of tube media		
	(v)	Design Flow Through each settler	m <sup>3</sup> /hr	
	(vi)	Effective surface area per tube media	m <sup>2</sup>	
	(vii)	Size of the module L m x B m x H m	m x m x m	
	(viii)	Thickness of the tube plates		
	(ix)	Degree of inclination of the tube	degree	
	(x)	Settling velocity	m/hr	
	(xi)	Surface loading rate in modules ( $max \leq 1$ )	m <sup>3</sup> /m <sup>2</sup> /hr	
	(xii)	Free board of Tube Settler tank	m	
	(xiii)	Hoppers per tube settler tank	Nos.	
	(xiv)	Straight height of hopper	m	
	(xv)	Hydraulic retention time	Hrs	
	(xvi)	Details of structural member for tube media support		
<b>h)</b>		<b>Dissolved Air Flotation</b>		
	(i)	Raw Water Flow	m <sup>3</sup> /day	



S. No.		Items – for 200 MLD Plant Stream	Unit	Description for 200 MLD items
	(ii)	Ferric chloride dose rate	mg/l	
	(iii)	Max polymer dose rate	mg/l	
	(iv)	Expected TSS removal	%	
	(v)	Expected TOC Removal	%	
	(vi)	No. of static mixer		
	(vii)	MOC of static mixer		
	(viii)	MOC of DAF		
	(ix)	Nos. of DAF units	Nos.	
	(x)	DAF surface loading rate ( $\leq 25$ m/hr)	m/hr	
	(xi)	DAF area per cell	m <sup>2</sup>	
	(xii)	DAF cell dimensions	m	
	(xiii)	DAF Recycle Rate ( <i>within 10–15%</i> )	%	
	(xiv)	No. of Recirculation Pumps (duty + standby)		
	(xv)	Material of pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	(xvi)	Discharge flow rate	m <sup>3</sup> /hr	
	(xvii)	Discharge pressure	m	
	(xviii)	DAF Air Dose Rate	mg/l	
	(xix)	No. of Air Compressor		
	(xx)	Air loading rate	g air /m <sup>3</sup>	
	(xxi)	Delivery pressure	m	
	(xxii)	Air Saturator Efficiency	kPa	

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for 200 MLD items
	(xxiii)	Air Saturator Pressure (Gauge)	m	
	(xxiv)	Float Removal mechanism		
<b>i)</b>		<b>Gravity Dual Media Filters</b>		
	(i)	Total Raw Water Flow to DMF	m <sup>3</sup> /day	
	(ii)	MOC of DMF		
	(iii)	Expected TSS removal (> 98% required)	%	
	(iv)	Expected TOC removal	%	
	(v)	Type of filters (Constant head / flow)		
	(vi)	Nos. of DMF filter units	Nos.	
	(vii)	Design Flow through each unit	m <sup>3</sup> /hr	
	(viii)	Effective surface area per filter unit	m <sup>2</sup>	
	(ix)	Size of each filter L m x B m x H m	m x m x m	
	(x)	Surface loading rate (max <8 m/h @ N-2 filters)	m <sup>3</sup> /m <sup>2</sup> /h	
	(xi)	Type of underdrain system		
	(xii)	Number of valves/gates per filter		
<b>j)</b>		<b>Backwash Pump</b>		
	(i)	Type of Pump		
	(ii)	No. of pumps		
	(iii)	Capacity of each pump with VFD	m <sup>3</sup> /hr	
	(iv)	Discharge head	m	
	(v)	Material of pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for 200 MLD items
	(vi)	Rate of backwash water flow rate ( <i>range 24-40 m/h</i> )	m/h	
	(vii)	Water + air backwash included ( <i>If yes – additional pump with low flow required</i> )	Yes / No	
	(viii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
<b>k)</b>		<b>Backwash Blower</b>		
	(i)	Type of blower		
	(ii)	No. of blowers		
	(iii)	Capacity of each blower	Nm <sup>3</sup> /hr	
	(iv)	Material of blower		
	(v)	Rate of backwash air flow rate	m/h	
	(vi)	Discharge head	m	
	(vii)	Variable speed drive	Yes /No	
	(viii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of blower</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
<b>l)</b>		<b>Filter media</b>		

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for 200 MLD items
	(i)	Bed thickness <ul style="list-style-type: none"> <li>• Anthracite</li> <li>• Sand</li> <li>• Garnet</li> <li>• Gravel</li> </ul>	mm	
	(ii)	Effective size <ul style="list-style-type: none"> <li>• Anthracite</li> <li>• Sand</li> <li>• Garnet</li> <li>• Gravel</li> </ul>	mm	
	(iii)	Uniformity coefficient <ul style="list-style-type: none"> <li>• Anthracite</li> <li>• Sand</li> <li>• Garnet</li> <li>• Gravel</li> </ul>		
	(iv)	Specific gravity <ul style="list-style-type: none"> <li>• Anthracite</li> <li>• Sand</li> <li>• Garnet</li> <li>• Gravel</li> </ul>		
<b>m)</b>		<b>Backwash/ RO Feed Tank - For 200 MLD</b>		
	(i)	MOC of Tank		
	(ii)	Number of Tanks		
	(iii)	Capacity of each Tank		
	(iv)	Partition in Tanks ( <i>two chambers</i> )		
	(v)	Provision of valves/gates for online cleaning of the Backwash tanks included	Yes / NO	

**4. RO Desalination System**

*Any additional information is to be given such as alternate technology. Please create space below the table and insert the information*

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
(a)				
		<b>RO Feed Booster Pump</b>		
	(i)	Type of Pump		
	(ii)	No. of pumps (working + standby)		
	(iii)	Capacity of each pump	m <sup>3</sup> /hr @ mWC	
	(iv)	Discharge head	m	
	(v)	VFD included	(Yes/ No.)	
	(vi)	Material of pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	(vii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
(b)		<b>ERD Feed Booster Pump</b>		
	(i)	Type of Pump		
	(ii)	No. of pumps (working + standby)		
	(iii)	Capacity of each pump	m <sup>3</sup> /hr @ mWC	
	(iv)	Discharge head	m	
	(v)	VFD included	(Yes/ No.)	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	(vi)	Material of pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	(vii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
(c)		<b>Cartridge Filter in high pressure line</b>	<b>For 200 MLD</b>	
	(i)	Total Flowrate	m <sup>3</sup> /hr, /MLD	
	(ii)	Total units of duty Cartridge Filter		
	(iii)	Total units of standby Cartridge Filter		
	(iv)	Number of filter elements in each unit		
	(v)	Design flow rate of each filter unit	m <sup>3</sup> /hr	
	(vi)	Head loss	mwc	
	(vii)	Type of cartridge		
	(viii)	Cartridge filter nominal pore size	micron	
	(ix)	Unit Diameter	mm	
	(x)	Unit Height on Straight	mm	
	(xi)	Filtration rate	m <sup>3</sup> /m <sup>2</sup> /hr	
	(xii)	Material of construction <ul style="list-style-type: none"> <li>• Housing</li> <li>• Internals</li> <li>• Filter elements</li> </ul>		
(d)		<b>High Pressure Pump</b>	<b>For 200 MLD</b>	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	(i)	Type of Pump		
	(ii)	No. of pumps (working + standby)		
	(iii)	Capacity of each pump	m <sup>3</sup> /hr @ mWC	
	(iv)	Discharge head	m	
	(v)	VFD included (Yes/ No.)		
	(vi)	Material of pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	(vii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
(e)		<b>ERD Feed Recirculation Pump</b>	<b>For 200 MLD</b>	
	(i)	Type of Pump		
	(ii)	No. of pumps (working + standby)		
	(iii)	Capacity of each pump	m <sup>3</sup> /hr @ mWC	
	(iv)	Discharge head	m	
	(v)	VFD included (Yes/ No.)		
	(vi)	Material of pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	(vii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
<b>(f)</b>		<b>Energy Recovery Device</b>		
	(i)	Type of Isobaric Energy Recovery System – <i>(ERI preferred)</i>	-	
	(ii)	Number of ERD systems per RO train	Nos.	
	(iii)	Total number of ERD systems in one stream	Nos.	
	(iv)	Efficiency of single ERD	%	
	(v)	Noise Level	dB	
	(vi)	Salinity Increase in Pre-treated water at inlet of RO Membrane	%	
	(vii)	Over-flush of ERD	%	
	(viii)	Lubrication flow	%	
	(ix)	Material of Construction <ul style="list-style-type: none"> <li>• Casing</li> <li>• Rotor</li> <li>• Shaft</li> <li>• Other parts in contact with seawater/concentrate</li> </ul>		
<b>(g)</b>		<b>RO System (for 200 MLD Stream)</b>	<b>For 200 MLD</b>	
	<b>g1</b>	<b>General</b>		
	(i)	Net permeate output <i>(min 402000 m3/day to cover potable water demand in the plant)</i>	m3/day	
	(ii)	Gross permeate output <i>The gross permeate shall have enough</i>	m3/day	



S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
		<i>additional margin of surplus capacity to cover the internal use of service water plus potable water demand of the Perur Desalination plant with all its related systems. The contractor shall confirm internal consumption as per detailed design. Minimum 1.0% additional flow (i.e. 404000 m<sup>3</sup>/day).</i>		
	(iii)	Number of duty RO trains	No.	
	(iv)	Number of standby RO trains	No.	
	(v)	Size of each train (height x width x length)	m*m*m	
	(vi)	Train configuration		
	(vii)	Details of RO membrane pressure vessels		
	(viii)	RO membrane models (HR/LE)		
	(ix)	If mixed membrane – HR:LE ratio		
	(x)	RO Manufacturer- The RO membranes manufacturing company shall be supplying membranes for the last 10 years continuously and have supplied membranes to any desalination plant of at least 10 MLD capacity every year.(Manufacturer Assurance needed for supply of membrane in time)		
	(xi)	Number of pressure vessels per Trains		
	(xii)	Number of RO elements per pressure vessel		
	(xiii)	Design Recovery Rate	%	
	(xiv)	Design average flux rate	l/(m <sup>2</sup> *h)	
	(xv)	Design fouling factor	-	
	(xvi)	Design salt passage increase rate per year	%	
	(xvii)	Design flux decrease rate per year	%/annum	
	<b>g2</b>	<b>Maximum seawater condition</b>		
	(i)	Seawater temperature (max temp – 32°C)	deg C	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	(ii)	Seawater TDS ( <i>max design TDS – 39 g/l; Plant should be able to operate at 41 g/l</i> )	mg/l	
	(iii)	Final production rate	m <sup>3</sup> /d	
	(iv)	Final product water TDS ( <i>must be <math>\leq 450</math> mg/l</i> )	mg/l	
	(v)	Average membrane age ( <i>manufacturer's guarantee needed</i> )	Years	
	(vi)	Membrane replacement rate ( <i>manufacturer's guarantee needed</i> )	%/annum	
	<b>g3</b>	<b>Average Condition</b>		
	(i)	Seawater temperature ( <i>max temp – 28°C</i> )	deg C	
	(ii)	Seawater TDS ( <i>average TDS – 36,000mg/l</i> )	mg/l	
	(iii)	Final product production	m <sup>3</sup> /d	
	(iv)	Final product water TDS( <i>must be <math>\leq 450</math> mg/l</i> )	mg/l	
	(v)	Average membrane age ( <i>manufacturer's guarantee needed</i> )	Years	
	(vii)	Membrane replacement rate ( <i>manufacturer's guarantee needed</i> )	%/annum	
	<b>g4</b>	<b>Antiscalant Storage and Dosing System</b>		
	i)	Chemical dose rate	mg/l	
	ii)	Number of dosing tanks	No.	
	iii)	Capacity of dosing tanks	m <sup>3</sup>	
	iv)	Material of dosing tanks		
	v)	Number of dosing pumps (Working + Standby) ( <i>two dosing points</i> )	Nos.	
	vi)	Type of dosing pumps		
	vii)	Material of dosing pumps		

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	viii)	Capacity of dosing pump	LPH@ MWC	
	ix)	Days of Chemical storage ( <i>min 30 days required</i> )	days	
	<b>g5</b>	<b>Sodium Bisulphite Storage and Dosing System</b>		
	i)	Chemical dose rate	mg/l	
	ii)	Number of dosing tanks	No.	
	iii)	Capacity of dosing tanks	M <sup>3</sup>	
	iv)	Material of dosing tanks		
	v)	Number of dosing pumps (Working + Standby) ( <i>two dosing points</i> )	Nos.	
	vi)	Type of dosing pumps		
	vii)	Material of dosing pumps		
	viii)	Capacity of dosing pump	LPH@ MWC	
	ix)	Days of Chemical storage ( <i>min 30 days required</i> )	days	
	<b>g6</b>	<b>Permeate Storage Tank</b>		
	(i)	Number of permeate tanks	No.	
	(ii)	Net volume of permeate tank ( <i>5 ML required</i> )	m3	
	(iii)	Material of Construction <ul style="list-style-type: none"> <li>• Shell plate</li> <li>• roof plate</li> <li>• bottom/annular plate</li> <li>• girder / rafter</li> <li>• column</li> <li>• Inside Protection</li> </ul>		
	(iv)	Water level in the permeate tank ( <i>w.r.t CD</i> )		
	(v)	Permeate draw-back facilities in case of shut-	Yes/No	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
		down provided		
	<b>g7</b>	<b>Flushing Pump</b>	<b>For 200 MLD</b>	
	(i)	Type of Pump		
	(ii)	No. of pumps (working + standby)		
	(iii)	Capacity of each pump	m <sup>3</sup> /hr @ mWC	
	(iv)	Discharge head	m	
	(v)	VFD included (Yes/ No.)		
	(vi)	Material of pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	(vii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
	<b>g8</b>	<b>RO Clean in Place System</b>		
	(i)	Number of cleaning tanks	Nos.	
	(ii)	Net volume of each cleaning tanks	m <sup>3</sup>	
	(iii)	Max. pressure vessel cleaned at once	Nos.	
	(iv)	MOC of CIP tanks		
	(v)	MOC of agitator	-	
	(vi)	<b>Type of Cleaning Pumps</b>		
	(vii)	No. of pumps (working + standby)		
	(viii)	Capacity of each pump	m <sup>3</sup> /hr @ mWC	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	(ix)	Discharge head	m	
	(x)	VFD included (Yes/ No.)		
	(xi)	Material of pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	(xii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
	(xiii)	<b>Cartridge filter units for CIP</b>	Nos.	
	(xiv)	Nominal pore size of filters	μm	
	(xv)	Material of Construction <ul style="list-style-type: none"> <li>• Housing</li> <li>Internals</li> <li>• Filter elements</li> </ul>		
<b>g9</b>		<b>CIP Citric Acid Storage and Dosing System</b>		
	i)	Chemical dose rate	mg/l	
	ii)	Number of Dosing Tanks	No.	
	iii)	Capacity of dosing tanks	M3	
	iv)	Material of Dosing Tank		
	v)	Number of dosing pumps (Working + Standby)	Nos.	
	vi)	Type of Dosing Pumps		
	vii)	Material of dosing pumps		

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	viii)	Capacity of dosing pump	LPH@ MWC	
	ix)	Days of Chemical storage ( <i>min 30 days required</i> )	days	
	x)	No. of storage tanks ( <i>min two tanks required</i> )	No.	
	xi)	Size of the storage tanks	m <sup>3</sup>	
	xii)	Material of storage tanks		
	xiii)	Number of transfer pumps (Working + Standby)	Nos.	
	xiv)	Type of transfer pumps		
	xv)	Material of transfer pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	xvi)	Capacity of transfer pumps	LPH@ MWC	
	<b>g10</b>	<b>CIP Caustic Storage and Dosing System</b>		
	i)	Chemical dose rate	mg/l	
	ii)	Number of Dosing Tanks	No.	
	iii)	Capacity of dosing tanks	M <sup>3</sup>	
	iv)	Material of Dosing Tank		
	v)	Number of dosing pumps (Working + Standby)	Nos.	
	vi)	Type of Dosing Pumps		
	vii)	Material of dosing pumps		
	viii)	Capacity of dosing pump	LPH@ MWC	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	ix)	Days of Chemical storage ( <i>min 30 days required</i> )	days	
	x)	No. of storage tanks ( <i>min two tanks required</i> )	No.	
	xi)	Size of the storage tanks	m <sup>3</sup>	
	xii)	Material of storage tanks		
	xiii)	Number of transfer pumps (Working + Standby)	Nos.	
	xiv)	Type of transfer pumps		
	xv)	Material of transfer pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	xvi)	Capacity of transfer pumps	LPH@ MWC	
	<b>g11</b>	<b>CIP HCl Storage and Dosing System</b>		
	i)	Chemical dose rate	mg/l	
	ii)	Number of Dosing Tanks	No.	
	iii)	Capacity of dosing tanks	M <sup>3</sup>	
	iv)	Material of Dosing Tank		
	v)	Number of dosing pumps (Working + Standby)	Nos.	
	vi)	Type of Dosing Pumps		
	vii)	Material of dosing pumps		
	viii)	Capacity of dosing pump	LPH@ MWC	
	ix)	Days of Chemical storage ( <i>min 30 days required</i> )	days	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	x)	No. of storage tanks (min two tanks required)	No.	
	xi)	Size of the storage tanks	m <sup>3</sup>	
	xii)	Material of storage tanks		
	xiii)	Number of transfer pumps (Working + Standby)	Nos.	
	xiv)	Type of transfer pumps		
	xv)	Material of transfer pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	xvi)	Capacity of transfer pumps	LPH@ MWC	
		<b>Other related items</b>		
	i)	A membrane test stand in accordance with ASTM D 4194-03 will be provided		
	ii)	Sample collection station from each vessel provided		

## 5. Post Treatment

S. No.	Item for 200 MLD Stream		Unit	Description
(a)		<b>Limestone Filter (LSF)</b>	<b>For 200 MLD</b>	
	(i)	Treated water flow rate <i>The net production shall have enough additional margin of surplus capacity to cover the internal potable water demand of the Perur Desalination plant with all its related systems. The contractor shall confirm internal consumption as per detailed design. Minimum</i>	m <sup>3</sup> /d	



		0.5% additional flow (402000 m <sup>3</sup> /day).		
	(ii)	Limestone building bypass	%	
	(iii)	Material of the Limestone Filter		
	(iv)	No. of filter modules per stream		
	(v)	Net surface area per module	m <sup>2</sup>	
	(vi)	Limestone bed Module length	m	
	(vii)	Limestone bed Module width	m	
	(viii)	Limestone bed thickness	m	
	(ix)	Media Contact time	min	
	(x)	Module surface loading rate	m <sup>3</sup> /m <sup>2</sup> .h	
	(xi)	Module surface loading rate N-1	m <sup>3</sup> /m <sup>2</sup> .h	
	(xii)	CO <sub>2</sub> consumption	g/m <sup>3</sup>	
	(xiii)	CO <sub>2</sub> daily consumption	T/day	
	(xiv)	Total hardness in water after remineralization (80 mg/l as CaCO <sub>3</sub> required)	mg/l CaCO <sub>3</sub>	
	(xv)	Calcium hardness addition in product water	mg/l CaCO <sub>3</sub>	
	(xvi)	Type of CO <sub>2</sub> dosing system		
	(xvii)	MOC of CO <sub>2</sub> pipe, valves, and Static Mixer		
	(xviii)	Capacity of CO <sub>2</sub> – storage tank	days	
	(xix)	MOC of CO <sub>2</sub> tank		
<b>(b)</b>		<b>LSF Backwash Pump</b>		
	(i)	Type of Pump		
	(ii)	No. of pumps		
	(iii)	Capacity of each pump with VFD	m <sup>3</sup> /hr	
	(iv)	Discharge head	m	
	(v)	Material of pumps		

		<ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	(vi)	Rate of backwash water flow rate	m/h	
	(vii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
(c)		<b>LSF Backwash Blower</b>		
	(i)	Type of blower		
	(ii)	No. of blowers		
	(iii)	Capacity of each blower	Nm <sup>3</sup> /hr	
	(iv)	Variable speed drive included	Yes/No	
	(v)	Discharge head	m	
	(vi)	Material of blower		
	(vii)	Rate of backwash air flow rate	m/h	
	(viii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of blower</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
(d)		<b>Hypochlorite Storage and Dosing System</b>		
	i)	Chemical dose rate	mg/l	
	ii)	Number of Dosing Tanks	No.	
	iii)	Capacity of dosing tanks	M <sup>3</sup>	
	iv)	Material of Dosing Tank		

	v)	Number of dosing pumps (Working + Standby)	Nos.	
	vi)	Type of Dosing Pumps		
	vii)	Material of dosing pumps		
	viii)	Capacity of dosing pump	LPH@ MWC	
	xvi)	Days of Chemical storage ( <i>min 30 days</i> )	days	
	xvii)	Size of the storage tanks	m3	
	xviii)	Material of storage tanks		
	xix)	Number of transfer pumps (Working + Standby)	Nos.	
	xx)	Type of transfer pumps		
	xxi)	Material of transfer pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	xxii)	Capacity of transfer pumps	LPH@ MWC	
(e)		<b>pH Adjustment - Caustic Storage and Dosing System</b>		
	i)	Chemical dose rate	mg/l	
	ii)	Number of Dosing Tanks	No.	
	iii)	Capacity of dosing tanks	M3	
	iv)	Material of Dosing Tank		
	v)	Number of dosing pumps (Working + Standby)	Nos.	
	vi)	Type of Dosing Pumps		
	vii)	Material of dosing pumps		

	viii)	Capacity of dosing pump	LPH@ MWC	
	ix)	Days of Chemical storage ( <i>min 30 days</i> )	days	
	x)	Size of the storage tanks	m <sup>3</sup>	
	xi)	Material of storage tanks		
	xii)	Number of transfer pumps (Working + Standby)	Nos.	
	xiii)	Type of transfer pumps		
	xiv)	Material of transfer pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	xv)	Capacity of transfer pumps	LPH@ MWC	

## 6.0 Sludge Treatment

S. No.		Item for 400 MLD Stream	Unit	Description
(a)		<b>Neutralization Sump</b>		
	(i)	No. of Sumps		
	(ii)	Construction Material		
	(iii)	Area (L x B)	m <sup>2</sup>	
	(iv)	Tank volume	m <sup>3</sup>	
	(v)	Water height	m	
	(vi)	Free board	m	
	(vii)	Pumps vault size	m x m x m	
(b)		<b>Neutralization Effluent Pumps</b>		
	(i)	Type of Pump		
	(ii)	No. of pumps		
	(iii)	Capacity of each pump with VFD	m <sup>3</sup> /hr	

	(iv)	Discharge head	m	
	(v)	Material of pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	(vi)	Rate of backwash water flow rate	m/h	
	(vii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
<b>(c)</b>		<b>Waste Sludge Balancing Tank</b>		
	(i)	Tank type		
	(ii)	No. of tanks		
	(iii)	Construction Material		
	(iv)	Tank area	m x m	
	(v)	Tank volume	m <sup>3</sup>	
	(vi)	Water height	m	
<b>(d)</b>		<b>Submersible Mixer</b>		
	(i)	Manufacturer		
	(ii)	Type		
	(iii)	Model		
	(iv)	Quantity		
	(v)	Material of construction:		
	(vi)	Casing		
	(vii)	Impeller		
	(viii)	Shaft		

	(ix)	Mechanical seal		
	(x)	Guide mechanism with winch		
	(xi)	Impeller Diameter	mm	
	(xii)	Rotation speed	Rpm	
	(xiii)	Immersion depth	mm	
	(xiv)	Absorbed power	kW	
	(xv)	Motor rating	kW	
	(xvi)	Maximum Lifting weight	Kgs	
<b>(e)</b>		<b>Thickener Feed Pumps</b>		
	(i)	Type of Pump		
	(ii)	No. of pumps		
	(iii)	Capacity of each pump with VFD	m <sup>3</sup> /hr	
	(iv)	Discharge head	m	
	(v)	Material of pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	(vi)	Rate of backwash water flow rate	m/h	
	(vii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
<b>(f)</b>		<b>Static Mixer after polymer dose</b>		
	(i)	Number of duty units	-	
	(ii)	Number of standby units	-	
	(iii)	Manufacturer	-	

	(iv)	Type	-	
	(v)	Design flow of one unit	m <sup>3</sup> /h	
	(vi)	Pressure loss at design flow	m	
	(vii)	Maximum flow of one unit	m <sup>3</sup> /h	
	(viii)	Pressure loss at maximum flow	m	
	(ix)	Material of housing	-	
	(x)	Materials of internals	-	
(g)		<b>Polyelectrolyte Storage and Dosing System for Thickener and BFP</b>		
	i)	Chemical dose rate	mg/l	
	ii)	Number of Dosing Tanks	No.	
	iii)	Capacity of dosing tanks	m <sup>3</sup>	
	iv)	Material of Dosing Tank		
	v)	Number of dosing pumps (Working + Standby)	Nos.	
	vi)	Type of Dosing Pumps		
	vii)	Material of dosing pumps		
	viii)	Capacity of dosing pump	LPH@ MWC	
	ix)	Days of Chemical storage	days	
		<b>Poly solution Agitator:</b>		
	x)	Manufacturer		
	xi)	Model		
	xii)	Type		
	xiii)	Quantity (Duty + Standby)	Nos	

	xiv)	Motor rating	kW	
	xv)	Motor speed	rpm	
	xvi)	Mixer speed		
	xvii)	Impeller material		
	xviii)	Shaft material		
<b>(h)</b>		<b>Thickener</b>		
	(i)	Manufacturer		
	(ii)	Type		
	(iii)	Quantity	Nos	
	(iv)	Size (Diameter x SWD x FB)	m	
	(v)	Scraper speed	rpm	
	(vi)	<ul style="list-style-type: none"> <li>• Torque rating</li> <li>• Design output torque</li> <li>• Shut-off torque</li> </ul>	N-m	
	(vii)	Feed rate per thickener	m <sup>3</sup> /hr	
	(viii)	Feed well size	mm	
	(ix)	Walkway (width x Height)	mm	
	(x)	Weir plate size(Thick x width)	mm	
		<b>Surface Preparation &amp; Protection:</b>		
	(i)	Wetted parts		
	(ii)	Exposed parts		
		<b>Material of Construction:</b>		
	(i)	Bridge and Superstructure		
	(ii)	Feed well		
	(iii)	Walkway Gratings		



	(iv)	Squeegees		
	(v)	Weir plate		
	(vi)	Clamps & Hardware		
		<b>Automatic lifting Device-provided</b>		
	(i)	Motor rating	KW	
	(ii)	Motor speed	rpm	
	(iii)	Motor Make		
	(iv)	Protection		
<b>(i)</b>		<b>Thickened Sludge Holding Tank</b>		
	(i)	Tank type		
	(ii)	No. of tanks		
	(iii)	Construction Material		
	(iv)	Tank area	mxm	
	(v)	Tank volume	m <sup>3</sup>	
	(vi)	Water height	m	
		<b>Submersible Mixer/Agitator</b>		
	(i)	Manufacturer		
	(ii)	Type		
	(iii)	Model		
	(iv)	Quantity		
	(v)	Material of construction:		
	(vi)	Casing		
	(vii)	Impeller		
	(viii)	Shaft		
	(xi)	Mechanical seal		

	(x)	Guide mechanism with winch		
	(xi)	Impeller Diameter	mm	
	(xii)	Rotation speed	Rpm	
	(xiii)	Immersion depth	mm	
	(xiv)	Absorbed power	kW	
	(xv)	Motor rating	kW	
	(xvi)	Maximum Lifting weight	kgs	
<b>(j)</b>		<b>Thickener Feed Pumps</b>		
	(i)	Type of Pump		
	(ii)	No. of pumps		
	(iii)	Capacity of each pump with VFD	m <sup>3</sup> /hr	
	(iv)	Discharge head	m	
	(v)	Material of pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	(vi)	Rate of backwash water flow rate	m/h	
	(vii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
<b>(k)</b>		<b>BFP</b>		
	(i)	Manufacturer		
	(ii)	Type		
	(iii)	Model		
	(iv)	Number of BFPs		

	(v)	Feed rate per BFP	m <sup>3</sup> /h	
	(vi)	Dewatered sludge cake thickness ( <i>&gt;25% dried solids required</i> )	% dried solids	
	(vii)	Noise level (dBA) at 1 m distance from the machine	dBA	
	(viii)	Pressure roll configuration		
	(ix)	Feed pressure required	Kg/cm <sup>2</sup>	
	(x)	Overall dimension of each BFP (LxB)	mm x mm	
	(xi)	Weight per BFP	Kgs	
	(xii)	Wash water requirement		
	(xiii)	No. of belt wash headers		
	(xiv)	Belt tension device		
		<b>Material of Construction:</b>		
	(i)	Structural Frame		
	(ii)	Dispersion device		
	(iii)	Adjustable Wedge		
	(iv)	Pressure rolls		
	(v)	Filtration belts		
	(vi)	Doctors blade		
	(vii)	Roller bearings		
	(viii)	Drainage pan		
	(ix)	Washing belt		
	(x)	Y strainer		
	(xi)	Washer nozzle		
		<b>Belt Press Drives</b>		
	(i)	Manufacturer		

	(ii)	Motor Make /Model		
	(iii)	Motor rating (Main Drive)	kW	
	(iv)	Motor speed	rpm	
	(v)	Insulation class		
	(vi)	Enclosure		
	(vii)	Voltage & Frequency	V / Hz	
		<b>Conveyor Drive</b>		
	(i)	Motor Make		
	(ii)	Motor rating	kW	
	(iii)	Motor speed	rpm	
	(iv)	Make of Motor		
	(v)	Insulation class		
	(vi)	Enclosure		
	(vii)	Voltage & Frequency	V / Hz	
		<b>Belt Conveyor system</b>		
	(i)	Make		
	(ii)	Model		
	(iii)	Type		
	(iv)	Quantity		
	(v)	Capacity	Kg/hr	
	(vi)	Length of conveyor	m	
	(vii)	Angle of Inclination	Degree	
	(viii)	Belt width	M	
	(ix)	Jointing detail/type		
	(x)	Belt rating		

	(xi)	Belt speed	rpm	
	(xii)	Belt scraper-Type / No.		
<b>(l)</b>		<b>BFP Building</b>		
	(i)	<b>Ground Floor</b>		
	(ii)	Polymer tank and storage area	m x m = m <sup>2</sup>	
	(iii)	Thickened sludge Pump room area	m x m = m <sup>2</sup>	
	(iv)	Truck loading area	m x m = m <sup>2</sup>	
		<b>Ist Floor</b>		
	(i)	BFP machine floor area	m x m = m <sup>2</sup>	
	(ii)	Electrical room area	m x m = m <sup>2</sup>	
	(iii)	Local control room area	m x m = m <sup>2</sup>	
<b>(m)</b>		<b>Crane – BFP Building</b>		
	(i)	Manufacturer		
	(ii)	Type and class		
	(iii)	Safe working Load	tonne	
	(iv)	Hoist speed high/low	m/min	
	(v)	Long Travel speed	m/min	
	(vi)	Cross travel speed	m/min	
	(vii)	Span	metres	
		<b>Hoisting Rope:</b>		
	(i)	- Diameter	mm	
	(ii)	- Construction		
	(iii)	-Quality of steel		
	(iv)	- Minimum Breaking Load	Kgs	
	(v)	- Factor of safety		

		<b>Motors for Hoist/Long travel/cross travel :</b>		
	(i)	Make		
	(ii)	Type		
	(iii)	Rating	kW	
		<b>Details of Brakes for Hoist/cross travel/Long travel:</b>		
	(i)	Make		
	(ii)	Design Holding Torque	N-m	
	(iii)	Net weight	Tons	

## 7.0 Miscellaneous

*The following are the general technical schedules for different types of equipment including valves and actuators. The Contractor shall provide details of all equipment separately in the respective schedules given below for 200 MLD Stream.*

### 7.1 Service Water System

<b>(a)</b>		<b>Service Water Pumps</b>		<b>For 200 MLD</b>
	(i)	Type of Pump		
	(ii)	No. of pumps		
	(iii)	Capacity of each pump	m <sup>3</sup> /hr	
	(iv)	Discharge head	m	
	(v)	Variable Speed Drive included	Yes/No.	
	(vi)	Material of pumps <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>		
	(vii)	Performance Criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> <li>• Noise level</li> <li>• Vibration level</li> </ul>		
<b>(b)</b>		<b>Service Water Tanks</b>		
	(i)	<b>No. of service water tanks</b>		
	(ii)	Capacity of each service water tank	m <sup>3</sup>	
	(iii)	Tank dimensions (LxBxH)	m x m x m	
		Tank location – Roof of <ul style="list-style-type: none"> <li>• Admin building</li> <li>• BFP building</li> <li>• Chemical buildings</li> <li>• </li> </ul>	m x m x m	

**7.2 Valves**

S. No.	Item		Unit	Description
<b>(a)</b>		<b>Valve</b>		
	(i)	Type		
	(ii)	Position of valve (location)		
	(iii)	Manufacturer		
	(iv)	Model		
	(v)	Service		
	(vi)	Quantity		
	(vii)	Size	mm	
	(viii)	Rating	bar	
	(ix)	Test pressure	bar	
	(x)	Body material		
	(xi)	Disc material		
	(xii)	Sealing face material		
	(xiii)	Shaft material		
	(xiv)	Gear Reducers :		
	(xv)	Manufacturer		
	(xvi)	Material		
	(xv)	Flange Drilling standard		



**7.3 Valve Actuators**

S. No.	Item		Unit	Description
(a)		<b>Valve Actuator</b>		
	(i)	Manufacturer		
	(ii)	Type		
	(iii)	Model		
	(iv)	Service		
	(v)	Quantity		
	(vi)	Motor rating	kW	
	(vii)	Design Torque	Kg-m	
	(viii)	Time for full open to full close	min	

**7.4 Non Return Valves**

S. No.	Item		Unit	Description
		<b>Non-return valves</b>		
	(i)	Manufacturer		
	(ii)	Type		
	(iii)	Model		
	(iv)	Service		
	(v)	Quantity	nos.	
	(vi)	Size	mm	
	(vii)	Rating	Bar	
	(viii)	Test Pressure	Bar	
	(ix)	Design standard		

S. No.	Item		Unit	Description
	(x)	Material of construction:		
		• Body		
		• Disc/plates		
		• Spring		
		• Shaft		
	(xi)	Flange drilling standard		

### 7.5 Sluice Valves

S. No.	Item		Unit	Description
(a)		<b>Sluice Valves</b>		
	(i)	Manufacturer		
	(ii)	Type		
	(iii)	Model		
	(iv)	Service		
	(v)	Number		
	(vi)	Size		
	(vii)	Rating		
	(viii)	Test pressure		
	(ix)	Body material		
	(x)	gate material		
	(xi)	Sealing face material		
	(xii)	Shaft material		
	(xiii)	Gear Reducers :		
	(xiv)	Manufacturer		
	(xv)	Material		
	(xvi)	Flange Drilling standard		

**7.6 Sluice Valve Actuators**

S. No.	Item		Unit	Description
(a)	<b>Sluice Valve Actuators</b>			
	(i)	Manufacturer		
	(ii)	Type		
	(iii)	Number		
	(iv)	Motor rating	kW	
	(v)	Design Torque	Kg-m	
	(vi)	Time for full open to full close	Min	
		( # Bidder to provide above details for each size, type of Valve, Actuator and Service)		

**7.7 Sampling Pumps**

S. No.	Item		Unit	Description
(a)		Manufacturer		
	(i)	Type		
	(ii)	Service/Location		
	(iii)	Quantity		
	(iv)	Capacity	m <sup>3</sup> /hr	
	(v)	Head	M	
	(vi)	Efficiency	%	
	(vii)	Power absorbed	kW	
	(viii)	Speed	Rpm	
	(ix)	Motor rating	kW	

**7.8 Air-Conditioning Equipment**

S. No.	Item		Unit	Description
(a)	Air-conditioner			
	(i)	Make		
	(ii)	Model		
	(iii)	Type		
	(iv)	Capacity	TR	
	(v)	Quantity	nos.	
	(vi)	Motor Rating	kW	
(b)	Air-Ducting			
	(i)	Material		
	(ii)	Size		
	(iii)	Quantity		
	(iv)	Whether all the required accessories are provided	Yes/No	

### 7.9 Fire Fighting Pumps

S. No.	Item		Unit	Description
(a)	(i)	Type of pump		
	(ii)	Total Quantity (working + standby)	Nos.	
	(iii)	Capacity of each Pump	m <sup>3</sup> /hr	
	(iv)	Materials of Construction <ul style="list-style-type: none"> <li>• Casing</li> <li>• Shaft</li> <li>• Impeller</li> </ul>	-	
	(v)	Performance criteria <ul style="list-style-type: none"> <li>• Efficiency of Pump</li> <li>• Motor KW &amp; rpm</li> </ul>		

S. No.	Item		Unit	Description
		<ul style="list-style-type: none"> <li>Noise level</li> <li>Vibration level</li> </ul>		

### 7.10 Vehicles

S. No.	Item		Unit	Description
(a)	i)	Type of New Vehicles (SUV –Scorpio or better)		
	ii)	Total Quantity (5 required) – 3 at project start and 2 after 10 years during O&M period	Nos.	

## 8.0 Plant Guarantees

### 8.1 Plant Process Guarantees

S. No.	Item		Unit	Description
(a)	<b>Product Water Quality at all Feed Seawater Conditions</b>			
	(i)	Faecal Coliforms: (Required counts 0 /100 ml)	Counts/ 100 ml	
	(ii)	Total Coliforms: (Required counts 0 /100 ml)	Counts/ 100 ml	
	(iii)	Residual Chlorine (Required >0.5 mg/l)	mg/l	
	(iv)	Trihalomethane (Required ≤ 0.25 mg/l)	mg/l	
	(v)	TDS (Required ≤ 450 mg/l)	mg/l	
	(vi)	Boron (Required < 1 mg/l)	mg/l	
	(vii)	Total Hardness (> 60 mg/l as CaCO <sub>3</sub> )	mg/l as CaCO <sub>3</sub>	
	(viii)	pH	6.5 – 8.0	
	(ix)	LSI	+ve	

<b>(b)</b>	<b>Thickener Sludge/ Supernatant</b>			
	(i)	Thickened Sludge solid concentration (Required within 3 -5%)	%	
	(ii)	Supernatant TSS: (within 200 mg/l)	mg/l	
<b>(c)</b>	<b>BFP Sludge/ Wash water</b>			
	(i)	BFP Sludge solid concentration (Required $\geq 25\%$ )	%	
	(ii)	Rate of wash water flow rate	m <sup>3</sup> /hr	
	(iii)	The solid constituents for landfill must meet the local and national regulatory discharge limit.	Yes/No.	
	(iv)	Wash water flow per ton of solid in feed	m <sup>3</sup> /ton of solid	
<b>(d)</b>	<b>Wastewater discharge to sea – CPCB norms to be followed</b>			
	(i)	Max TSS	mg/l	
	(ii)	Max TDS	mg/l	
	(iii)	Max Iron	mg/l	
	(iv)	Max Arsenic	mg/l	
	(v)	Other metal ions	mg/l	
	(vi)	The wastewater constituents for sea discharge must meet the local and national regulatory discharge limit.	Yes/No.	

## TECHNICAL SCHEDULE-3- INSTRUMENTATION CONTROL & AUTOMATION SYSTEM

(to be completed by the Bidder)

For 400 MLD Seawater Desalination Plant

Item	Unit	Description
<b>General</b>		
List of Collaboration Companies		
List of Long lead items		
Major OEM		
OEM's Origin		
Collaborating Companies scope briefly		
Detail Design Engineering Scope briefly (Collaborating Consultants / Companies)		
<b>Distributed Control System</b>		
Make		
Type / Model		
Origin		
Life Cycle		
Life Cycle expectancy		
Warranty details		
Service Support		
Collaborations (If any)		
Desalination SWRO reference		
DCS Desalination templates compatibility		
Technical Support		
Spares Support		
Software Details (List all software and brief functionality)		
License Details (Period, tags)		
Server Details		
Controller Details		

Item	Unit	Description
IO Details		
High-Level System Architecture		
Engineering Documentation		
Commissioning Collaboration		
<b>Communication System</b>		
Make		
Origin		
Life Cycle		
Life Cycle expectancy		
Communication (All levels), (Specify the type of communication, etc.)		
Communication Redundancy Scheme		
Communication Backbone Drawing		
Hardware Details		
FO Cable Details		
<b>Condition Monitoring System</b>		
Make		
Type / Model		
Origin		
Life Cycle		
Life Cycle expectancy		
Warranty details		
Service Support		
Collaborations (If any)		
Desalination SWRO reference		
Technical Support		
Spare Support		
Monitoring Analysis Software features		
License Details		
Field Sensor		



Item	Unit	Description
Data Interface equipment		
IO Details		
High-Level System Architecture		
Engineering Documentation		
Commissioning Collaboration		
<b>Reporting System</b>		
Make		
Type / Model		
Origin		
Life Cycle		
Life Cycle expectancy		
Warranty details		
Service Support		
Collaborations (If any)		
Desalination SWRO reference		
Technical Support		
<b>CCTV Surveillance System</b>		
Make		
Type / Model		
Origin		
Operations Camera Details		
Security Camera details		
CCTV management System details		
CCTV Client Viewer Details		
Intruder Detection System Details		
Network Storage Manager Details		
Server Details		
Warranty details		
Service Support		

Item	Unit	Description
Collaborations (If any)		
Technical Support		
Spares Support		
Software Details (List all software and brief functionality)		
<b>Access Control &amp; Security System</b>		
Make		
Type / Model		
Origin		
Access Segment Controller Details		
Card Reader Details		
Door Lock details		
Access Control Management System		
Intruder Detection and Alarming System		
Card Issuing Facility		
Warranty details		
Service Support		
Collaborations (If any)		
Technical Support		
Spares Support		
Software Details (List all software and brief functionality)		
<b>Public Addressing System</b>		
Make		
Type / Model		
Origin		
PA System Details		
PA Zoning Details		
PA Power Amplifier Details		
Loud Speaker System and Loop		

Item	Unit	Description
Central Control PA system		
Warranty details		
Service Support		
Collaborations (If any)		
Technical Support		
<b>Plant PABX &amp; LAN Communication System</b>		
Make		
Type / Model		
Origin		
PABX System		
PABX Equipment		
Software Details		
Equipment Rack and Cabinet Details		
System Capabilities		
Office LAN Network Architecture		
Cabling Details		
LAN Switch		
LAN Server		
Warranty details		
Service Support		
Collaborations (If any)		
Technical Support		

For 400 MLD Desalination Plant

*Bidders are required to copy the schedule for different type of meters / analyser / items*

Item	Unit	Description
<b>Level Measuring System</b>		
Make / Origin		
Accuracy		
Origin		

Item	Unit	Description
<b>Ultrasonic Level Transmitter</b> Make / Origin Accuracy Sensor type		
<b>Conductivity type Level Switch</b> Make Origin No. of electrodes Accuracy	Nos.	
<b>Pressure Gauges</b> Make / Origin Accuracy Over range Protection Blow out Protection Fill Fluid Process Connection Type		
<b>Differential Pressure Measuring System</b> Make / Origin Accuracy Manifold Sensor Type		
<b>Open Channel Flow Measuring System</b> Make / Origin Accuracy Sensor Type Sensor Mounting		
<b>Electromagnetic Flowmeter</b> Make / Origin Accuracy Electrode Types Grounding Electrode Type Accuracy for Potable Water Billing Flow meter		
<b>Ultrasonic Flowmeter</b> Make / Origin Accuracy Measurement Technology		
<b>Insertion Type Flowmeter</b> Make / Origin Accuracy Specific Application Area		

Item	Unit	Description
<b>Turbidity Analyser</b> Make / Origin Type Measurement Technology Calibration Methods / Type Calibration Frequency Reagents used if any Accuracy Debubbler Self-Diagnostics Features Light Source Cleaning Features Maintenance Features (Viper / Air) Mode of Sampling		
<b>Ammonia Analyser</b> Make / Origin Type Measurement Technology Calibration Method / Type Calibration Frequency Reagents used if any Mode of Sampling Accuracy		
<b>TOC Analyser</b> Make / Origin Type Measurement Technology Calibration Method / Type Calibration Frequency Reagents used if any Mode of Sampling Response Time Continuous Online Measurement / Semi-Automatic Measurement Accuracy		
<b>Boron Analyser</b> Make / Origin Type Measurement Technology Calibration Method / Type Calibration Frequency Reagents used if any Mode of Sampling Response Time		

Item	Unit	Description
Continuous Online Measurement / Semi-Automatic Measurement Accuracy		
<b>Residual Chlorine Analyser</b> Make / Origin Type Automatic temperature/pH compensation Measurement Technology Calibration Method / Type Calibration Frequency Reagents used if any Mode of Sampling Response Time Continuous Online Measurement / Semi-Automatic Measurement Accuracy		
<b>SDI Measurement</b> Make / Origin Type Measurement Technology Calibration Method / Type Calibration Frequency Reagents used if any Mode of Sampling Response Time Continuous Online Measurement / Semi-Automatic Measurement Automatic temperature/pH compensation Accuracy		
<b>pH Measurement</b> Make / Origin Type Buffer Measurement Technology Calibration Method / Type Calibration Frequency Reagents used if any Mode of Sampling Response Time Continuous Online Measurement / Semi-Automatic Measurement Automatic temperature/pH		

Item	Unit	Description
compensation Accuracy		
<b>Temperature Measurement</b> Make / Origin Sensor Type Accuracy		
<b>Conductivity Measurement</b> Make / Origin Sensor Type Accuracy Response Time		
<b>Alkalinity Analyser</b> Make / Origin Type Measurement Technology Calibration Method / Type Calibration Frequency Reagents used if any Mode of Sampling Response Time Continuous Online Measurement / Semi-Automatic Measurement Accuracy		
<b>ORP Measurement</b> Make / Origin Sensor Type Calibration Method / Frequency Accuracy Response Time		
<b>TSS Measurement</b> Make / Origin Type Automatic temperature/pH compensation Measurement Technology Calibration Method / Type Calibration Frequency Reagents used if any Mode of Sampling Response Time Continuous Online Measurement / Semi-Automatic Measurement		

## Section IV: Bidding Forms



Item	Unit	Description
Model	Nos.	
Quantity approx.. for:	Nos.	
Intake Works	Nos.	
Pretreatment	Nos.	
RO System	Nos.	
Post Treatment	Nos.	
Sludge Treatment	Nos.	
Substation		
Product water and CW Tanks	Nos.	
<b>Communication module</b>		
Model		
Quantity	Nos.	
<b>Remote I / O module</b>		
Model		
Quantity		
<b>Junction Boxes</b>		
Make		
<b>Control and Instrumentation Cables</b>		
<b>GENERAL</b>		
Manufacturer's name		
Manufacturer's collaboration, if any		
Type of cable		

**TECHNICAL SCHEDULE-4-ELECTRICAL WORKS**

For 400 MLD Desalination Plant

*Bidders are required to copy the schedule for different type of meters / analyser / items***110 kV Metal clad Switchgear**

Item	Unit	Description
<b>Switchgear Reference</b> Manufacturer Type reference Applicable standard		
<b>Switchgear Details</b> Rated voltage Rated short-time withstand current (1 second) Impulse withstand voltage Power frequency withstand voltage Busbar current rating Enclosure Protection	kV kA  kV kV A IP	
<b>Operating Mechanism</b> Rated voltage of shunt trip coil Rating of shunt trip coil	V W	

**3.3 KV Metal clad Switchgear**

Item	Unit	Description
<b>Switchgear Reference</b> Manufacturer Type reference Applicable standard		
<b>Switchgear Details</b> Rated voltage Rated short-time withstand current (1 second) Impulse withstand voltage Power frequency withstand voltage Busbar current rating Enclosure Protection	kV kA  kV kV A IP	
<b>Operating Mechanism</b> Rated voltage of shunt trip coil Rating of shunt trip coil	V W	

**Power Transformers**

Item	Unit	Description	
		Main	Auxiliary
<b>Transformer Reference</b>			
Manufacturer			
Applicable standard			
Transformer type designation			
Rated power	kVA		
Voltage ratio	kV		
Phases	No		
Frequency	Hz		
Minimum Impedance Voltage at 75°C	%		
Rated kVA on principal tap	kVA		
No load loss on principal tap	W		
Load loss on principal tap and rated kVA	W		
Dimensions- width	mm		
-height	mm		
- depth	mm		
Weight	kg		
Guaranteed maximum temperature rise over 50°C ambient			
(a) oil by thermometer	degrees C		
(b) winding by resistance	degrees C		

**LV Switchgear and Control gear**

Item	Unit	Description
<b>Main Switchboard Reference</b>		
Manufacturer/assembler		
Applicable standard		
Dimensions-width	mm	
-height	mm	
- depth	mm	

Item	Unit	Description
Enclosure protection rating	IP	for seconds
Busbar current rating	A	
Short-time withstand current for 1 Sec	kA	
Short circuit certifying authority		
<b>Air Circuit Breakers</b>		
Manufacturer		
Applicable standard		
Type designation	V	
Rated voltage	A	
Rated current	kA	for seconds
Short-time current and duration		
<b>Fused Switches</b>		
Manufacturer		
Applicable standard		
Type designation		
<b>Motor Control Equipment</b>		
Direct on line starters		
Manufacturer		
Rated voltage	V	
Type		

Provide details of each Control MCC/control panel proposed for the Works.

#### Filter Console and DAF Control Panels

Item	Unit	Description
<b>Control panels Reference</b>		
Manufacturer/assembler		
Applicable standard		
Dimensions - width	mm	
- height	mm	
- depth	mm	
Enclosure protection rating	IP	for seconds
Busbar current rating	A	

Item	Unit	Description
Short-time withstand current for 1 Sec Short circuit certifying authority	kA	
<b>Fused Switches</b> Manufacturer Applicable standard Type designation		
<b>Motor Control Equipment</b> Direct on line starters Manufacturer Rated voltage Type	V	
<b>PLC</b> Manufacturer Applicable standard Type designation		

Provide details of each Control panel proposed for the Works.

#### Power Capacitors MV

Item	Unit	Description
<b>Power Capacitors Reference</b> Manufacturer Applicable standard Rating Voltage Frequency Connection Discharge resistors provided No of stages	kVAr V Hz Phase yes/no No	

**Power Capacitors LV**

Item	Unit	Description
<b>Power Capacitors Reference</b>		
Manufacturer		
Applicable standard		
Rating	kVAr	
Voltage	V	
Frequency	Hz	
Connection	Phase	
Discharge resistors provided	yes/no	
No of stages	No	

**Power and Control Cables**

Item	Unit	Description
<b>110 kV Power Cables</b>		
Manufacturer		
Applicable standard		
Conductors - cross-sectional area	material mm <sup>2</sup>	
Cable construction		
Armouring		
<b>11 kV Power Cables</b>		
Manufacturer		
Conductors - cross-sectional area	material mm <sup>2</sup>	
Cable construction		
Armouring		
<b>650/1 100 V Power Cables</b>		
Manufacturer		
Type		
Construction		
Standard		

**Control Cables**

Item	Unit	Description
<b>Control Cables</b> Manufacturer Applicable standard Type Construction Standard		

**Cable Ladder and Tray**

Item	Unit	Description
<b>Cable Ladder</b> Manufacturer Applicable standard  Applicable standard Ladder type Duty Rung type Ladder material Ladder finish Ladder widths Ladder supports and fixings <ul style="list-style-type: none"> <li>- type</li> <li>- material</li> <li>- finish</li> </ul>	      mm mm	
<b>Cable Tray</b> Manufacturer Cable tray type Material Finish Tray widths Cable tray supports and fixings	mm	

Item	Unit	Description
- type		
- material		
- finish		

**Uninterruptible Power Supply**

Item	Unit	Description
<b>Ups Details</b>		
Manufacturer		
Type reference		
Rated output of UPS	kVA	
Mains input to static bypass switch (voltage and phases)	V/ phase	
UPS output (voltage and phases)	V/ phase	
<b>Battery Details</b>		
Manufacturer		
Type reference		
Battery type		
Is battery maintenance free	yes/no	
Is battery sealed or vented	yes/no	
Minimum bridging time of system for each provided		

**Battery and Battery Charger**

Item	Unit	Description
<b>Battery Charger Details</b>		
Manufacturer		
Type reference		
Rated output of Battery Charger	kVA	
Mains input to static bypass switch (voltage and phases)	V/ phase	
Battery Charger output (voltage and phases)	V/ phase	
<b>Battery Details</b>		
Manufacturer		



Item	Unit	Description
Type reference		
Battery type		
Is battery maintenance free	yes/no	
Is battery sealed or vented	yes/no	
Minimum bridging time of system for each provided		

**Diesel Generator Supply**

Item	Unit	Description
<b>DG Details</b> (3 DG – one for each stream and one for the buildings and streets lighting)		
Manufacturer		
Type reference	kVA	
Rated output of DG Generator	V/ phase	
Mains input to static bypass switch (voltage and phases)	V/ phase	
Generator output (voltage and phases)		

**415 V Non-Segregated Busducts**

Item	Unit	Description
Manufacturer's name & address		
Applicable Standards		
Type of busduct		
Material and cross section of busbars	mm <sup>2</sup>	
Rated voltage	Volts	
Maximum voltage at which bus duct can operate continuously	Volts	
Continuous current rating of busbars	Amps	
Short circuit current ratings & duration	KA/Sec	
Momentary current rating (peak)	KA	
Temperature rise over the ambient temperature	°C	

Item	Unit	Description
Busbars	°C	
Enclosures		
Material of support insulators		
No. & arrangement of support insulators		
Material of gaskets		
One minute power frequency withstand voltage	KV	
Conductor Clearance		
Phase to phase	mm	
Phase to earth	mm	
Phase to Neutral	mm	
Average weight per meter of bus duct	Kg	
Material & thickness of Busduct	mm	
Shape & size of enclosure	mm	

**LIGHTING**

Item	Unit	Description
Lighting distribution board		
Make		
Applicable standard		
Type of construction		
Degree of protection		
Lighting Panel		
Make		
Applicable standard		
Enclosure		
Degree of protection		
Indoor		
Outdoor		
Miniature Circuit Breakers		
Make		
Type designation		
Applicable standard		
Rated current, voltage		
Breaking capacity of 0.6 pf		
<b>Isolator</b>		
Make		
Type designation		
<b>Fuses</b>		

Item	Unit	Description
Make Type Applicable standard		
<b>Conductor</b> Make Type and duty Applicable standard		
<b>Synchronous timer</b> Make Type Applicable standard		
<b>Lighting fixtures and Accessories</b> Make of lighting fixtures & accessories Catalogue for each type of fixtures attached as Annexure No.		
<b>Switches</b> Make Type Catalogue attached as annexure No.: Applicable standard		
<b>Receptacles/Socket</b> Make Type Applicable standard		
<b>Junction boxes</b> Make Type Material Applicable standard		
<b>Terminal Blocks</b> Make Type Rating		
<b>Rigid steel Conduits/Fittings &amp; accessories</b> Make Material Applicable standard		
<b>Hume Pipes</b> Make Applicable standard		
<b>Flexible Steel standard</b> Make Applicable standard		

Item	Unit	Description
<b>Lighting wires</b> Make Applicable standard		
<b>Lighting Poles</b> Make Applicable standard Type Pole height		
<b>Lighting masts</b> Make Type Overall height Applicable standard Catalogue attached as annexure no.		
Type test report & all items for station lighting enclosed as annexure no.		

**MOTORS**

Item	Unit	Description
Manufacturer & Country of origin		
Equipment Motor type (Sq. Cage/ Slip ring/DC etc.) Type of duty		
Frame size		
Applicable standard to which motor conforms		
Standard confirms rating at 50 deg. C ambient temperature		
Max. power input to the driven equipment at design duty point	KW	
Max. power input to the driven equipment over entire operating range (KW)(For HT motors only) (a)At rated speed (b)At 103 % speed		

Item	Unit	Description
Stator winding insulation (a) Class & type (b) Tropicalized (c) Temperature rise over specified ambient of 50 deg		
Direction of rotation as viewed from non driving end		
Full load current at rated voltage & frequency		
Power Factor at rated load		
Starting current at 100 % voltage 85 % voltage		
Torques (kg-meter) at Starting Pull-up Pull-out		
Type of Construction of rotor		
Rotor insulation		
Type of enclosure and method of cooling		
Degree of protection		
Rated voltage and frequency		
Efficiency at design duty point (with out -ve tolerance) Efficiency at 100 % full load		
Power factor at design duty point		
Type of mounting		
Type of terminal box for stator leads		
Bearing type DE NDE		
Type test certificates enclosed as Annexure No.:		

**Please add an additional item as per contract.**

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## TECHNICAL SCHEDULE-5-DESALINATION PLANT OPERATING DETAILS

(to be completed by the Bidder)

Item	Unit	Description
<b>Maximum Feed Seawater Flow Rate</b>	MLD	
<b>Minimum Feed Seawater Flow Rate</b>	MLD	
<b>Gross Product Flow Rate</b>	MLD	
<b>Net Product Flow Rate</b>	MLD	
<b>Electrical loads</b>	kVA	
(1) Total connected load <i>(Please provide details of the loads in excel sheet)</i>	kVA	
(2) Maximum running load	kVA	
(3) Average running load	kW	
(4) Expected maximum demand for 20 minute period when the work is operating at full capacity	--	
(5) Average power factor		
<b>Chemical usage</b>		
(1) Hypochlorite for Shock Chlorination	Tonnes/year	
(2) Hypochlorite for Pre Chlorination	Tonnes/year	
(3) FeCl <sub>3</sub> solution dosing (40%)	Tonnes/year	

Item	Unit	Description
(4) Anionic Polymer dosing (Food grade)	Tonnes/year	
(5) Cationic Polymer for Thickener (Non Food grade)	Tonnes/year	
(6) Cationic Polymer for BFP (Non Food grade)	Tonnes/year	
(7) Antiscalant	Tonnes/year	
(8) Sodium Bisulphite	Tonnes/year	
(9) Any other chemical for biofouling control	Tonnes/year	
(10) CO <sub>2</sub> for remineralization	Tonnes/year	
(11) CaCO <sub>3</sub> for remineralization	Tonnes/year	
(12) Hypochlorite for Post Chlorination	Tonnes/year	
(13) NaOH for pH adjustment pre/post RO system	Tonnes/year	
(14) Acetic Acid for CIP	Tonnes/year	
(15) HCL for CIP	Tonnes/year	
(16) NaOH for CIP	Tonnes/year	
(17) HCL for Neutralization after CIP	Tonnes/year	
(18) NaOH for Neutralization after CIP	Tonnes/year	
(19) Any other chemical	Tonnes/year	
<b>Maximum Spares required per annum</b> (Contractor to furnish the details)		
(1) Mechanical (percent of total mechanical items values)	%/year	
(2) Electrical (percent of total electrical items values)	%/year	
(3) Instrumentation (percent of total Instrumentation Items values)	%/year	
(4) Laboratory (percent of total laboratory items values)	%/year	



## **TECHNICAL SCHEDULE-6 - QUALITY ASSURANCE & QUALITY CONTROL PLAN**

The Bidder shall provide copies of the company's standard rules and regulations regarding quality assurance and quality control procedures for works in general and works of a similar nature.

The Bidder shall provide its proposed Quality Assurance and Quality Control Plan in detail so as to demonstrate the procedures and tests that will be used to ensure that the quality concerns and requirements as set forth in Clause 3.8, Quality Assurance as given in Part 2, Particular Process Requirements are satisfactorily met.

The proposed plan will describe but not limited to:

- the type, frequency and procedure of tests to be done on sites
- type, frequency and procedure of tests to be done in pipe manufacturing units at site, if applicable
- type, frequency and procedure of tests to be done at manufacturers' locations outside the sites
- all parameters to be measured in these tests; permissible limits of such parameters; details of laboratories to be established at sites; details of testing equipment & machines and their calibration schedules
- details of the Bidder's internal systems for assuring quality control at the manufacturers' works outside the sites
- details of qualifications and experience of the Quality Control professionals to be deployed for the entire project
- the systems of Quality Audit to be instituted for systematic and professional management as well as adherence with the highest standards of quality of all construction works

All the tests of samples taken from the site are proposed to be done through recognized test houses of international standards and number of samples and frequency of sampling of materials brought to the site and the products manufactured at site shall be as per Specifications. All such samples shall be taken in the presence of Employer's authorized representatives or the Engineer.

The Bidder shall provide separate descriptions of its proposed QA/QC plan during the construction phase, and the subsequent operations and maintenance phase. This will be an initial QA/QC plan which will address to basic requirements of Quality control and Quality assurance of the works.

## **TECHNICAL SCHEDULE-7-ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

The Bidder shall provide his Environmental and Social Management Plan (ESMP) in detail so as to demonstrate the procedures that will be used to ensure that the environmental and social concerns and requirements.

After award of contract and before start of work, Contractor shall review the available Environmental and Social Management Plan (ESMP) for the project available below with CMWSSB. The contractor shall duly update the ESMP to ensure compliance with all applicable legislation and regulations of State/ Central Government and also with JICA Environmental and Social guidelines. The ESMP shall incorporate the requirements stipulated in the Project's EIA Report and conditions of approval from State/ Centre Regulatory agencies. The ESMP shall also clearly define roles, responsibilities, reporting requirement and budgetary allocations for implementation of mitigation measures. The revised ESMP shall be submitted by the Contractor to CMWSSB for necessary approval before initiating any ground work.

The ESMP shall identify the potential environmental and social impacts from the various construction and operations and maintenance activities to be undertaken in the Contract and set out in detail the approach he will adopt in mitigating these impacts to ensure that the residual impacts are minor and confined to a short period.

While preparing the proposed ESMP the Bidder shall consider but not be limited to the following:

- The Bidder shall pay attention to the methods of materials delivery, storage, usage and disposal; equipment usage; and site activities to ensure they have minimal impact on the environment, workforce and community,
  - The Bidder shall propose only environmentally safe products and practices in performing his works, and
- The Bidder shall comply with all the statutes regarding environmental and social impacts.

The Bidder shall provide separate descriptions of its proposals for minimizing any adverse environmental and social impacts/ effects during the construction phase and the subsequent operations and maintenance phase.

## **TECHNICAL SCHEDULE-8-SAFETY PLAN**

The Bidder shall provide his proposed Safety Plan in detail so as to demonstrate compliance with the requirements set forth in Clause 3.9, Part 2, Particular Process Requirements.

The Safety Plan shall include a policy statement signed by the CEO or equivalent authority of the Organization declaring that Safety and loss prevention shall be given the highest practicable priority in all aspects of the Contract.

The Bidder shall describe his proposed Safety Plan which shall be developed to ensure zero fatal accidents and zero hazardous incidents/occurrences in all construction works, including descriptions of the company's standard policies and procedures regarding its site organization and procedures, methods and frequency of conducting safety audits at the Site(s), record keeping and reporting, providing safety training for its personnel, issue and mandatory use of safety equipment, and details of the qualifications and experience of the Bidder's proposed safety officers to be deployed at the Site(s).

The Bidder shall provide separate descriptions of its proposed Safety Plan during the construction phase, and the subsequent operations and maintenance phase.

This will be an initial Safety Plan which will address to the safety of all persons entitled to be at site including the Employer's personnel.

## TECHNICAL SCHEDULE-9 -FUNCTIONAL GUARANTEES OF THE PLANT AND EQUIPMENT

### 1. GENERAL

This document sets out the functional guarantees required to be provided by the Bidder for assessing the performance of the 400 MLD seawater desalination plant and facilities, and which shall be used by the Employer to evaluate its satisfactory performance during the Process Proving Test and during the O&M period.

The Bidder shall complete the following sections and provide values for the product water output, pre-treated seawater at every treatment units and at RO feed, electrical energy usage, and chemical usage for the quantities of water produced on a daily basis, based on the performance criteria set out in the Particular Specifications, and **the raw water quality parameters provided in Part 2 Chapter-1 Project Requirements.**

Notes:

- 1) The values provided in this Schedule will also be used to assist the Employer in determining the typical annual running costs for operation and maintenance of the Works; the estimated costs derived from this information will be used to assist in evaluating the Bids.
- 2) If, during operation and maintenance of the seawater desalination plant and facilities, the raw water quality parameters exceed those listed in the Part 2 Chapter-1 Employer's Requirement, the Employer shall not reimburse to the Contractor the additional treatment costs incurred, if any, to produce the product water of the required quality and quantity, subject to clause 21.8 of Part-III (Specific Provisions). The Bidder should evaluate the historical seawater quality at the Perur site at his own resources before bidding for the project.

### 2. FUNCTIONAL GUARANTEES

#### 2.1 Overall Performance of the Plant

The maximum continuous output which will be achieved during the Process Proving Tests after plant commissioning and during O&M of the plant is Guaranteed to meet the following performance standards:

The continuous net output of product water at the seawater desalination plant shall be not less than:

\_\_\_\_\_ MLD, and based on a raw water input of \_\_\_\_\_ MLD (seawater) and \_\_\_\_\_% plant availability (*minimum 97% of monthly average*)

The maximum energy required for operating and maintaining the constructed SWRO desalination plant and facilities at the required quality and capacity during the Tests and O&M period is guaranteed to be as:	Not more than _____ kWh per cubic meter (m <sup>3</sup> ) of product output water under the range of the specified seawater conditions.
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**2.2 The guaranteed average Energy consumption per m<sup>3</sup> every year during O&M period shall not be more than as follows:**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avg. Specific Energy Consumption, kWh/m <sup>3</sup> of Product water										
	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Avg. Specific Energy Consumption, kWh/m <sup>3</sup> of Product water										

Bidder shall be required to demonstrate the example of the power consumption at their plants constructed elsewhere with the similar processes. The specific energy consumption quoted in the Year 1 should be met during the Process Proving Test.

**2.3 Performance of Pretreatment Units**

Lamella Filter	(i) Reduction of TSS: _____%
	(ii) Reduction of TOC: _____%
DAF	(iii) Reduction of TSS: _____%
	(iv) Reduction of TOC: _____%
Dual Media Filter	(v) Reduction of TSS: _____%
	(vi) Reduction of TOC: _____%

**The silt density index (SDI) of the Pre-treated or RO feed seawater quality before Cartridge Filter must be < 3.0 @ 95%ile and < 4.0 @ 100%ile all the time.**

**2.4 RO Permeate**

S. No.	Items	Conditions	Values
(i)	Total Dissolved Solids	Not more than	mg/l
(ii)	Boron	Not more than	mg/l
(iii)	pH	Not more than	

**2.5 Product Water Quality**

Product water quality after remineralization, disinfection and pH correction shall comply with IS 10500 / 2012 and shall be with the following requirements:

Main potable water requirement:

Parameter	Unit	Value
True color	Hazen	<5.0
pH	-	6.5-8.5
Turbidity	NTU	< 1.0
TDS	mg/l	< 450
Chloride	mg/l	< 250
Free Chlorine	mg/l	> 0.5
Boron	mg/l	<1.0
Total Hardness	mg/l as CaCO <sub>3</sub>	>60
LSI		Positive

**2.6 Wastewater Discharge to Sea – as per the CPCB norms**

Total Dissolved Solids (TDS) <i>Should correlate with EIA dispersion guidelines</i>	Not more than _____ mg/l
Total Suspended Solids (TSS) <i>Should correlate with EIA dispersion guidelines</i>	Not more than _____ mg/l
Individual Metal Concentration All metal concentrations should correlate EIA dispersion guidelines	Fe: not more than _____ mg/l As: not more than _____ mg/l Hg: not more than _____ mg/l etc.

## 2.7 Chemical Consumption

The consumption rates of Chemicals required for Operation and Maintenance of the constructed 400 MLD seawater desalination plant and facilities during the Process Proving Tests after plant commissioning and then after O&M period are guaranteed to be less than as follows, based on the minimum and maximum range of raw water qualities as per the data furnished in the Project Requirements and Particular Specifications, Part-2.

S. No.	Chemicals	Maximum Rate of Consumption
(i)	Hypochlorite for Shock Chlorination	_____ Kg /ML product water
(ii)	Hypochlorite for Pre Chlorination	_____ Kg /ML product water
(iii)	FeCl <sub>3</sub> solution dosing (40%)	_____ Kg /ML product water
(iv)	Anionic Polymer dosing for flocculation (Food grade)	_____ Kg /ML product water
(v)	Cationic Polymer for Thickener (Non Food grade)	_____ Kg /ML product water
(vi)	Cationic Polymer for BFP (Non Food grade)	_____ Kg /ML product water
(vii)	Antiscalant	_____ Kg /ML product water
(viii)	Sodium Bisulphite	_____ Kg /ML product water
(ix)	CO <sub>2</sub> for remineralization	_____ Kg /ML product water
(x)	CaCO <sub>3</sub> for remineralization	_____ Kg /ML product water
(xi)	Hypochlorite for Post Chlorination	_____ Kg /ML product water
(xii)	NaOH for pH adjustment pre/post RO system	_____ Kg /ML product water
(xiii)	Acetic Acid for CIP	_____ Kg /ML product water
(xiv)	HCL for CIP and Neutralization	_____ Kg /ML product water
(xv)	NaOH for CIP and Neutralization	_____ Kg /ML product water
(xvi)	Any other chemical	_____ Kg /ML product water

**2.8 The guaranteed maximum Chemical consumption every year during O&M period producing the net 400 MLD product water shall not be more than as follows:**

S. No.	Chemicals	Units	Maximum Consumption as supplied per year
(i)	Hypochlorite for Shock Chlorination (10.3%)	m3	
(ii)	Hypochlorite for Pre Chlorination (10.3%)	m3	
(iii)	FeCl3 solution dosing (40%)	m3	
(iv)	Anionic Polymer dosing for flocculation (Food grade) (100%)	tonnes	
(v)	Cationic Polymer for Thickener (Non Food grade) (100%)	tonnes	
(vi)	Cationic Polymer for BFP (Non Food grade) (100%)	tonnes	
(vii)	Antiscalant (100%)	m3	
(viii)	Sodium Bisulphite (35%)	m3	
(ix)	CO2 for remineralization (100%)	tonnes	
(x)	CaCO3 for remineralization (100%)	tonnes	
(xi)	Hypochlorite for Post Chlorination	m3	
(xii)	NaOH for pH adjustment pre/post RO system (50%)	m3	
(xiii)	Citric Acid for CIP (100%)	tonnes	
(xiv)	HCL for CIP and Neutralization (33%)	m3	
(xv)	(xvi)NaOH for CIP and Neutralization (50%)	m3	
(xvii)	Any other chemical		



## TECHNICAL SCHEDULE-10 STATEMENT OF DEVIATIONS FROM THE TECHNICAL SPECIFICATIONS

The Bidder shall describe all proposed deviations from the specifications and Drawings set out under Part 2 Technical Specifications, clause by clause, in this Schedule.

The Bidder should note that the specifications given in the Bid Document are the minimum acceptable, and that only standard that is better / higher than the ones referred to in the Bid Document will be acceptable. Acceptance of the Bid shall not be construed as approval by the Employer of any deviations from the Technical Specifications. All details will be subject to the approval of the Engineer during execution of the Contract

<b>Sub Section Number</b>	<b>Title of Subsection</b>	<b>Clause No.</b>	<b>Specification as per Bid Document</b>	<b>Deviation &amp; Specifications Proposed with standard code reference</b>	<b>Reasons for Deviation</b>

The Bidder hereby certifies that the above-mentioned deviations are the only deviations from the technical specifications set forth under Part-2: Technical Specifications, and that he accepts all the remaining technical requirements of the Bid Document.

### TECHNICAL SCHEDULE-11 -STATEMENT OF COMPLIANCE WITH THE BIDDING DOCUMENTS

The Bidder shall describe all proposed deviations from the Statements and the Conditions of Contract set out under Part 3 documents giving references to the Clause, paragraph and page number, along with a description of the proposed deviation and the reason for proposing such deviation. Acceptance of any deviation is solely on the discretion of the Employer.

Title of Subsection	Clause Number	As mentioned in Bid Document	As offered in Bid Document	Reasons for Deviation

The Bidder hereby certifies that the above mentioned deviations are the only deviations from the Contractual Requirements set forth under Part 1 and Part 3: General Requirement, and that he accepts all the remaining general requirements of the Bid Document. **In case there is no deviation, the same needs to be mentioned clearly and signed below.**

## **METHOD STATEMENT**

(Insert Technical Proposal for Method Statement)

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## **SITE ORGANIZATION**

The Bidder shall submit the following details:

- Organization Chart during Design Build Period
- Organization Chart during Operation Service Period
- CV's of the personnel for the key positions as described in Section III Evaluation and Qualification Criteria (Clause 1.1.1)

Site Organization will be evaluated based upon the completeness & organization charts to provide the required positions and experience to execute the works and of Key Positions in compliance with Evaluation Criteria in Section III (Clause 1.1.1)

## **OPERATION AND MAINTENANCE (O&M) PLAN**

The Bidder shall submit an Operations and Maintenance Plan (O&M Plan) for the 400 MLD Desalination Plant. The O&M plan shall meet the requirements of Volume II, Part-2, A-13 Operation and Maintenance and shall include the following components.

- A. Staffing Plan and Staffing Skills
  - 1. Complete Staffing Plan.
  - 2. Comprehensive Training Programme for O&M and in assessing deterioration in plant facilities and equipment.
  - 3. Programme for maintaining staff health and personal hygiene.
  - 4. Continuous security employing Guard staff.
  - 5. Provide staff with adequate Personal Protective Equipment.
- B. Identification of planned Annual Maintenance Contracts (AMC) for contracted maintenance services on specialty equipment including AMC Contracts with the PLC and SCADA system suppliers for the duration of the O&M Period.
- C. Identify insurance policies to be taken that shall be in the joint names of the Contractor and the Employer.
- D. Programme for Maintenance of Storage of materials, consumables, special tools and spare parts.
- E. Description of the Bidder's proposed Operations & Maintenance Manual, that shall include the following:
  - 1. Operations
    - a. Equipment Operations including Normal Startup/Shut down and routine operation as well as emergency operation
    - b. Chemical Feed Systems including maintaining sufficient chemical inventory and chemical dose control
    - c. Water Quality Monitoring and compliance with treatment requirements
    - d. Regular Documentation of Operation
  - 2. Maintenance
    - a. Preventive or routine maintenance
    - b. Corrective or Remedial maintenance
    - c. Concurrent Maintenance on standby or idle units allowing full plant operations during the maintenance activity.
    - d. Manufacturer's Operations and Maintenance Instructions
  - 3. Update O&M Manual as required to reflect changes in plant or facility operations or maintenance.
- F. Maintenance responsibilities shall include the following:

1. Maintain facility in clear and safe working order including adequate ventilation and lighting.
2. Maintain yard gardens landscaping, road, exterior lighting, earthen shoulders and drains
3. Maintain equipment servicing and lubrication schedule including acceptable lubricants
4. Maintain recommended cleaning, care and maintenance of materials and finishes and make timely repairs of internal and external finishes.
5. Maintain adequate sampling and testing of water quality parameters

G. Maintenance Management System incorporating:

1. Preparation of Work Orders and documentation of completion.
2. Repair history of all mechanical, electrical, instrumentation control equipment and communication instruments.
3. Daily log of operations
4. Hourly readings of key operational parameters that provide timely confirmation of successful treatment.
5. Sea-water and clear water quality test results on turbidity, residual chlorine levels, etc. (every 6 hours)
6. Daily list of alarms with time tag;

H. Reporting

1. Monthly Reports concisely summarizing key operational condition and key maintenance performed as well as identification of O&M issues that may require CMWSSB action.
2. Monthly Report shall be in a format acceptable to CMWSSB.
3. Annual Report shall be in a format acceptable to CMWSSB.

I. Documents

1. Maintain key and relevant documents on-site;
  - a. Name plate data of installed equipment
  - b. Copy of all Warrantees, Bonds and AMC Service Contract
  - c. Copy of Approved GA Drawings Drawing/Shop Drawings (Good for Construction Drawings)
  - d. Complete set of electrical schematics and wiring diagrams
  - e. Name and Contact information of authorized service and maintenance firms
  - f. Copies of all Pre-Commissioning, Commissioning, Trial Operation Tests and Test after Completion

Evaluation of the Bidder's proposed O&M Plan will be based upon the thoroughness of the Plan, compliance with requirements included in Part 2 -Employer's Requirements and the

extent to which the Bidder's Plan indicates management of plant operations to optimize power consumption and chemical usage and ensure satisfactory operation and maintenance of the whole works at all times. Non submission of the O&M Plan will be construed as the bidders bid is non-responsive and will be rejected during technical evaluation.

**FORM PER -1: PROPOSED PERSONNEL**

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

Joint Venture Party Legal Name: [insert full name]

IFB No.: [insert number]

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

[The Bidder shall provide the names of suitably qualified personnel to meet the specified requirements stated in Section III, Evaluation and Qualification Criteria, Clause 1.1.1 for Single-Stage Bidding or Clause 1.1 for Two-Stage Bidding.]

<b>1.</b>	<b>Title of position*</b>
	<b>Name</b>
<b>2.</b>	<b>Title of position*</b>
	<b>Name</b>
<b>3.</b>	<b>Title of position*</b>
	<b>Name</b>
<b>4.</b>	<b>Title of position*</b>
	<b>Name</b>

\*As listed in Section III.



**FORM PER -2: RESUME OF PROPOSED PERSONNEL**Date: *[insert day, month, year]*Bidder's Legal Name: *[insert full name]*Joint Venture Party Legal Name: *[insert full name]*IFB No.: *[insert number]*Page *[insert page number]* of *[insert total number]* pages

*[The Bidder shall provide the data on the experience of the personnel indicated in Form PER-1, in the form below.]*

<b>Name of Bidder</b>		
<b>Position</b>		
<b>Personnel information</b>	<b>Name</b>	<b>Date of birth</b>
	<b>Professional qualifications</b>	
<b>Present employment</b>	<b>Name of employer</b>	
	<b>Address of employer</b>	
	<b>Telephone</b>	<b>Contact (manager / personnel officer)</b>
	<b>Fax</b>	<b>E-mail</b>
	<b>Job title</b>	<b>Years with present employer</b>

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

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

**FORM EQU: EQUIPMENT**

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

Joint Venture Party Legal Name: [insert full name]

IFB No.: [insert number]

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

[The Bidders shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Section III, Evaluation and Qualification Criteria, Clause 1.1.2 for Single-Stage Bidding or Clause 1.2 for Two-Stage Bidding. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder.]

<b>Item of equipment</b>		
<b>Equipment information</b>	<b>Name of manufacturer</b>	<b>Model and power rating</b>
	<b>Capacity</b>	<b>Year of manufacture</b>
<b>Current status</b>	<b>Current location</b>	
	<b>Details of current commitments</b>	
<b>Source</b>	<b>Indicate source of the equipment</b>	
	<input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

Omit the following information for equipment owned by the Bidder.

<b>Owner</b>	<b>Name of owner</b>	
	<b>Address of owner</b>	
	<b>Telephone</b>	<b>Contact name and title</b>
	<b>Fax</b>	<b>Telex</b>
<b>Agreements</b>	<b>Details of rental / lease / manufacture agreements specific to the project</b>	

**FORM SUB: PROPOSED SUBCONTRACTORS FOR MAJOR ITEMS  
OF PLANT AND INSTALLATION SERVICES**

A list of major items of Plant and Installation Services is provided below.

The following Subcontractors and/or manufacturers are proposed for carrying out the item of the facilities indicated. Bidders are free to propose more than one for each item.

Major Items of Plant and Installation Services	Proposed Subcontractors/Manufacturers	Nationality
NOT APPLICABLE		

However, the Employer will allow the engagement of subcontractor during execution subject to the approval from the Employer's Representative.

## FORM MAN: MANUFACTURER'S AUTHORIZATION

*[The Bidder shall require the Manufacturer to fill in this Form in accordance with the instructions indicated. This letter of authorization should be signed by a person with the proper authority to sign documents that are binding on the Manufacturer.]*

Date: *[insert date (as day, month and year) of Bid Submission]*

IFB No.: *[insert number of bidding process]*

To: *[insert complete name of Purchaser]*

### WHEREAS

We *[insert complete name of Manufacturer or Manufacturer's authorized agent]*, who are official manufacturers of *[insert type of goods manufactured]*, having factories at *[insert full address of Manufacturer's factories]*, do hereby authorize *[insert complete name of Bidder]* to submit a Bid the purpose of which is to provide the following goods, manufactured by us *[insert name and/or brief description of the goods]*, and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 11, Defect Liability, of the General Conditions of Contract, with respect to the goods offered by the above firm.

Name: *[insert complete name of person signing the Bid]*

In the capacity of *[insert legal capacity of person signing the bid]*

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

Duly authorized to sign the bid for and on behalf of:

*[insert complete name of Bidder]*

Dated on \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ *[insert date of*

*signing]*

**FORM SPA: SPARE PARTS**

<b>Sl. No.</b>	<b>Proposed items of Spare Parts</b>

## **BIDDER'S QUALIFICATION FORMS**

### **Bidder's Qualification following Prequalification**

To establish its qualification to perform the Contract in accordance with Section III, Evaluation and Qualification Criteria, the Bidder shall update the information requested in the corresponding Information Sheets included hereunder:

#### **1. Update of Information**

In accordance with Section III, Evaluation and Qualification Criteria, Clause 2.1, the Bidder shall update the information given during the corresponding prequalification exercise to demonstrate that he continues to meet the criteria used at the time of prequalification using the following forms included hereunder:

##### **(a) Eligibility**

Form ELI - 1: Bidder Information Form  
Form ELI - 2: JV Member Information Form  
Form ELI - 3: Subcontractor Information Form

##### **(b) Historical Contract Non-Performance**

Form CON: Historical Contract Non-Performance & Litigation

##### **(c) Financial Situation**

Form FIN - 1: Financial Situation  
Form FIN - 2: Average Annual Turnover

#### **2. Financial Resources**

Bidders shall also provide information on their financial resources, to meet the requirement in Section III, Evaluation and Qualification Criteria, Clause 2.2, using the following forms:

Form FIN - 3: Financial Resources  
Form FIN - 4: Current Contract Commitments  
Form FIN - 5: Financial Performance

**FORM ELI - 1: BIDDER INFORMATION**Date: *[insert day, month, year]*IFB No.: *[insert number]*Page *[insert page number]* of *[insert total number]* pages*[The Bidder shall provide the following information.]*

1. Bidder's legal name: <i>[insert full name]</i>
2. In case of JV, legal name of the representative member and of each member: <i>[insert full name of each member in the JV and specify the representative member]</i>
3. Bidder's actual or intended country of registration: <i>[insert country of registration]</i>
4. Bidder's actual or intended year of incorporation: <i>[insert year of incorporation]</i>
5. Bidder's legal address in country of registration: <i>[insert street/number/town or city/country]</i>
6. Bidder's authorized representative information Name: <i>[insert full name]</i> Address: <i>[insert street/number/town or city/country]</i> Telephone/Fax numbers: <i>[insert telephone/fax numbers, including country and city codes]</i> Email Address: <i>[insert E-mail address]</i>
7. Attached are copies of original documents of: <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of legal entity named above, in accordance with ITB4.3. <input type="checkbox"/> In case of JV, letter of intent to form JV or JV agreement, in accordance with ITB4.1.
8. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

**FORM ELI - 2: BIDDER'S PARTY INFORMATION**Date: *[insert day, month, year]*IFB No.: *[insert number]*Page *[insert page number]* of *[insert total number]* pages

*[The following form is additional to Form ELI-1, and shall be completed to provide information relating to each JV member (in case the Bidder is a JV) as well as any specialist Subcontractor proposed to be used by the Bidder for any part of the Contract resulting from this process.]*

1. Bidder's legal name: <i>[insert full name]</i>
2. Bidder's Party legal name: <i>[insert full name of Bidder's Party]</i>
3. Bidder's Party country of registration: <i>[insert country of registration]</i>
4. Bidder's Party year of incorporation: <i>[insert year of incorporation]</i>
5. Bidder's Party legal address in country of registration: <i>[insert street/number/town or city/country]</i>
6. Bidder's Party authorized representative information Name: <i>[insert full name]</i> Address: <i>[insert street/number/town or city/country]</i> Telephone/Fax numbers: <i>[insert telephone/fax numbers, including country and city codes]</i> E-mail address: <i>[insert E-mail address]</i>
7. Attached are copies of original documents of <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above, in accordance with ITB 4.3. 8. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.



**FORM CON: HISTORICAL CONTRACT NON-PERFORMANCE**

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

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

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

Joint Venture Party Legal Name: *[insert full name]*

IFB No.: *[insert number]*

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

**1. History of Non-Performing Contracts**

<b>Non-Performing Contracts</b>			
<input type="checkbox"/> Contract non-performance did not occur since 1 <sup>st</sup> January <i>[insert year]</i> , in accordance with the Prequalification criteria, or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.1, as appropriate.			
<input type="checkbox"/> Contract(s) not performed since 1 <sup>st</sup> January <i>[insert year]</i> , in accordance with the Prequalification criteria, or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.1, as appropriate, is (are) indicated below:			
<b>Year</b>	<b>Non- performed portion of Contract</b>	<b>Contract Identification</b>	<b>Total Contract Amount (current value, currency, exchange rate and USD equivalent)</b>
<i>[insert year]</i>	<i>[insert amount and percentage]</i>	<ul style="list-style-type: none"> <li>Contract Identification: <i>[indicate complete Contract name, number, and any other identification]</i></li> <li>Name of Employer: <i>[insert full name]</i></li> <li>Address of Employer: <i>[insert street/city/country]</i></li> <li>Reason(s) for non-performance: <i>[indicate main reason(s)]</i></li> </ul>	<i>[insert amount]</i>

**2. Pending Litigation**

<b>Pending Litigation</b>				
<input type="checkbox"/> No pending litigation in accordance with the Prequalification criteria, or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.2, as appropriate.				
<input type="checkbox"/> Pending litigation in accordance with the Prequalification criteria, or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.2, as appropriate, is indicated below:				
<b>Year of dispute</b>	<b>Amount in dispute (currency)</b>	<b>Outcome as Percentage of Net Worth</b>	<b>Contract Identification</b>	<b>Total Contract Amount (current value, currency, exchange rate and USD equivalent)</b>
[insert year]	[insert amount]	[insert percentage]	<ul style="list-style-type: none"> <li>Contract Identification: [indicate complete Contract name, number, and any other identification]</li> <li>Name of Employer: [insert full name]</li> <li>Address of Employer: [insert street/ city/country]</li> <li>Matter in dispute: [indicate main issues in dispute]</li> <li>Status of dispute: [indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary]</li> </ul>	[insert amount]

**3. Litigation History**

<b>Litigation History</b>		
<input type="checkbox"/> No court/arbitral award decisions against the Bidder since 1 <sup>st</sup> January [insert year], in accordance with the Prequalification criteria, or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.3, as appropriate.		
<input type="checkbox"/> Court/arbitral award decisions against the Bidder since 1 <sup>st</sup> January [insert year], in accordance with the Prequalification criteria, or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.3, as appropriate, are indicated below:		
<b>Year of award</b>	<b>Contract Identification</b>	<b>Total Contract Amount (current value, currency, exchange rate and USD equivalent)</b>
[insert year]	<ul style="list-style-type: none"> <li>Contract Identification: [indicate complete Contract name, number, and any other identification]</li> <li>Name of Employer: [insert full name]</li> <li>Address of Employer: [insert street/city/country]</li> <li>Matter in dispute: [indicate main issues in dispute]</li> <li>Party who initiated the dispute: [indicate "Employer" or "Contractor"]</li> <li>Status of dispute: [indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary]</li> </ul>	[insert amount]

**FORM FIN - 1: FINANCIAL SITUATION**

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

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

Joint Venture Party Legal Name: [insert full name]

IFB No.: [insert number]

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

**1. Financial data**

Type of Financial information in (currency)	Historic information for previous [insert number] years (amount, currency, exchange rate, USD equivalent)				
	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Statement of Financial Position (Information from Balance Sheet)</b>					
Total Assets (TA)					
Total Liabilities (TL)					
Net Worth (NW)					
Current Assets (CA)					
Current Liabilities (CL)					
<b>Information from Income Statement</b>					
Total Revenue (TR)					
Profits Before Taxes (PBT)					
Profits After Taxes (PAT)					

## 2. Financial documents

The Bidder and its Parties shall provide copies of the financial statements for [*number of years*] years pursuant to the Prequalification Criteria or Section III, Evaluation and Qualifications Criteria, Sub-factor 2.3.1. The financial statements shall:

- (a) Reflect the financial situation of the Bidder or in case of JV member, of each member, and not an affiliated entity (such as parent company or group member).
  - (b) Be independently audited or certified in accordance with local legislation.
  - (c) be complete, including all notes to the financial statements.
  - (d) correspond to accounting periods already completed and audited.
- ☐ Attached are copies of financial statements<sup>2</sup> for the [*number of years*] years required above; and complying with the requirements.

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<sup>2</sup> If the most recent set of financial statements is for a period earlier than 12 months from the date of Bid, the reason for this should be justified.

**FORM FIN - 2: AVERAGE ANNUAL TURNOVER**

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

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

Joint Venture Party Legal Name: [insert full name]

IFB No.: [insert number]

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

Annual Turnover Data (Construction only)			
Year	Amount and Currency	Exchange rate	USD equivalent
[indicate year]	[insert amount and indicate currency]	[insert applicable exchange rate]	[insert amount in USD equivalent]
<b>Average Annual Turnover<sup>1</sup></b>			
Average Annual turnover includes Construction, Equipment & O&M Turnover			

Notes for the Bidders:

1. Total USD equivalent for all years divided by the total number of years, in accordance with Section III, Qualification Criteria, Sub-Factor 3.2.
2. Copy of the Audited Annual Financial statement in complete shape including notes for the above years to be submitted for the years corresponding to years in above table.

**FORM FIN - 3: FINANCIAL RESOURCES**

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

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

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

Joint Venture Party Legal Name: *[insert full name]*

IFB No.: *[insert number]*

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

*[Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject Contract or Contracts as indicated in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2, as appropriate.]*

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

**FORM FIN - 4: CURRENT CONTRACT COMMITMENTS**

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

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

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

Joint Venture Party Legal Name: *[insert full name]*

IFB No.: *[insert number]*

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

*[Bidders and each member of a JV should provide information on their current commitments on all Contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for Contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued, in accordance with Section III, Evaluation and Qualification Criteria, Clause 2.2, as appropriate.]*

Current Contract Commitments					
No.	Name of Contract	Employer's Contact Address, Tel, Fax	Value of Outstanding Work [Current USD Equivalent]	Estimated Completion Date	Average Monthly Invoicing Over Last Six Months [USD/month]
1					
2					
3					
4					
5					



## FORM FIN - 5: FINANCIAL PERFORMANCE

[The following table shall be filled in for the Applicant and for each JV member if the Applicant is a JV.]

Date: [insert day, month, year]

Applicant's Legal Name: [insert full name]

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

Tender No. [insert number]

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

### To Whom So Ever It May Concern

This is to certify that our Firm (name of the Applicant / JV member) is currently not in the process of financial restructuring under Corporate Debt Restructuring (CDR) i.e., at the time of the proposal submission and up till the contract award (in case, our firm is chosen for contract award).

Duly Signed by the Company Secretary as well as the Authorized Signatory.

## FORM ACK

### Acknowledgement of Compliance with Guidelines for Procurement under Japanese ODA Loans

A) I, [insert name and position of authorized signatory], being duly authorized by [insert name of Bidder/members of joint venture ("JV")] (hereinafter referred to as the "Bidder") to execute this Acknowledgement of Compliance with Guidelines for Procurement under Japanese ODA Loans, hereby certify on behalf of the Bidder and myself that all information provided in the Bid submitted by the Bidder for [insert Loan No and name of the Project] is true, correct and accurate to the best of the Bidder's and my knowledge and belief. I further certify, on behalf of the Bidder, that:

- (i) the Bid has been prepared and submitted in full compliance with the terms and conditions set forth in the Guidelines for Procurement under Japanese ODA Loans (hereinafter referred to as the "Guidelines"); and
- (ii) the Bidder has not, directly or indirectly, taken any action which is or constitutes a corrupt, fraudulent, collusive or coercive act or practice in violation of the Guidelines and is not subject to any conflict of interest as stipulated in the relevant section of the Guidelines.

- B) <If debarment for more than one year by the World Bank Group is NOT imposed, use the following sentence B).>
- C) I certify that the Bidder has NOT been debarred by the World Bank Group for more than one year since the date of issuance of Invitation for Bids<sup>3</sup>.

<If debarment for more than one year by the World Bank Group has been imposed BUT three (3) years have passed since the date of such debarment decision, use the following sentence B').>

- B') I certify that the Bidder has been debarred by the World Bank Group for a period more than one year BUT that on the date of issuance of Invitation for Bids at least three (3) years had passed since the date of such debarment decision. Details of the debarment are as follows:

name of the debarred firm	starting date of debarment	ending date of debarment	reason for debarment

- D) I certify that the Bidder will not enter into a subcontract with a firm which has been debarred by the World Bank Group for a period more than one year, unless on the date

<sup>3</sup>The starting date should be revised to "request for price quotation," if the Borrower is selected through the International Shopping"; to "appointment", if a contractor is selected through the Direct Contracting; or "Commencement of actual selection/bidding process", if the Borrower wishes to adopt procurement procedures other than ICB, Limited International Shopping, International Shopping, or Direct Contracting.

of the subcontract at least three (3) years have passed since the date of such debarment decision.

- E) I certify, on behalf of the Bidder, that if selected to undertake services in connection with the Contract, the Bidder shall carry out such services in continuing compliance with the terms and conditions of the Guidelines.
- F) I further certify, on behalf of the Bidder, that if the Bidder is requested, directly or indirectly, to engage in any corrupt or fraudulent action under any applicable law, such as the payment of a rebate, at any time during a process of public procurement, negotiations, execution or implementation of contract (including amendment thereof), the Bidder shall report all relevant facts regarding such request to the relevant section in JICA (details of which are specified below) in a timely manner.

JICA's information desk on fraud and corruption (A report can be made to either of the offices identified below.)

- (1) **JICA Headquarters:** Legal Affairs Division, General Affairs  
Department URL: <https://www2.jica.go.jp/en/odainfo/index.php>  
Tel: +81 (0)3 5226 8850
- (2) **JICA Delhi office**  
16thFloor, Hindustan Times Building, Kasturba Gandhi Marg  
New Delhi 110 001  
Tel: +91-11-4909-7000

The Bidder acknowledges and agrees that the reporting obligation stated above shall NOT in any way affect the Bidder's responsibilities, obligations or rights, under relevant laws, regulations, contracts, guidelines or otherwise, to disclose or report such request or other information to any other person(s) or to take any other action, required to or allowed to, be taken by the Bidder. The Bidder further acknowledges and agrees that JICA is not involved in or responsible for the procurement process in any way.

- G) If any of the statements made herein is subsequently proven to be untrue or incorrect based on facts subsequently determined, or if any of the warranties or covenants made herein is not complied with, the Bidder will accept, comply with, and not object to any remedies taken by the Employer and any sanctions imposed by or actions taken by JICA.

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**Authorized Signatory**

[Insert name of signatory; title]

**For and on behalf of** [Insert name of the Bidder] Date:

## FORM OF BID SECURITY (BANK GUARANTEE)

[Guarantor letterhead or SWIFT identifier code]

**Beneficiary:** [Employer to insert its name and address]

**IFB No.:** [Employer to insert number of Invitation for Bids]

**Date:** [insert date of issue]

**BID GUARANTEE No.:** [insert guarantee reference number]

**Guarantor:** [insert name and address of place of issue, unless indicated in the letterhead]

We have been informed that [insert name of the Bidder, which in the case of a joint venture shall be the name of the joint venture (whether legally constituted or prospective) or the names of all members thereof] (hereinafter called “the Applicant”) has submitted or will submit to the Beneficiary its Bid (hereinafter called “the Bid”) for the execution of [insert description of Contract] under Loan Agreement No. [insert Loan Agreement Number].

Furthermore, we understand that, according to the Beneficiary’s conditions, Bids must be supported by irrevocable bid guarantee.

At the request of the Applicant, we, as Guarantor, hereby absolutely, unconditionally and irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of [insert amount in words, (insert amount in figures)] upon receipt by us of the Beneficiary’s complying demand, supported by the Beneficiary’s statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:

- (a) has withdrawn its Bid during the period of Bid validity set forth in the Applicant’s Letter of Bid (hereinafter called “the Bid Validity Period”), or any extension thereto provided by the Applicant; or
- (b) having been notified of the acceptance of its Bid by the Beneficiary during the Bid Validity Period or any extension thereto provided by the Applicant, (i) fails to execute the Contract Agreement, or (ii) fails to furnish the Performance Security, in accordance with the Instructions to Bidders of the Beneficiary’s Bidding Documents.

This guarantee will expire and shall be returned to the Applicant: (a) if the Applicant is the successful Bidder, upon our receipt of copies of the Contract Agreement signed by the Applicant and the Performance Security issued to the Beneficiary in relation to such Contract Agreement; or (b) if the Applicant is not the successful Bidder, upon the earlier of (i) our receipt of a copy of the Beneficiary’s notification to the Applicant of the results of the bidding process; or (ii) twenty-eight (28) days after the end of the Bid Validity Period.

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

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458<sup>4</sup>.

[signature(s)]

[Note: All italicized text is for use in preparing this form and shall be deleted from the final product.]

<sup>4</sup> As the case may be, ICC Publication No. 758 (or subsequent ICC Publications) may be used. In such cases, modify the Publication number

## **Section V. Eligible Source Countries of Japanese ODA Loans**

*[Specify the Eligible Source Countries.]*

# **PRICE PROPOSAL**

## **PART-1 (A)**

### **400 MLD CHENNAI SEAWATER DESALINATION PROJECT, PERUR, CHENNAI**

**PREAMBLE TO PRICE SCHEDULES**

1. The Pricing Document shall be read in conjunction with Notice of Invitation to Tender (NIT), Instructions to Bidders and all Tender Documents, Specifications and Drawings as listed in Sub-Clause 6.1 of Instructions to Bidders.
2. The Contract is a lump sum priced Contract, adjusted by the Price Variation Formula detailed in Clause 13 of Particular Condition of Contract, Part 3. The Works are divided into Price Schedules each representing one or more groups of inter-related works forming part of the Works. These price schedules shall cover the full compensation of the Contractor to design, construct, manufacture, supply, install, erect, prepare the project documents, commission, perform the tests on completion, defect liability, operate and maintain during the operating period etc. all scopes of works in strict conformity with the Contract documents.
3. The individual item descriptions within each Price Schedules are indicative only of the Works included in this Contract and shall not be taken as defining the scope of work to be executed either under the Price Schedules or the Contract.
4. The item descriptions, if given, are general summaries only, therefore no omission from, or error in, item descriptions within this Pricing Document shall warrant an adjustment of the Contract Price nor entitle the Contractor to seek an extension of time under the Contract.
5. The lump sum for each Price Schedule shall be held to include all costs on materials, duties, landing charges, shipping costs for transport by air, sea or land (or any combination thereof), insurance, import taxes and duties, unloading, storage, getting into position, hoisting, lowering, distributing to positions, fixing, labour, materials, scaffolding and staging, plant, supervision, overhead charges, profit, making good prior to handing over to the Employer at the project site and anything reasonably to be inferred from the description of the item and indispensably necessary thereto.
6. The activity descriptions for items within Price Schedules shall be deemed to cover all aspects of the relevant item scope, irrespective of the fact that the Contractor may not have inserted an amount against any item description. The Price Value of each Price Schedule shall be deemed inclusive of all of the Contractor's obligations to execute the part of the Works covered by the Price Schedule and to perform all of his other obligations under the Contract in respect thereof. Additional rows have been provided in Price Schedules under each Price Centre to include additional items to be executed to complete the works fully to operate the 400 MLD plant smoothly. The Contractor shall not be entitled to receive any further or additional payment in respect of such Price Centers and Price Schedules.
7. The Schedule of Prices is divided into separate Schedules as follows:  
  
Schedule No. 1: Survey & Investigations, Design, Drawings and Documentation  
  
Schedule No. 2: Intake and Outfall Pipeline Works  
  
Schedule No. 3: Civil Works  
  
Schedule No. 4: Mechanical Works  
  
Schedule No. 5: Electrical and ICA Works

Schedule No. 6: Miscellaneous Works

Schedule No. 7: Process Proving

Schedule No. 8: Summary of CAPEX Price

Schedule No. 9: Operation & Maintenance

Schedule No. 10: Summary of OPEX Price

Schedule No. 11: Grand Summary of Price Schedules (CAPEX + OPEX)

Schedule No. 12: Laboratory Chemicals Price

Schedule No. 13: Workshop Items Price

Schedule No. 14: Chemicals Price during O&M Period

Schedule No. 15: Manpower Price during O&M Period

Schedule No. 16: Asset Replacement Price during O&M Period

Schedule No. 17: Membrane Replacement Price during O&M Period

Schedule No. 18: Payment Terms

8. The Schedules do not generally give a full description of the Construction details, Plant and Materials to be supplied and the services to be performed under each item. The entered rates and prices shall be deemed to include for the full compliance with all provisions of the conditions of the Contract.
9. Schedule No.8 includes all the cost for the supply, construction, installation, erection, commissioning and testing including process proving test. All the cost of associated civil, mechanical, electrical, ICA and other construction work, items and materials as per contract are to be included under this schedule.
10. The Contactor is required to quote price for each and every item in the price schedule. The items and their quantities in this Price Schedule document are indicative only based on the Employer's experience. The Contractor may add the additional items to be costed as given in the schedules under "any other works" to complete the works fully functional as per the contract. He shall quote items and quantities sufficient to cover all plant exigencies to achieve the specified performance of the 400 MLD SWRO desalination plant.
11. The Contractor is to fill the Prices in the Price Schedule (1-17) and provide the soft copy and hard copy of the excel sheet duly signed and sealed along with the price bid.
12. If the applicant is JV, the JV agreement should be registered in Chennai as per the prevailing registration act to the condition of registration department after award of the contract. The cost of the JV registration shall be separately quoted in the Schedule 6 Miscellaneous Items.
13. The Contractor shall provide all the spare parts supplied by the Manufacturer along with the new equipment purchased at the end of the contract.



**Declaration Sheet**

## DECLARATION SHEET

I, the undersigned, .....certify that all the data furnished in preceding schedules and information pertaining to Part-I, Part II and Part-III of this specification are correct and representation of the offer covered by our Bid Proposal No. .... dated ..... I hereby certify that I am duly authorized representative of the bidder whose name appears above my signature.

Bidder's Name \_\_\_\_\_

Authorized representative's Signature \_\_\_\_\_

Authorized representative's Name \_\_\_\_\_

Bidder's Intent:

The Bidder hereby agrees to comply with the requirements and intent of this specification for the price indicated.

Seal of Company

Signature of the Bidder \_\_\_\_\_

Name & Address of the Bidder \_\_\_\_\_

Date : \_\_\_\_\_

\* Note : In case of consortium all the members should sign the bid proposal.

**Summary of the Contract Price**

Description	Total Price Local Currency (INR)			Total Price Foreign Currency (USD)		
	Base Cost	GST	Total Local Cost*	Base Cost	Custom Duty	Total Foreign Cost*
	A	B	C=(A+B)	D	E	F=(D+E)
Schedule No. 1: Surveys & Investigations, Design, Drawings and Documentation (A)						
Schedule No. 2: Intake and Outfall Pipeline (B)						
Schedule No. 3: Civil Works (C)						
Schedule No. 4: Mechanical Works (D)						
Schedule No. 5: Electrical and ICA Works (E)						
Schedule No. 6: Miscellaneous Works (F)						
Schedule No. 7: Process Proving (G)						
Schedule No. 8: Summary of CAPEX Price (H=A+B+C+D+E+F+G)						
Schedule No. 9: Operation & Maintenance for 20 years (I)						
Schedule No. 10: Summary of OPEX Price (J)						
Schedule No. 11: Grand Summary of CAPEX & OPEX Price (K=H+J)						

\* Total Price includes all costs including freight, port storage, insurance, and taxes/duties/stamps for delivery on the project site.

Signature of Bidder : \_\_\_\_\_

Name : \_\_\_\_\_

Designation : \_\_\_\_\_

Place : \_\_\_\_\_

Date : \_\_\_\_\_

Company Name and Seal

**Schedule 1: Surveys & Investigations, Design, Drawings and Documentation**

The total cost of the Schedule No. 1. (Plant design, detailed engineering, drawings. Estimation etc.) should not exceed 1.50% of the sum of price of Schedule 2 to Schedule 7.

To include, but not limited to, the following items to deliver the project fit for purpose.

Item No.	Description for 400 MLD Plant	Quantity 2x200 MLD	Base Cost (INR)	GST (INR)	Total Price (INR)* (F)=(D)+(E)
A	B	C	D	E	F
<b>1.1</b>	<b>Survey, Process, Design and Drawings</b>				
1.1.1	Site survey, Bathymetric study, brine diffusion study and Subsoil investigations	LS			
1.1.2	PFD, Mass balance, Process design calculations and P&IDs	LS			
1.1.3	Site layout plan, General arrangement drawings, Hydraulic diagram, Architectural drawings and Site grading plan	LS			
1.1.4	Site drainage, Yard piping, Ext. plumbing etc.	LS			
1.1.5	Single line diagrams, Substations and Electrical drawings	LS			
1.1.6	Instrumentation & Control Systems	LS			
1.1.7	Functional Design Specification (FDS)	LS			
1.1.8	Ancillary Works	LS			
1.1.9	Any other works, as required (Items should be specified)	LS			
	<b>Sub Total Schedule 1.1</b>				
<b>1.2</b>	<b>Civil Structural Designs and Drawings</b>				
1.2.1	Intake and Outfall structures including headers and diffusers	LS			
1.2.2	Intake Pumping station including band screen and pumps	LS			
1.2.3	Pre-treatment Chemical Buildings + Tanks Storage area	LS			
1.2.4	Flash mixing and flocculation	LS			
1.2.5	Lamella Settlers	LS			
1.2.6	DAFs	LS			
1.2.7	DMFs, Backwash tanks and Pump houses	LS			
1.2.8	RO Buildings and ancillary structures	LS			
1.2.9	RO Chemical Buildings	LS			
1.2.10	Permeate tanks and Neutralization tanks	LS			
1.2.11	Remineralization buildings and associate system	LS			
1.2.12	Product Water Tanks	LS			
1.2.13	Clear Water Tank	LS			
1.2.14	Post Treatment Chemical Buildings	LS			
1.2.15	Waste Sludge Balancing Tank with pumping system	LS			
1.2.16	Gravity Thickeners	LS			

Item No.	Description for 400 MLD Plant	Quantity 2x200 MLD	Base Cost (INR)	GST (INR)	Total Price (INR)* (F)=(D)+(E)
A	B	C	D	E	F
1.2.17	Sludge Holding Tank and thickened sludge Pump House	LS			
1.2.18	Sludge Treatment Building (BFP Building, along with polymer dosing systems and BFP feed pumping system)	LS			
1.2.19	Administrative Building	LS			
1.2.20	Control Building with Laboratory	LS			
1.2.21	Warehouse and Workshop	LS			
1.2.22	Sub Stations & Electrical buildings	LS			
1.2.23	Firefighting and Security buildings	LS			
1.2.24	Sewage treatment building	LS			
1.2.25	All yard piping at project site	LS			
1.2.26	Ancillary works and any other works, as required (Items should be specified)	LS			
	<b>Sub Total Schedule 1.2</b>				
<b>1.3</b>	<b>Mechanical System Designs and Drawings</b>				
1.3.1	Intake Screen and Intake Pumps and Sluice gates	LS			
1.3.2	Flash mixers, flocculators, tube settlers, valves, gates and dismantling joints at inlet structure, flocculation and Lamella Settlers	LS			
1.3.3	Pumps, valves, gates, dismantling joints at DAF	LS			
1.3.4	Backwash pumps at DMF	LS			
1.3.5	Filter media, valves, gates, piping and underdrain system at DMFs	LS			
1.3.6	All mechanical equipment at pretreatment	LS			
1.3.7	All mechanical equipment including valves, gates, dismantling joints at RO Feed Tank	LS			
1.3.8	All mechanical equipment at RO system	LS			
1.3.9	All mechanical equipment at RO chemical	LS			
1.3.10	All mechanical equipment at CO2 system	LS			
1.3.11	All mechanical equipment at Limestone Filters	LS			
1.3.12	All mechanical equipment at post treatment chemical buildings	LS			
1.3.13	Valves, gates, dismantling joints at Product Water Tanks	LS			
1.3.14	Valves, gates, dismantling joints at CWR	LS			
1.3.15	Sludge Balancing Tank with Submersible Pumps	LS			
1.3.16	All mechanical equipment at Sludge Thickener	LS			
1.3.17	All mechanical equipment at Thickened Sludge Holding Tank	LS			
1.3.18	All mechanical equipment at Belt Filter Press including Feed Pumps	LS			
1.3.19	Belt Filter Press and polymer dosing system	LS			
1.3.20	Sludge conveyance system	LS			
1.3.21	Sewage treatment system	LS			

Item No.	Description for 400 MLD Plant	Quantity 2x200 MLD	Base Cost (INR)	GST (INR)	Total Price (INR)* (F)=(D)+(E)
A	B	C	D	E	F
1.3.22	Ancillary works and any other works, as required (Items should be specified)	LS			
	<b>Sub Total Schedule 1.3</b>				
<b>1.4</b>	<b>Electrical Designs and Drawings</b>				
1.4.1	Electrical Load List	LS			
1.4.2	Typical Earthing Details	LS			
1.4.3	Typical Lighting Fixture Details	LS			
1.4.4	Sludge treatment system	LS			
1.4.5	Relay coordination	LS			
1.4.6	Single Line Diagram	LS			
1.4.7	110 kV/11 kV Transformer Sizing Calculation	LS			
1.4.8	11 kV/0.433 kV Transformer Sizing Calculation	LS			
1.4.9	HV, MV & LV switchboard detailed design	LS			
1.4.10	Capacitor Bank Sizing Calculation	LS			
1.4.11	Voltage Drop & Cable Sizing Calculation	LS			
1.4.12	Battery Charger Sizing Calculation	LS			
1.4.13	Voltage Dip Calculation for Starting of Highest Rating Motor on 11 kV/0.433 kV Transformer	LS			
1.4.14	Cable Routing & Trays Layout Drawing	LS			
1.4.15	Earthing layout Drawing	LS			
1.4.16	Lighting Layout Drawing - buildings & Site	LS			
1.4.17	Power & Control Cable Schedule	LS			
1.4.18	Electrical Equipment data Sheet	LS			
1.4.19	Local Control Panel details	LS			
1.4.20	Substation GA Drawing	LS			
1.4.21	Switchgear Room GA Drawing	LS			
1.4.22	PMCC Room GA Drawing	LS			
1.4.23	MCC Room GA Drawing	LS			
1.4.24	Equipment layout design drawings	LS			
1.4.25	Heat dissipation, AC and ventilation system sizing	LS			
1.4.26	Any other works, as required (Items should be	LS			
	<b>Sub Total Schedule 1.4</b>				
<b>1.5</b>	<b>Instrumentation, Control &amp; Automation</b>				
1.5.1	Instrument Schedule	LS			
1.5.2	PLC IO List	LS			
1.5.3	PLC System configuration	LS			
1.5.4	Instrument control panel design drawings	LS			
1.5.5	Instrument data sheets	LS			
1.5.6	General Arrangement of PLC Panels	LS			
1.5.7	PLC system Power & Control Schematics	LS			
1.5.8	PLC system BOM	LS			
1.5.9	DCS system graphic designs	LS			
1.5.10	Block Logic Diagram	LS			
1.5.11	PLC and DCS System FAT Procedure	LS			

Item No.	Description for 400 MLD Plant	Quantity 2x200 MLD	Base Cost (INR)	GST (INR)	Total Price (INR)* (F)=(D)+(E)
A	B	C	D	E	F
1.5.12	Instrument Cable Schedule	LS			
1.5.13	GA of Junction Boxes	LS			
1.5.14	GA of Pneumatic Control Boxes	LS			
1.5.15	Field instrument layout drawings	LS			
1.5.16	Instrument Hook ups	LS			
1.5.17	Any other works, as required (Items should be specified)	LS			
	<b>Sub Total Schedule 1.5</b>				
<b>1.6</b>	<b>As Built Drawing</b>				
1.6.1	Civil & Building works	LS			
1.6.2	Mechanical systems	LS			
1.6.3	Electrical system	LS			
1.6.4	Control, Instrumentation & Automation system	LS			
1.6.5	Any other ancillary system	LS			
	<b>Sub Total Schedule 1.6</b>				
<b>1.7</b>	<b>Other Documentation</b>				
1.7.1	Process Design Basis Report	LS			
1.7.2	Design Basis Report - Electrical	LS			
1.7.3	Operation & Maintenance Manuals including Trouble Shooting	LS			
1.7.4	Training Programme and Manuals	LS			
1.7.5	Design and Process Details with excel sheets	LS			
1.7.6	Standard Operating Procedures	LS			
1.7.7	Any other document, as required	LS			
	<b>Sub Total Schedule 1.7</b>				
<b>1.8</b>	<b>Bidder shall list here details of additional items required for the complete plant design, drawing and documentation as per the Contract.</b>	LS			
<b>1.9</b>	<b>Summary of Schedule 1</b>				
	<i>Schedule 1 (Total Carried to Schedule 8, Grand Summary)</i>				

\* The Price includes all taxes and Duties.

The base cost should inclusive of all cost excluding GST.

*Signature of Bidder*

*Name & Designation*

*Company Name and Seal*

**Schedule 2: Intake and Outfall Pipeline**

To include, but not limited to the following items to deliver the works from supply to commissioning fit for the purpose as per the Contract Specifications.

Item No.	Description of Intake and Outfall Pipeline Items for Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
<b>2.1</b>	<b>Intake and Outfall (400 MLD)</b>								
2.1.1	Supply of 2500 mm OD HDPE pipelines and all works for laying of twin Intake pipelines for the length of 1150 m offshore	Lot							
2.1.2	Supply and Fixing of Offshore Velocity Cap type Heads (2 No.) with all allied works such as fish net, boulders, manholes, etc. at offshore intake. Two Screen made of Duplex Steel Frame and Cu-Ni Screen with 100 mm C/c opening	Lot							
2.1.3	Supply of 2500 mm OD HDPE pipelines and all works for laying of Outfall pipeline for the length of 750 m Offshore	Lot							
2.1.4	Supply and Fixing of Offshore Diffusers and all allied works at brine outfall. Diffuser made of Super Duplex Steel.	Lot							
2.1.5	Any other works to provide complete intake and outfall piping system (Items should be specified)	Lot							
	<b>Total Schedule 2 (to be carried to Schedule 8)</b>								

\* The Price includes all taxes and Duties.

Note: For offshore works, (Intake and outfall) payment will be made based on the actual pipe length supplied and laid.

The base cost should be inclusive of all costs excluding GST/Custom.

*Signature of Bidder*

*Name & Designation*

*Company Name and Seal*

**Schedule 3: Civil Works**

To include, but not limited to the following items to deliver the works from supply to commissioning fit for the purpose as per the Contract Specifications.

S. No.	Part	Supply & Construction, Testing, Commissioning of Civil Works for 2 x 200 MLD Plant	Quantity 2x200 MLD	Base Cost (INR)	GST (INR)	Total Price (INR)* (F)=(D)+(E)
A	B		C	D	E	F
<b>3.1</b>	<b>Intake and Outfall Structures</b>					
	3.1.1	Supply, construction and commissioning of complete Intake Pumping Station including intake well, band screen area, pump area, discharge piping, flash mixer tank to flocculation system	Lot			
	3.1.2	Supply, construction and commissioning of structures associated with Pigging System	Lot			
	3.1.3	Supply, construction and commissioning of Outfall tank	Lot			
	3.1.4	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.1</b>					
<b>3.2</b>	<b>Shock Chlorination and Air Impingement System</b>					
	3.2.1	Supply, construction and commissioning of Building for shock chlorination dosing pumps, air compressors and air vessels with Hypochlorite storage tank.	Lot			
	3.2.2	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.2</b>					
<b>3.3</b>	<b>Chemical Building for Pre-treatment</b>					
	3.3.1	Supply, construction and commissioning of Chemical Building for pre-treatment with solution preparation tanks, dosing tanks area and storage area for solid chemicals and dosing pumps area for FeCl <sub>3</sub> , polymer, acid and hypochlorite, bunds, overhead service water tank etc. and other facilities as required.	Lot			
	3.3.2	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.3</b>					
<b>3.4</b>	<b>Coagulation and Flocculation System</b>					
	3.4.1	Supply, construction and commissioning of Inlet-structure with baffles, flash mixing chambers with weirs, piping, valve & flowmeter chambers and walkway, handrails etc. as applicable	Lot			
	3.4.2	Supply, construction and commissioning of Flocculation Chambers with hopper drain system, walkway platform, handrails etc. as per Contract and complete in all respect.	Lot			



S. No.	Part	Supply & Construction, Testing, Commissioning of Civil Works for 2 x 200 MLD Plant	Quantity 2x200 MLD	Base Cost (INR)	GST (INR)	Total Price (INR)* (F)=(D)+(E)
A	B		C	D	E	F
	3.4.3	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.4</b>					
<b>3.5</b>	<b>Lamella Settler</b>					
	3.5.1	Supply, construction and commissioning of Lamella Clarifier with tube settlers, hoppers drain system, walkway platform, handrails, pipes, valve & flowmeter chambers etc. as per Contract and complete in all respect.	Lot			
	3.5.2	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.5</b>					
<b>3.6</b>	<b>DAF</b>					
	3.6.1	Supply, construction and commissioning of DAF structure and building along with tanks, pipes, valve & flowmeter chambers and complete system as per the Contract.	Lot			
	3.6.2	Any other works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.6</b>					
<b>3.7</b>	<b>GDMF</b>					
	3.7.1	Supply, construction and commissioning of GDMF structure and building along with media tanks, underdrain system, pipes, valve & flowmeter chambers, inlet channel, filtrate channel and complete system in all respect as per the contract	Lot			
	3.7.2	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.7</b>					
<b>3.8</b>	<b>DMF Backwash and RO Feed Tank</b>					
	3.8.1	Supply, construction and commissioning of DMF backwash and RO feed tank structures, pumps and blower chambers, RO feed pumping station, any other tanks and valve/flowmeter chambers along with structure as needed.	Lot			
	3.8.2	Any other works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.8</b>					
<b>3.9</b>	<b>RO System</b>					
	3.9.1	Supply, construction and commissioning of Industrial Steel Structures to inhouse RO system along with CIP system with chemical storage and dosing system, MCC and all other areas as per the Contract.	Lot			
	3.9.2	Supply, construction and commissioning of permeate tanks as per the Contract.	Lot			

S. No.	Part	Supply & Construction, Testing, Commissioning of Civil Works for 2 x 200 MLD Plant	Quantity 2x200 MLD	Base Cost (INR)	GST (INR)	Total Price (INR)* (F)=(D)+(E)
A	B		C	D	E	F
	3.9.3	Supply, construction and commissioning of neutralization tanks as per the Contract.	Lot			
	3.9.4	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.9</b>					
<b>3.10</b>	<b>Chemical Building for RO System</b>					
	3.10.1	Supply, construction and commissioning of Chemical Building with all chemical tanks and overhead service water tank and with sufficient area to accommodate all the dosing system, bunds, drain etc. and all other features.	Lot			
	3.10.2	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.10</b>					
<b>3.11</b>	<b>Post Treatment System</b>					
	3.11.1	Supply, construction and commissioning of CO2 storage areas with all pipes, valve/flowmeter chambers and any other structure as needed.	Lot			
	3.11.2	Supply, construction and commissioning of RCC Limestone Filter structure with areas for limestone storage and feeding, all pipes, valve/flowmeter chambers and any structure as needed.	Lot			
	3.11.3	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.11</b>					
<b>3.12</b>	<b>Chemical Building for Post Treatment</b>					
	3.12.1	Supply, construction and commissioning of Chemical Building with all the post treatment chemical tanks and overhead service water tank and with sufficient area to accommodate dosing system, bunds, drain, etc. and all other features.	Lot			
	3.12.2	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.12</b>					
<b>3.13</b>	<b>Waste /Sludge Treatment and Conveyance System</b>					
	3.13.1	Supply, construction and commissioning of Waste Sludge Balance Tank	Lot			
	3.13.2	Supply, construction and commissioning of Gravity Thickeners	Lot			
	3.13.3	Supply, construction and commissioning of Thickened Sludge Holding tanks	Lot			
	3.13.4	Supply, construction and commissioning of Sludge treatment building (BFP building), with sludge feed pump area, chemical storage and dosing areas and all other areas as required.	Lot			

S. No.	Part	Supply & Construction, Testing, Commissioning of Civil Works for 2 x 200 MLD Plant	Quantity 2x200 MLD	Base Cost (INR)	GST (INR)	Total Price (INR)* (F)=(D)+(E)
A	B		C	D	E	F
	3.13.5	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.13</b>					
	<b>3.14 Product Water Tanks</b>					
	3.14.1	Supply, construction and commissioning of Product Water Tanks with air HEPA filters and watertight cover lids	Lot			
	3.14.2	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.14</b>					
	<b>3.15 Clear Water Reservoir</b>					
	3.15.1	Supply, construction and commissioning of RCC Clear Water Tank with air HEPA filters and watertight cover lids	Lot			
	3.15.2	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.15</b>					
	<b>3.16 Electrical Building and MCC for complete plant</b>					
	3.16.1	Supply, construction and commissioning of substation building including Switchyard & Transformer area	Lot			
	3.16.2	Supply, construction and commissioning of MCC Rooms for complete plant including Diesel Generator Room	Lot			
	3.16.3	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.16</b>					
	<b>3.17 Administration, Laboratory and Control Buildings</b>					
	3.17.1	Supply, construction and commissioning of Administrative building including Canteen area and guest house	Lot			
	3.17.2	Supply and Construction of Plant Control and Laboratory building	Lot			
	3.17.3	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.17</b>					
	<b>3.18 Warehouse and Workshop</b>					
	3.18.1	Supply, construction and commissioning of Ware-house - Industrial Steel Structure	Lot			
	3.18.2	Supply, construction and commissioning of Workshop - Industrial Steel Structure	Lot			
	3.18.3	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.18</b>					
	<b>3.19 Sewage Treatment Plant</b>					
	3.19.1	Supply, construction and commissioning of sewage treatment plant Building	Lot			

S. No.	Part	Supply & Construction, Testing, Commissioning of Civil Works for 2 x 200 MLD Plant	Quantity 2x200 MLD	Base Cost (INR)	GST (INR)	Total Price (INR)* (F)=(D)+(E)
A	B		C	D	E	F
	3.19.2	Supply, construction and commissioning of all tanks for the treatment plants	Lot			
	3.19.3	Any other civil works (Items should be specified)	Lot			
	<b>Sub Total of Part 2.19</b>					
<b>3.20</b>	<b>Misc. Works at Site</b>					
	3.20.1	Supply, construction and commissioning of Parking lot, sign board, light, traffic signal, Site clearance, filling, removal of slurry to assigned quarry, temporary works etc., as specified	Lot			
	3.20.2	Supply of material and Backfilling of the plant site to bring uniform ground level at CD+6.50m excluding burial and area not included in the plant.	Lot			
	3.20.3	Supply, construction and commissioning of RCC retaining wall up to CD +6.50m and min 2.50m high Brick wall boundary around the plant site and burial ground sites	Lot			
	3.20.4	Supply, construction and commissioning of two Plant Gates and Security smart houses with cameras	Lot			
	3.20.5	Firefighting building and associated structures				
	3.20.5	Any other works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.20</b>					
<b>3.21</b>	<b>Roads and Drainage</b>					
	3.21.1	Supply and Construction of all Roads and paths etc. as specified at per the plant layout	Lot			
	3.21.2	Supply and Construction of Site storm water drainage system, both for the plant and burial grounds as required and Rainwater Harvesting structures.	Lot			
	3.21.3	Plantation, Landscaping as specified	Lot			
	3.21.4	All yard pipe works not covered above	Lot			
	3.21.5	Supply, construction and commissioning of Firefighting Rooms for complete plant	Lot			
	3.21.6	Any other works (Items should be specified)	Lot			
	<b>Sub Total of Part 3.21</b>					
<b>3.22</b>	<b>The Bidder shall list here details of any additional items (all area of the works) required in Civil Supply, Construction works for the Desalination Plant as per the Contract Specifications</b>					
	<b>Sub Total of Part 3.22</b>					

S. No.	Part	Supply & Construction, Testing, Commissioning of Civil Works for 2 x 200 MLD Plant	Quantity 2x200 MLD	Base Cost (INR)	GST (INR)	Total Price (INR)* (F)=(D)+(E)
A	B		C	D	E	F
	<b>Total Schedule 3</b>					
	<b>(Sub Total 3.1 to 3.22)</b>					
	<b>Schedule 3 (Total Carried to Schedule 8, Grand Summary)</b>					

\* The Price includes all taxes and duties.

The base cost should be inclusive of all costs excluding GST.

*Signature of Bidder*

*Name & Designation*

*Company Name and Seal*

**Schedule 4: Mechanical Works**

To include, but not limited to the following items to deliver the works from supply to commissioning fit for the purpose as per the Contract Specifications.

Item No.	Description of Mechanical Items for Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant	Unit	Qty	Local Supply			International Supply		
				Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
<b>4.1</b>	<b>Intake Pumping Station Area (400 MLD)</b>								
4.1.1	On shore Travelling band screen with 3mm mesh (4 x 33%)	Lot							
4.1.2	Vertical Turbine Intake Sea Water Pumps (6W+3S) made of Super Duplex with PREN≥41 including Electric Motor (s) complete with intake, outlet and nonreturn valves, dismantling joints, piping etc.	Lot							
4.1.3	Pigging Systems complete in all respect for intake pipeline cleaning with pig launching and receiving system having two Pigs	Lot							
4.1.4	Isolation Gates (Duplex Steel) for Intake and Outfall tanks	Lot							
4.1.5	Shock chlorination for offshore Heads including tanks, injection system, pumps, piping, valves and all allied items.	Lot							
4.1.6	Compressed air system including compressors, pressure vessels, piping etc. complete in all respect for offshore Heads	Lot							
4.1.7	Any other works to provide the complete system in the intake pumping station area (Items should be specified)	Lot							
<b>4.2</b>	<b>Pre-treatment Chemical Systems (2x200 MLD)</b>								

Item No.	Description of Mechanical Items for Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
4.2.1	98% Sulphuric Acid bulk Storage tanks: Cylindrical horizontal dished end carbon steel (IS 2062) tanks (2 tanks), internally ebonite Lined & externally coated with epoxy paint, complete with dosing tanks and dosing pumping system facility, transfer/unloading pumps, scrubbers, etc. and all other associated structures and features to complete the system.	Lot							
4.2.2	GRP tanks for FeCl <sub>3</sub> and hypochlorite bulk storage (2 tanks for each chemical for total 1 month storage) with transfer/onloading pumps and scrubbers, and all other associated structures and features to complete the system	Lot							
4.2.3	Hypochlorite dosing system with pumps, valves, strainers, and equipment complete in all respect for automatic chemical dosing as per the contract	Lot							
4.2.4	FeCl <sub>3</sub> dosing system with pumps, agitators, valves, strainers, EOT crane and equipment complete in all respect for automatic chemical dosing as per the contract	Lot							
4.2.5	Polymer dosing system with pumps, agitators, valves, strainers, EOT, powder polymer transfer system using ejector and equipment complete in all respect for	Lot							

Item No.	Description of Mechanical Items for Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
	automatic chemical dosing as per the contract								
4.2.6	Any other works to provide the complete system (Items should be specified)	Lot							
<b>4.3</b>	<b>Pre-treatment Process Units (2 x 200MLD)</b>								
4.3.1	Coagulation and flocculation system including flash mixer, flocculator mixers complete with all associated piping and valves, gates, sludge disposal facility etc.	Lot							
4.3.2	Lamella Settlers including all associated piping and valves, gates, sludge disposal facility etc.	Lot							
4.3.3	Dissolved Air Floatation, complete with pressurized vessel, recycle pumps and all associated valves, pipes, sludge disposal facility etc. in totality	Lot							
4.3.4	Gravity Dual Media Filtration, complete in totality including backwash pumps and blowers, and all associated valves and equipment required for its fully automated operations.	Lot							
4.3.5	Any other works to provide the complete system (Items should be specified)	Lot							
<b>4.4</b>	<b>DMF Backwash and RO Feed Tank (2 x 200 MLD)</b>								



Item No.	Description of Mechanical Items for Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
4.4.1	DMF backwash and RO feed-tank - complete in totality including all valves and gates along with any equipment needed as per the Contract.	Lot							
4.4.2	Any other works (Items should be specified)	Lot							
<b>4.5</b>	<b>RO Skids, Chemical Dosing and CIP System (2 x 200 MLD)</b>								
4.5.1	Cartridge Filters including housing and complete with all valves and piping, drain, vents, plugs, foundation bolts, leg supports, static mixers etc. for complete requirement in RO system	Lot							
4.5.2	RO skids/trains including all items to complete the skids	Nos.							
4.5.3	Reverse Osmosis 8" membranes	Nos.							
4.5.4	Pressure Vessel for RO membranes including Super Duplex coupling.	Nos.							
4.5.5	Antiscalant, SMBS, Caustic Soda and any other chemicals bulk storage tanks and dosing Systems including tanks, pumps, valves, strainers, piping, EOT crane and all other equipment complete in all respect for automated chemical dosing.	Lot							
4.5.6	RO Booster Pumps with Impeller, casing, shaft Super Duplex with PERN≥41. Motor, VFD complete with all piping and valves.	Nos.							

Item No.	Description of Mechanical Items for Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
4.5.7	RO high pressure pumps with impeller, casing, shaft Super Duplex (2507) with PERN $\geq$ 43. Motor, VFD complete with all piping and valves.	Nos.							
4.5.8	ERD Feed Pumps with Impeller, casing, shaft Super Duplex with PERN $\geq$ 41. Motor, VFD (if required) complete with all piping and valves.	Nos.							
4.5.9	ERD Recirculation Pumps with Impeller, casing, shaft Super Duplex with PERN $\geq$ 43. Motor, VFD (if required) complete with all piping and valves.	Nos.							
4.5.10	Energy Recovery Device –ERD) - pipe headers, flanges, U clamps, fasteners, Victaulic coupling for making connections complete in all respects including anchor foundation bolts etc.	Nos.							
4.5.11	Cleaning in Place (CIP) system complete in totality with heater, pumps, valves and piping etc. and all equipment needed for fully automated process.	Lot							
54.5.12	Any other works to provide the complete system (Items should be specified)	Lot							
<b>4.6</b>	<b>Post Treatment System (2 x 200 MLD)</b>								
4.6.1	Lime filters along with auto lime charging system including pipe, valves complete in all respect for auto operation	Lot							

Item No.	Description of Mechanical Items for Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
4.6.2	Lime filters backwash pumping and blower system with pipe, valves complete in all respect for auto operation								
4.6.3	CO2 storage vessels	Lot							
4.6.4	CO2 Dosing System comprising of CO2 filter, Flow regulating valve, Automatic shut off valve, Manual shut off valve, Pressure reducing valve, Safety valves, Discharge valve, Limit switches, automatic change over planes, all mounted on a stainless-steel base frame CO2 Flow meter System, Mass flow sensor (fully calibrated) assembled to process pipe As per designed pipe size and pressure ranges.	Lot							
4.6.5	Caustic storage, dosing system with all tanks, pumps, valves, pipes, EOT and all equipment for auto chemical dosing	Lot							
4.6.6	Hypochlorite storage, dosing system with all tanks, pumps, valves, pipes, EOT and all other equipment for auto chemical dosing	Lot							
4.6.7	Any other works to provide the complete system (Items should be specified)	Lot							
		Lot							
4.7	<b>Product Water Tanks, CWR and Outfall Tank</b>	Lot							
4.7.1	Product Water Tanks, CWR and Outfall– Tank - all mechanical works complete in totality including all valves, gates, piping	Lot							

Item No.	Description of Mechanical Items for Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
	along with any equipment needed as per the Contract.								
4.7.2	Any other works to provide the complete system (Items should be specified)	Lot							
<b>4.8</b>	<b>Waste /Sludge Conveyance and Treatment System</b>								
4.8.1	Waste Sludge Balance–Tank - all mixer, submersible pumps, valves, static mixer etc.	Lot							
4.8.2	Gravity Thickeners - all mechanical system, including valves, pipes, rotating bridge with mixer and sludge scraping system,	Lot							
4.8.3	Thickened Sludge Holding–tank - all mechanical system, including valves, pipes, mixer and BFP feed pumps	Lot							
4.8.4	BFP system - BFP units complete in all respect for auto operation producing 25% consistent solid chips.	Lot							
4.8.5	Chemical dosing system i.e. polymer for thickener and BFP complete in all respect.	Lot							
4.8.6	Any other works to provide the complete system (Items should be specified)	Lot							
<b>4.9</b>	<b>Miscellaneous</b>								

Item No.	Description of Mechanical Items for Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
4.9.1	Mechanical works for Air Compressor, Air Conditioning & Ventilation System including Cooling tower etc. as required in all buildings and covered structures.	Lot							
4.9.2	Fire Detection and Protection System in all building and covered places. Fire Fighting vehicles, pumps, pipes and associated items.	Lot							
4.9.3	Maintenance Bay Equipment (EOT Cranes, Hoist & Monorails etc.) as needed in all buildings and Industrial structures	Lot							
4.9.4	Building Services including domestic water systems. The Bidder shall list here details of any additional items required for a complete installation	Lot							
4.9.5	Workshop equipment and other items	Lot							
4.9.6	Mechanical equipment at sewage treatment	Lot							
4.9.7	Other Miscellaneous Equipment / Items / System not mentioned above but as required in Employers Requirements in contract (Items should be specified)	Lot							
<b>4.10</b>	<b>Bidders shall list here details of any additional items required for a complete system for smooth automatic operation of the 2x200 MLD desalination plant</b>								
4.10.1									

Item No.	Description of Mechanical Items for Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
4.10.2									
4.10.3									
4.11	Building Services for water supply and other mechanical works requirements. The Bidder shall list below details of items required for a complete installation of all mechanical system at all buildings								
4.11.1									
4.11.2									
4.11.3									
	Total Schedule 4								
	Total Schedule 4 (Total Carried to Schedule 8, Grand Summary)								

**Note:**

\* The Price includes all taxes, duties, insurance, transportation etc. and any other charges of equipment delivery at project site.

The base cost should be inclusive of all costs excluding GST/ Custom duty.

**Signature of Bidder**

**Name & Designation**

**Company Name and Seal**

**Schedule 5: Electrical and ICA Works**

To include, but not limited to the following items to deliver the works from supply to commissioning fit for the purpose as per the Contract Specifications.

Item No.	Description of Electrical & ICA Items Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant	Unit	Qty	Local Supply			International Supply		
				Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
5.1	<b>Intake and Outfall (400 MLD)</b>								
5.1.1	All electrical works at Intake and Outfall system	Lot							
5.1.2	All instrumentation and control works as per the contract at intake and outfall system including flow meters, air bursting, shock chlorination system and chlorine dosing to intake pump discharge.	Lot							
5.1.3	Any other works (Items should be specified)	Lot							
5.2	<b>Intake Pumping Station (400 MLD)</b>								
5.2.1	All electrical works at Intake pumping station including pigging system	Lot							
5.2.2	All instrumentation control and automation (ICA) works as per the contract including pH, Temp, Chlorine, Conductivity, Turbidity, flowmeters etc. and all other analysers as per the contract	Lot							
5.2.3	Any other works (Items should be specified)	Lot							
5.3	<b>Pre-treatment Chemical Systems (2x200 MLD)</b>								

Item No.	Description of Electrical & ICA Items Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
5.3.1	All electrical works at pre-treatment chemical system as per the contract including hypochlorite, sulfuric acid, ferric chloride, polymer dosing system etc.	Lot							
5.3.2	All ICA works including flowmeters as per the contract for all pre-treatment chemical dosing system	Lot							
5.3.3	Any other works ( Items should be specified)	Lot							
5.4	<b>Pre-treatment Process Units (2 x 200MLD)</b>								
5.4.1	All electrical works as per the contract at pre-treatment units including flash mixer, flocculation tanks, lamella settlers, DAF and GDMF units	Lot							
5.4.2	All ICA works as per the contract for all pre-treatment process units including filter consoles, level & flow meters, sensors and transmitters complete in all respect for auto operation.	Lot							
5.4.3	Any other works (Items should be specified)	Lot							
5.5	<b>GDMF Backwash and RO Feed Tank (2 x 200 MLD)</b>	Lot							
5.5.1	All electrical works as per the contract at RO feed tank.	Lot							
5.5.2	All ICA works as per the contract for RO feed Tank	Lot							
5.5.3	Any other works (Items should be specified)	Lot							



Item No.	Description of Electrical & ICA Items Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
<b>5.6</b>	<b>RO Skids and CIP System (2 x 200 MLD)</b>								
5.6.1	All electrical works as per the contract at RO system including CIP tank, permeate tank neutralization tank etc.	Lot							
5.6.2	All ICA works as per the contract at RO system, CIP tank, permeate tank, neutralization tank including flowmeters, analysers such as chlorine, turbidity, Boron, conductivity, TSS, SDI, ORP etc. as per the contract.	Lot							
5.6.3	Any other works (Items should be specified)	Lot							
<b>5.7</b>	<b>Post Treatment System (2 x 200 MLD)</b>								
5.7.1	All electrical works as per the contract at CO2 generator, CO2 storage and dosing system and Limestone filters, Caustic dosing storage and system along with auto lime charging system complete in all respect for auto operation	Lot							
5.7.2	All ICA works as per the contract at CO2 system and Limestone filters and Caustic system including flowmeters, analysers such as chlorine, conductivity, hardness, pH etc.	Lot							
5.7.3	Any other works (Items should be specified)	Lot							
<b>5.8</b>	<b>Product Water Tanks, CWR and Outfall Tank</b>								
5.8.1	All electrical works as per the contract at product water tanks, CWR and outfall tanks.	Lot							

Item No.	Description of Electrical & ICA Items Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
5.8.2	All ICA works as per the contract at product water tanks, CWR and outfall tanks.	Lot							
5.8.3	Any other works (Items should be specified)	Lot							
<b>5.9</b>	<b>Waste /Sludge Conveyance and Treatment System</b>								
5.9.1	All electrical works as per the contract at sludge balance tank, thickeners, sludge holding tanks and BFP building including polymer ejector	Lot							
5.9.2	All ICA works including flowmeters and analysers as per the contract at sludge balance tank, thickeners, sludge holding tanks and BFP building including polymer ejector loading system	Lot							
5.9.3	Any other works (Items should be specified)	Lot							
<b>5.10</b>	<b>Substation</b>								
5.10.1	110 kV/11 kV GIS substation in totality including transformers etc.	Lot							
5.10.2	Auxiliary Transformers for LV Services (11kV/433 V)	Lot							
5.10.3	11 KV Switchgear	Lot							
5.10.4	HV and LV Switchgear	Lot							
5.10.5	MV & LV Bus Duct	Lot							
5.10.6	Cabling, Grounding & Lightning Protection	Lot							

Item No.	Description of Electrical & ICA Items Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
5.10.7	Communication System	Lot							
5.10.8	Illumination & Power Supply System	Lot							
5.10.9	Control & Instrumentation including all instruments	Lot							
5.10.10	Any other works ()	Lot							
<b>5.11</b>	<b>Miscellaneous</b>								
5.11.1	Electrical and ICA works at sewage treatment system	Lot							
5.11.2	All electrical and ICA system at the administrative building and all other buildings	Lot							
5.11.3	All plant lighting system including plant earthing and lightning protection system	Lot							
5.11.4	The UPS and Diesel Generators as per contract	Lot							
5.11.5	Other Miscellaneous Equipment / Items / System not mentioned above but as required in Employers Requirement Part-II (Items should be specified)	Lot							
<b>5.12</b>	<b>Bidders shall list here details of any additional items required for a complete electrical and ICA system for smooth and automatic operation of the 400 MLD plant</b>								
5.12.1									
5.12.2									

Item No.	Description of Electrical & ICA Items Procurement, Supply, Installation/Erection, Testing and Commissioning for 2x200 MLD Plant			Local Supply			International Supply		
		Unit	Qty	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	D	E	F	G	H	I	J
5.12.3									
	<i>Total Schedule 5</i>								
	<i>Total Schedule 5 (Total Carried to Schedule 8, Grand Summary)</i>								

**Note:** \* The Price includes all taxes, duties, insurance, and transportation etc. charges of equipment delivery at project site

The base cost should be inclusive of all costs excluding GST/ Custom duty.

**Signature of Bidder**

**Name & Designation**

**Company and Seal**

**Schedule 6: Miscellaneous Works**

To include, but not limited to the following items to deliver the works from supply to commissioning fit for the purpose as per the Contract Specifications.

Item No.	Description of Miscellaneous Items for Procurement, Supply, and Installation/Erection, Testing and Commissioning for 2x200 MLD Plant	Unit	Local Supply			International Supply		
			Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	E	F	G	H	I	J
6.1	Chemical Laboratory Items as per schedule and required. (complete Schedule 12)	Lot						
6.2	Workshop items as per schedule and required. (complete Schedule 13)	Lot						
6.3	Heating, Ventilation and Air conditioning systems in all buildings/ structures as required and specified in the contract	Lot						
6.4	Firefighting s–stem - fire detection and protection system in all building and covered p–aces - including pumps, pipes, valves, and allied items as per requirement and specifications in the contract	Lot						
6.5	Security and Surveillance system at the plant including gate security, plant monitoring and access system as per requirement and specifications in the contract	Lot						
6.6	Any other works required to operate the 400 MLD DSP smoothly meeting the contract requirements such as vehicles for the Employer. FAT, temporary site office etc. (Items should be specified)	Lot						
6.7		Lot						
	<b>Total Schedule 6</b>							

Item No.	Description of Miscellaneous Items for Procurement, Supply, and Installation/Erection, Testing and Commissioning for 2x200 MLD Plant		Local Supply			International Supply		
		Unit	Base Cost (INR)	GST (INR)	Total Price (INR)* (G)=(E)+(F)	Base Cost (USD)	Custom (USD)	Total Price (USD)* (J)=(H)+(I)
A	B	C	E	F	G	H	I	J

*Total Schedule 6 (Total Carried to Schedule 8, Grand Summary)*

**Note:** \* The Price includes all taxes, duties, insurance, and transportation etc. charges of equipment/items delivery at project site.  
The base cost should be inclusive of all costs excluding GST/ Custom duty.

*Signature of Bidder*

*Name & Designation*

*Company Name and Seal*

**Schedule 6: Process Proving of 400 MLD Chennai Seawater Desalination Plant at Perur**

Item	Description	Unit	Base Cost	GST (INR)	Total Price (INR)* F= (D +E)
A	B	C	D	E	F
7	<b>Three months of Process Proving Test Period</b>				
7.1	<b>Power Usage (@ INR 6.35/ kWh</b>	Lot			
7.2	<b>Chemical Usage</b>	Lot			
7.3	<b>Transportation of Sludge</b>	Lot			
7.4	<b>Manpower</b>	Lot			
7.5	<b>Lumpsum Other O &amp; M Price e. g. Asset Replacement etc. Bidder shall provide a list of Asset Replacement items with cost</b>	Lot			
	List of items (Indicate USD where applicable)				
7.6	<b>Total Schedule 7</b>				
	<i>Total Schedule 6 (Total Carried to Schedule 8, Grand Summary)</i>				

\* The Cost includes all taxes, duties, insurance and transportation.

The unit rate should be inclusive of all costs excluding GST/ Custom duty.

**Signature of Bidder**

**Name & Designation**

**Company Name and Seal**

**Schedule 8: Summary of CAPEX Price**

Schedule	Description of Works – Supply, Construction, Installation/ Erection, Testing, Commissioning and Process Proving	Total Price Local Currency (INR)			Total Price Foreign Currency (USD)		
		Base Cost	GST	Total Local Cost*	Base Cost	Custom Duty	Total Foreign Cost*
1	Survey, Design, Drawings and Documentation						
2	Intake and Outfall Piping						
3	Civil Works;						
4	Mechanical Works;						
5	Electrical and ICA Works;						
6	Miscellaneous Works						
7	Process Proving						
8	JV agreement registration charges as per the GoTN registration department.						
<b>GRAND TOTAL OF CAPEX PRICE</b>							

\* The Price includes all taxes, duties, insurance and transportation.

The base cost is inclusive of all costs excluding GST/ Custom duty.

**Signature of Bidder**

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**Schedule 9: Operation and Maintenance of 400 MLD Chennai Seawater Desalination Plant at Perur**

The following O&M expenditure sheet is required to be filled by the Bidders for 20 years of O&M Period (1 to 20 sheets).

Item	Description	Unit	Base Cost (INR)	Taxes & Duties (INR)	Total Price (INR)* (F) = (D) + I
A	B	C	D	E	F
<b>1</b>	<b>First year</b>				
<b>1.1</b>	<b>Variable Cost including chemicals and others.</b>				
	Chemicals cost (complete the Schedule-14)	Lot/ year			
	Any other variable cost (attached details separately)	Lot/ year			
	<b>Sub Total Variable Price</b>				
<b>1.2</b>	<b>Fixed Cost including manpower cost, asset replacement cost, membrane cost and administrative cost</b>				
	Manpower cost (complete the Schedule-15)	Lot/ year			
	Asset Replacement cost (complete the Schedule-16)	Lot/ year			
	Membrane Replacement cost (complete the Schedule 17)	Lot/ year			
	Administrative cost (attach details separately)	Lot/ year			
	Routine Maintenance (attach details separately)	Lot/ year			
	Any other fixed cost (such as Fuel, Vehicle maintenance, sludge disposal etc. attach details separately)	Lot/ year			
	<b>Sub Total Fixed Price</b>				
<b>1.3</b>	<b>Total O&amp;M Price (1.1 + 1.-) - First year</b>				

\* The Cost includes all taxes, duties, insurance and transportation.

The base cost is inclusive of all costs excluding GST/ Custom duty.

Note:- Sub-total of Fixed Price should not be more than 30% of the Total O&M Price for each year. For Sludge disposal, the Bidder shall provide the rate for disposal within 20 km and beyond.

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Note: Similar Sheets are to be filled for the rest of the year from 2<sup>nd</sup> year to 20<sup>th</sup> year.

**Schedule 10: Summary of O&M Price**

<b>Year</b>	<b>Description</b>	<b>Base Cost (INR)</b>	<b>Taxes &amp; Duties (INR)</b>	<b>Total Price (INR)* (F) = (C) + (D)</b>
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
1.	1 <sup>st</sup> Year O&M Price			
2.	2 <sup>nd</sup> Year O&M Price			
3.	3 <sup>rd</sup> Year O&M Price			
4.	4 <sup>th</sup> Year O&M Price			
5.	5 <sup>th</sup> Year O&M Price			
6.	6 <sup>th</sup> Year O&M Price			
7.	7 <sup>th</sup> Year O&M Price			
8.	8 <sup>th</sup> Year O&M Price			
9.	9 <sup>th</sup> Year O&M Price			
10.	10 <sup>th</sup> Year O&M Price			
11.	11 <sup>th</sup> Year O&M Price			
12.	12 <sup>th</sup> Year O&M Price			
13.	13 <sup>th</sup> Year O&M Price			
14.	14 <sup>th</sup> Year O&M Price			
15.	15 <sup>th</sup> Year O&M Price			
16.	16 <sup>th</sup> Year O&M Price			
17.	17 <sup>th</sup> Year O&M Price			
18.	18 <sup>th</sup> Year O&M Price			
19.	19 <sup>th</sup> Year O&M Price			
20.	20 <sup>th</sup> Year O&M Price			
<b>GRAND TOTAL OF O&amp;M PRICE</b>				

\* The Price includes all taxes, duties, insurance and transportation.

The base cost is inclusive of all costs excluding GST/ Custom duty.

**Signature of Bidder**

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**Company and Seal**

**Schedule 11: Grand Summary of Price Schedule (CAPEX & OPEX Price)**

Schedule	Description of Works – Supply, Construction, Installation/ Erection, Testing, Commissioning and Process Proving and O&M for 20 years	Total Price Local Currency (INR)			Total Price Foreign Currency (USD)		
		Base Cost	GST	Total Local Cost*	Base Cost	Custom Duty	Total Foreign Cost*
		A	B	C=(A+B)	D	E	F=(D+E)
1	Survey, Design, Drawings and Documentation						
2	Intake and Outfall Piping						
3	Civil Works;						
4	Mechanical Works;						
5	Electrical and ICA Works;						
6	Miscellaneous Works						
7	Process Proving						
8	JV agreement registration charges as per the GoTN registration department.						
10	Operation and Maintenance						
<b>GRAND TOTAL OF PRICE SCHEDULE</b>							

\* The Price includes all taxes, duties, insurance and transportation.

The base cost is inclusive of all costs excluding GST/ Custom duty.

**Signature of Bidder**

**Name & Designation**

**Company Name and Seal**

**Schedule 12: Chemical Laboratory Items**

Item No.	Description of Items to be Procured for Chemical Laboratory			Unit Price (INR/USD)	Local Supply		International Supply	
		Unit	Qty		GST (INR)	Total Price* (INR)	Custom Duties (USD)	Total CIF Price* (USD)
A	B	C	D	E	F	G=D x (E+F)	H	I=Dx (E+H)
1	Electronic Balance	No.	4					
2	Bunsen Electric Heater	No.	4					
3	Magnetic Stirrer - 1MLH	No.	4					
4	Water bath with 6 to 8 concentric holes and discs, electrically heated	No.	2					
5	Muffle Furnace	No.	2					
6	Color Comparator	No.	2					
7	Centrifuge system	Set	2					
8	Turbidity meter	No.	4					
9	Autoclave	No.	2					
10	Coagulation-Flocculation Simulator	No.	2					
11	COD Assembly	No.	2					
12	Distilled water plant	No.	2					
13	ORBECO Analytical System	No.	2					
14	ORBECO HELLIGE -975MP	No.	2					
15	Electric Oven	No.	2					
16	BOD Incubator	No.	2					
17	TDS meter	No.	4					
18	Spectrophotometer- UV-UIS Spectrophotometer Latest Unit	No.	2					

Item No.	Description of Items to be Procured for Chemical Laboratory			Unit Price (INR/USD)	Local Supply		International Supply	
		Unit	Qty		GST (INR)	Total Price* (INR)	Custom Duties (USD)	Total CIF Price* (USD)
A	B	C	D	E	F	G=D x (E+F)	H	I=Dx (E+H)
19	Potable kit for pH/ORP/ Cond/TDS/Temp/DO meters		4					
20	Weight Balance	No.	4					
21	pH meter- pH Scan2	No.	4					
22	Refrigerator and Freezer, 360 lts capacity of approved make	No.	2					
23	Burette, Pipette, Flask	Set	50					
24	Measuring Cylinders (1000 ml, 500 ml, 200 ml, 100 ml, 50 ml, 25 ml)	Set	6					
25	Chlorine analyzer (comparator)	No.	4					
26	Conductivity meter	No.	4					
27	Mercury Ioniser	No.	2					
28	Dissolved Oxygen Meter	No.	4					
29	Colony counter	No.	2					
30	Membrane Filtration Assembly	No.	2					
31	Binocular Microscope	No.	2					
32	Jar test apparatus	No.	2					
33	Sampling Bottles (Reagent Bottles of 250 ml Capacity)	No.	100					
34	Wire Baskets	No.	10					
35	Suction Flask (1litre capacity)	No.	4					
36	TOC analyser – High Temp Combustion type							

Item No.	Description of Items to be Procured for Chemical Laboratory			Unit Price (INR/USD)	Local Supply		International Supply	
		Unit	Qty		GST (INR)	Total Price* (INR)	Custom Duties (USD)	Total CIF Price* (USD)
A	B	C	D	E	F	G=D x (E+F)	H	I=Dx (E+H)
37	All types of laboratory glassware, accessories and other consumables and reagents for minimum two years requirement.	No.	Lot					
	<b>Total Schedule 12 to be carried to Schedule 6 - Miscellaneous</b>							

**Note:** \* The Price includes all taxes, duties, insurance, and transportation etc. charges of equipment/items delivery at project site.  
The base cost is inclusive of all costs excluding GST/ Custom duty.

**Signature of Bidder**

**Name & Designation**

**Company Name and Seal**

**Schedule 13: Workshop Items**

Item No.	Description of Items to be Procured for Workshop	Qty	Unit Price (INR/USD)	Local Supply		International Supply	
				GST (INR)	Total Price* (INR)	Custom Duties (USD)	Total CIF Price* (USD)
A	B	C	D	E	F=C x (D+E)	G	H=C x (D+G)
1.	Heavy duty high speed lathes, 250 mm centre height, 1500 mm between centres including all features as per the specifications	1					
2.	Heavy duty high speed lathes, 200 mm centre height, 1500 mm between centres including all features as per the specifications	1					
3.	Heavy duty high speed vertical lathes, 2000 mm table diameter, working piece diameter 2300 mm , working piece height 1400 mm, working piece weight 20000 kg, with accessories	1					
4.	Horizontal boring, drilling and milling machine, work spindle dia.100 mm, self-acting traverse of spindle at one setting 700 mm, with all features as per the specifications	1					
5.	Surface grinding machine wet grinding, grinding wheel diameter/ width 250/25 mm, distance table to centre of spindle approx. 500 mm, table clamping area 900 x 250 mm, steeples adjustable including electrical equipment with motor and standard accessories	3					
6.	Column grinder, with 2 wheels 300 x 40 x 76 mm for wet grinding, left hand side with normal rest, right hand side with adjustable workpiece support table and angle stop, with all features as per the specifications	2					
7.	Universal milling machine, table size 1300 x 400 mm, steeples feed drive in all three table	2					

Item No.	Description of Items to be Procured for Workshop	Qty	Unit Price (INR/USD)	Local Supply		International Supply	
				GST (INR)	Total Price* (INR)	Custom Duties (USD)	Total CIF Price* (USD)
A	B	C	D	E	F=C x (D+E)	G	H=C x (D+G)
	directions, longitudinal travel of table 1000 mm, cross travel of table 340 mm with all features as per the specifications						
8.	Vertical milling machine, table size 1900 x 400 mm, steeples feed drive in all three table directions, integrated automatic lubricating system, cooling system, main spindle drive, motor protection switch, controls integrated on panel, accessories.	1					
9.	<b>Heavy duty high speed shaping machine</b> , 725 mm ram stroke, 725 x 340 mm table size, shaping width 600 mm, complete with electric motor equipment, automatic vertical feed of the tool holder, main switch, motor protection switch, rotary concentric machine vice, with standard accessories.	1					
10.	Screw threading machine, with solid steel frame, including pole- changing 3-phase motor for pipe and whitworth thread from 1/4 to 2", metric threads M6 to M52, with motor protection switch and standard accessories.	1					
11.	Heavy duty power hacksaw, fully hydraulic 4 stroke, cutting range in round material 225 mm, for metering from 450 mm, complete with electric motor equipment , stock support 500 mm high with heavy material Toller, accessories.	2					
12.	Heavy duty circular column drilling machine, drilling capacity in steel up to 35 mm, in cast iron up to 45 mm, 350 mm column-spindle distance, column diameter approx. 160 mm, stepless, with at least.3 kW electric motor, motor protection switch, coolant supply pump, accessories.	1					



Item No.	Description of Items to be Procured for Workshop	Qty	Unit Price (INR/USD)	Local Supply		International Supply	
				GST (INR)	Total Price* (INR)	Custom Duties (USD)	Total CIF Price* (USD)
A	B	C	D	E	F=C x (D+E)	G	H=C x (D+G)
13.	Bench drilling machine, drilling capacity in steel up to 10 mm, radius 200 mm, with high-capacity high-speed chuck to 10 mm, adjustable rectangular table, drilling depth 60 mm, column diameter 70 mm, base plate 170 x 170 mm, complete with electrical equipment and motor, motor protection switch and standard accessories.	2					
14.	Electric pipe bender, complete with all necessary tooling required for cold bending heavy gauge steel pipe of up to 100 mm inside diameter to the smallest radic possible, limited only by the pipe bore and wall thickness, without flattening.	2					
15.	Universal folding press, for hand operation, including base frame, for 3 mm plate thickness, 2000 mm working width, 45° angle bar, 3 mm rad. round bar, steel rail for the bending beams, accessory holders with standard accessories.	2					
16.	Combined plasma welding and metal cutting set, cutting range from 2 to 25 mm in steel, provisions for connecting to argon, nitrogen or hydrogen gas bottles complete with welding and manual cutting torches, pressure regulators and one year's supply of welding rods and gas bottles.	2					
17.	Mobile work benches 1500 x 700 mm surface area, suitable for containing one set of mobile work bench tools each.	2					
18.	Steel tool cupboards 500 x 500 x 1000 mm high, including 125 mm leg height, with upper steel drawer and two removable trays, door latch for padlock, including lock.	4					
19.	Steel tool cupboards with double doors, 1000 x 500 x 1000 mm high including 125 mm leg height, with centre partition, each side separately lockable with two steel drawers and two	6					

Item No.	Description of Items to be Procured for Workshop	Qty	Unit Price (INR/USD)	Local Supply		International Supply	
				GST (INR)	Total Price* (INR)	Custom Duties (USD)	Total CIF Price* (USD)
A	B	C	D	E	F=C x (D+E)	G	H=C x (D+G)
	removable trays, door latches for padlocks, including padlocks.						
20.	Work benches with 1500 x 700 x 50 mm plywood top, backboard, angle iron supporting frame, one steel plate drawer, with safety lock and two keys, one shelf underneath of extra strong construction, with six (6) all-steel parallel vices, 150 mm jaw width with bolts for through attachment to the benches.	10					
21.	Vertical drilling machine	2					
22.	Hacksaw machine	2					
23.	Bench Grinder	2					
24.	Miscellaneous items and hand tools with safety equipment	Lot					
25.	Toolboxes	10					
26.	Portable Noise level tester	4					
27.	Portable vibration tester	4					
28.	Magnetic base dial gauge	4					
29.	Portable temperature meter	4					
30.	Filler gauge	4					
31.	Precision spirit level	4					
32.	415V, 3 phase, 50hz, 40kVA portable DG set (trolley mounted) including all necessary metering & protection unit, battery, manual control panel, plug & socket, etc., with cable and accessories. Acoustic enclosure which complies	2					

Item No.	Description of Items to be Procured for Workshop	Qty	Unit Price (INR/USD)	Local Supply		International Supply	
				GST (INR)	Total Price* (INR)	Custom Duties (USD)	Total CIF Price* (USD)
A	B	C	D	E	F=C x (D+E)	G	H=C x (D+G)
	with all environmental regulations shall be included as a part of the supply.						
33.	Toolbox with all necessary tools fixed spanner, ring spanners, screwdrivers, adjustable jaw spanners, etc.	5					
34.	Hand trolley (500kg capacity)	4					
35.	Tripod with chain pulley blocks of 1 Ton capacity (6.0m legs)	4					
36.	Welding set, 400 amp, three-phase regulator type, air-cooled, wheel mounted with 15 m welding cable, 2 m. welding cable for earthing, one welding holder, one welding screen with glass and 3 cable lugs, one pair hand gloves and one wire brush	2					
37.	Portable hand drill (heavy duty) of capacity 13 mm to 23 mm with ½” drill chuck but with drill bits and drill stand	4					
38.	Tong tester, 1000 Amp	4					
39.	Hand crimping tool with dies suitable for cable joining up to 95 sq. mm.	2					
40.	Hydraulic crimping tool, suitable for cable joining from 25 to 400 sq. mm.	4					
41.	Hydraulic jack, 5 Ton capacity	4					
42.	De-watering pump sets of 5 kW with 50 meters hose pipe	4					
43.	Motorized and handle operated insulation resistor tester, 5 kV (multi-range setting), with battery pack	4					
44.	Handle-operated insulation resistor tester - 1000 Volts	4					
45.	Megger, 1000 volt	2					

Item No.	Description of Items to be Procured for Workshop	Qty	Unit Price (INR/USD)	Local Supply		International Supply	
				GST (INR)	Total Price* (INR)	Custom Duties (USD)	Total CIF Price* (USD)
A	B	C	D	E	F=C x (D+E)	G	H=C x (D+G)
46.	Megger, 5000 volts (motorized)	2					
47.	Insulating oil tester and filter	2					
48.	Hand grinder (Angle 7")	2					
49.	Clamp-on Digital Meter (0 - 1000 Amperes)	2					
50.	Multi-meter (Digital)	2					
51.	Micro-Ohm meter	2					
52.	Portable vacuum cleaner/blower (industrial type)	4					
53.	Aluminium folding ladder - 8 meters	4					
54.	4 terminal Earth Tester (digital)	4					
55.	Rubber gloves (110 kV rating)	12					
	<b>Total Schedule 13 to be carried to Schedule 6 - Miscellaneous</b>						

**Note:** \* The Price includes all taxes, duties, insurance, and transportation etc. charges of equipment/items delivery at project site.  
The base cost is inclusive of all costs excluding GST/ Custom duty.

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**Schedule 14: Chemical Consumption Cost during O&M Period**

Item	Description of Chemical Consumption (Yearly) during O&M Period	Unit (as supplied)	Guaranteed Quantity	Unit Rate (INR)	GST INR)	Total Price (INR)* / Annum $G = (D \times E) + F$
A	B	C	D	E	F	G
(a)	Hypochlorite for Shock Chlorination	Tons / year				
(b)	Hypochlorite for Pre Chlorination	Tons / year				
(c)	Sulfuric acid for Pre-Chlorination	Tons / year				
(d)	FeCl <sub>3</sub> solution dosing (40%)	Tons / year				
(e)	Anionic Polymer dosing for flocculation (Food grade)	Tons / year				
(f)	Cationic Polymer for Thickener	Tons / year				
(g)	Cationic Polymer for BFP (Non Food grade)	Tons / year				
(h)	Antiscalant	Tons / year				
(i)	Sodium Bisulphite	Tons / year				
(j)	Any other chemical for biofouling control	Tons / year				
(k)	CO <sub>2</sub> for remineralization	Tons / year				
(l)	CaCO <sub>3</sub> for remineralization	Tons / year				
(m)	Hypochlorite for Post Chlorination	Tons / year				
(n)	NaOH for pH adjustment pre/post RO system	Tons / year				
(o)	Citric Acid for CIP	Tons / year				
(p)	HCl for CIP & Neutralization	Tons / year				
(q)	NaOH for CIP & Neutralization	Tons / year				
(t)	Any other Chemicals	Tons / year				
	<b>Total Sum of Schedule 14 (to be carried to Schedule 9)</b>					

**Note:** \* The Price includes all taxes, duties, insurance, and transportation etc. charges of equipment/items delivery at project site.  
The base cost is inclusive of all costs excluding GST/ Custom duty. Chemical quantity shall match with the Functional Guarantee.

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**Schedule 15: Manpower Cost during O&M Period**

Item	Designation of Manpower during O&M Period	No. of Staff <sup>#</sup>	Basic Salary/ year (INR)	Other Benefits/year (INR)	Income Tax / year (INR)	Gross Salary (INR)*/Annum
A	B	C	D	E	F	G = D + E
1.	Plant Manager					
2.	Sr. Operation Manager					
3.	Operation Manager/ Shift-in-charge					
4.	Maintenance Incharge					
5.	Maintenance Personnel					
6.	SCADA Operator					
7.	Field Operator					
8.	Admin Staff					
9.	Chemist					
10.	Lab Assistant					
11.	Helpers					
12.	Safety Officer					
13.	Security Guards					
14.	Drivers					
15.	Gardener/Cafeteria cleaning					
16.	Any other staff					
17.						
18.	<b>Total Sum of Schedule 15 (to be carried to Schedule 9)</b>					

**Note:** \* The Price includes all taxes, benefits etc. to the staff.

# please refer minimum requirements for staffs and qualifications at Part-2 Clause 13.4.2 Operation and Maintenance -

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**Schedule 16: List of Asset Replacement and Spare Parts Over 20 years**

Item No.	ITEMS (Asset Replacement and Spare Parts Over 20 years)	Guaranteed Qty	Unit Price (INR/USD)	Local Supply		International Supply	
				GST (INR)	Total Price* (INR)	Custom Duties (USD)	Total CIF Price* (USD)
A	B	C	D	E	$F=(C \times D)+E$	G	$H=(C \times D)+G$
1.							
2.							
3.							
4.							
5.							
6.							
<b>Total Sum of Schedule 16</b>							

\* The Price includes all taxes, duties, insurance, and transportation etc. charges of equipment/items delivery at project site.

Note: Total cost in this Schedule 16 shall be equal to the additional of Asset Replacement Costs of Schedule-9 over 20 years. Bidders may provide separate sheet for every year during O&M period of 20 years.

***Signature of Bidder***

***Name & Designation***

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**Schedule 17: List of Membrane Replacement Over 20 years**

Item No.	ITEMS (Membrane Replacement Over 20 years)	Guaranteed Qty	Unit Price (INR/USD)	Local Supply		International Supply	
				GST (INR)	Total Price* (INR)	Custom Duties (USD)	Total CIF Price* (USD)
A	B	C	D	E	$F=(C \times D)+E$	G	$H=(C \times D)+G$
1.	RO membrane (type -1)						
2.	RO membrane (type -2)						
3.	Micron Cartridge Filters						
	<b>Total Sum of Schedule 17</b>						

\* The Price includes all taxes, duties, insurance, and transportation etc. charges of equipment/items delivery at project site.

Note: Total cost in this Schedule 17 shall be equal to the additional of Membrane Replacement Costs of Schedule-9 over 20 years. Bidders may provide separate sheet for every year during O&M period of 20 years.

**Signature of Bidder**

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**Schedule 18: Payment Terms**

Payment Schedule shall be regulated as under:

<b>Design and Engineering</b>		
<b>Sl. No.</b>	<b>Description</b>	<b>%age Payment</b>
1	Against submission of Drawing / document	30%
2	Against approved with comment category	20%
3	Against final approval	40%
4	Against completion of “As Built” drawings.	10%

<b>Intake Outfall Offshore Works</b>		
<b>Sl. No.</b>	<b>Description</b>	<b>%age Payment</b>
1	Supply of intake and outfall HDPE pipe, Heads and Diffusers at site	20%
2	Complete installation of pipeline, Heads and Diffusers. Payment based on progress achieved in laying of the pipeline on a pro-rata basis	60%
3	Completion of satisfactory Testing & Commissioning	15%
4	On successful Performance Test and issue of Commissioning Certificate.	5%

**Civil Works**

<b>Sl. No.</b>	<b>Description</b>	<b>%age Payment</b>
1	Supply of civil items and Completion of Sub-structure/piling/raft up to plinth level on pro-rata basis.	20%
2	Completion of super structure on pro-rata basis.	40%
3	Completion of allied items such as handrail, painting, epoxy coat etc. on pro-rata basis.	10%
4	Completion of satisfactory Testing & Commissioning	20%
5	On successful Performance Test and issue of Commissioning Certificate.	10%

This payment mode of payment of Civil Works will be applicable only for concrete works such as Tanks & Buildings but not for Road Works, Boundary Walls Works, Landscape works.

**Electro-Mechanical & ICA Equipment**

<b>Sl. No.</b>	<b>Description</b>	<b>%age Payment</b>
1	Receipt of material on site	60%
2	Completion of Erection on pro-rata basis.	10%
3	Completion of satisfactory Testing & Commissioning	20%
4	On successful Process Proving Test and issue of Commissioning Certificate.	10%