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 of Proposal: xx/xx/xx

TABLE OF CONTENTS

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), which includes 5 Packages i.e. 400 MLD Desalination Plant, Pumping Stations and Reservoirs, Product Water Transmission Mains, Improvement of the Existing Water Distribution Networks and Installation of External Power Transmission Line. 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, 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 design, execution and completion 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 10:30 hrs to 17:45 hrs 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, 3rd Floor, No.75, Santhome High Road,
   Raja Annamalaipuram, Chennai 600 028
   Telephone: 044 28451300 Extn: 209, Facsimile: 044 28458181
   E-mail: secandm@cmwssb.in
   Website: www.chennaimetrowater.tn.nic.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, 3rd Floor, No.75, Santhome High Road,
Raja Annamalaipuram, Chennai 600 028
Telephone: 044 28451300 Extn: 209, Facsimile: 044 28458181
E-mail: secandm@cmwssb.in
Website: www.chennaimetrowater.tn.nic.in

Yours Sincerely,

CMWSS Board.

PART 1 BIDDING PROCEDURES

TABLE OF CONTENTS

Section I.Instructions to Bidders

The Instructions to Bidders governing this bidding process are the "Instructions to Bidders included in **Option A**, Single-Stage Two-Envelope Bidding, Section I," of the Standard Bidding Documents for Procurement of Electrical and Mechanical Plant, and for Building and Engineering Works, Designed by the Contractor (SBD (Design Build)) (Trail Version) published by JICA in July 2015. Those Instructions to Bidders are available on the JICA's web site shown below:

http://www.jica.go.jp/english/our_work/types_of_assistance/oda_loans/oda_op_info/guide/tender/index.html

A copy of the Instructions to Bidders is not attached to these Bidding Documents.

Section II.Bid Data Sheet

A. General	
ITB 1.1	The number of the Invitation for Bids is : CMWSSB/CNT/WSS/ICB/JICA/DESAL/CP01/018/2020-21
ITB 1.1	The Employer/Client is: Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB)
ITB 1.1	The name, identification and number of the lot(s) (contract(s)) comprising this ICB is: 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). Tender No.: CMWSSB/CNT/WSS/ICB/JICA/DESAL/CP01/018/2020-21 Number of the lot(s): 1 No.
ITB 2.1	The Borrower is Government of India (GoI) for Government of Tamil Nadu (GoTN) for Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB)
ITB 2.1	The number of the Loan Agreement is: ID-P267 The amount of a Japanese ODA Loan is INR 42,677 Million The signed date of the Loan Agreement is: 29/03/2018
ITB 2.1	The name of the Project is: Project for Construction of Chennai Seawater Desalination Plant (I)
ITB 2.2	The applicable Guidelines for Procurement under Japanese ODA Loans are those published in: *April 2012*
ITB 3.1(c)	A list of debarred firms and individuals is available at the World Bank's website: www.worldbank.org/debarr
ITB 4.5	This bidding is subject to prequalification.

B. Bidding Documents	
ITB 7.1	For **clarification purposes** 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, 3rd Floor, No.75, Santhome High Road, Raja Annamalaipuram, Chennai 600 028 Telephone: 044 28451300 Extn: 209, Facsimile: 044 28458181 E-mail: secandm@cmwssb.in
ITB 7.1	Responses to any request for clarification, if any, will be provided through written communication.
ITB 7.1	The bidder may raise the queries four weeks prior to the date of submission of bid.
ITB 7.4	A pre-bid meeting will take place at the following date, time and place: Date: xx/xx/xxxx (3 weeks after issue of RfP). Time: xx:00 AM Place: Office of Superintending Engineer (C&M), CMWSSB, Urban Administrative Building, 3rd Floor, No.75 Santhome High Road, Raja Annamalaipuram, Chennai 600 028 A site visit can be arranged one week after issue of RfP..
ITB 8.2	Addenda, if any, will be issued to the shortlisted bidders.
C. Preparation of Bids	
ITB 10.1	The language of the Bid is: English.
ITB 11.2 (l)	The Bidder shall submit with its Technical Bid the following additional documents: None
ITB 11.3 (d)	The Bidder shall submit with its Price Bid the following additional documents: None
ITB 13.1	Only one Alternative Bid is permitted in accordance with: ITB13.4 The Bidders 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.
ITB 13.4	Alternative technical solutions are permitted for the following parts of the Works: Pre-treatment and RO Systems as further detailed in Section VI, Employer's Requirements. The evaluation method is as specified in Section III, Evaluation and Qualification Criteria.
ITB 16.1 (b)	The list of spare parts, special tools etc. shall be furnished by the Contractor one year before the end of O&M period.
ITB 18.1	Bidders shall quote for the entire Works on a single responsibility basis.
ITB 18.5	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
ITB18.7	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 taxes, 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 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.
ITB 19.1	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.
ITB 20.1	The Bid validity period shall be 180 days.

ITB 20.3 (a)	The Bid Price shall be adjusted by the following factor: NIL
ITB 20.3 (b)	The fixed portion of the Bid Price shall be adjusted by the factor: NIL
ITB 21.1	Bid must be accompanied by Bid Security as specified below: 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 (Rupees Fourteen Crores only)
ITB 21.2 (a)	The Bid Security only in the form of BG shall be submitted from the Scheduled Banks listed under Reserve Bank of India.
ITB 21.2 (b), (c) and (d)	Not Applicable
ITB 21.7	In case the JV is not legally incorporated, the Bid Security can be submitted by Lead Member or any Member on behalf of the JV. Employer will get the 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.
ITB 22.1	In addition to the original of the Bid, the number of copies is: **Two Copies,** clearly marking the Original and Copies; **and one soft copy in the form of CD/DVD/Pen Drive**.
ITB 22.2	The written confirmation of authorization to sign on behalf of the Bidder shall consist of: Original Power of Attorney (legally valid).
D. Submission and Opening of Bids	
ITB 24.1	For **Bid submission purposes** 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, 3rd Floor, No.75 Santhome High Road, Raja Annamalaipuram, Chennai 600 028 E-mail: secandm@cmwssb.in **The deadline for Bid submission is:** Date: xx/xx/2021 Time: xx:00 PM

ITB 27.1	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, 3rd Floor, No.75 Santhome High Road, Raja Annamalaipuram, Chennai 600 028 E-mail: secandm@cmwssb.in Date: xx/xx/2021 Time: xx:00 PM
E. Evaluation, and Comparison of Bids	
ITB 34	Not Applicable
ITB 37.1	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) The source of exchange rate shall be: Reserve Bank of India. The date for exchange rate shall be the date 28 days prior to the date of technical bid opening specified in ITB 27.1.
ITB 38.2 (a)	Not Applicable
ITB 38.2 (d)	Not Applicable
ITB 43	The following clause is added as ITB 43.3: a) The successful bidder, in case of a JV shall have the option of executing the Work by registering a JV in Chennai or by incorporating a Special Purpose Vehicle (SPV). i) In case, the successful bidder opts to execute the Work through a registered JV, then the Contractor should submit an attested and authorised power of attorney of the JV representative in whom the payments are to be made and the details of the Lead Member of the JV. Payments will be made to the Lead Member of the JV or to the members individually as per the directions of the Lead Member. b) In case the successful bidder in case of the JV opts to form an SPV for the execution of the Work, the successful bidder shall establish a legal entity in the form of a company incorporated in India under the Companies Act, 2013 as early as possible from the date of issue of Letter of Award. Delay in the formation of SPV will not be a ground for the Contractor to claim any extension of time over and above the actual contract period. In this case, the invoices will be raised by the SPV and the payments will be made to the SPV only. Any bank guarantees towards mobilisation advance, material purchase advances etc. will be furnished in the name of the SPV. SPV is only for the ease of execution of the work and the

	primary responsibility of the contract lies with the successful bidder.In case of a successful bidder (single bidder) being a foreign company, the successful bidder shall establish a legal entity in the form of a company incorporated in India under the Companies Act, 2013 as early as possible from the date of issue of Letter of Award. Delay in the formation of SPV will not be a ground for the Contractor to claim any extension of time over and above the actual contract period. In this case, the invoices will be raised by the SPV and the payments will be made to the SPV only. Any bank guarantees towards mobilisation advance, material purchase advances etc. will be furnished in the name of the SPV. SPV is only for the ease of execution of the work and the primary responsibility of the contract lies with the successful bidder. Also, the foreign company shall provide a corporate guarantee from its parent company. The aforesaid options shall be mentioned during the bidding stage only and shall not be allowed to change after the award of the contract.

Section III.Evaluation and Qualification Criteria

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

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.

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

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).

(b) Specific additional criteria

The following additional criteria will be used in the evaluation:

- **The Electricity Cost:**

  i. The estimated total cost of the electricity required at and consumed by the Plant and equipment during the 20 years of Operation & Maintenance including one year of DLP:

     a) The power consumed by the equipment supplied as a part of the facilities, based on calculations of the operating efficiencies and power consumption of all electrically operated Plant and equipment under working condition.

  ii. The Evaluation shall further be considered as:

     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.

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 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(i) 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(ii)	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(ii)	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	**History of non-performing Contracts**	Non-performance of a contract(i) did not occur as a result of contractor's default since 1st January 2015.	Must meet requirement (ii)	N/A	Must meet requirement (ii)	N/A	Form CON
2.2.2	**Pending Litigation**	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 (ii)	N/A	Must meet requirement (ii)	N/A	Form CON
2.2.3	**Litigation History**	No consistent history of court orders(iii) against the Applicant since 1st January 2015.	Must meet requirement (ii)	N/A	Must meet requirement (ii)	N/A	Form CON

Notes for the Applicants

(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**	
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. (ii)This requirement also applies to contracts executed by the Applicant as a JV member. (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.							

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
2.3.2	**Average Annual Turnover**	Minimum average annual turnover of USD 325 million, calculated as total certified	Must meet requirement	Must meet requirement	Must meet not less than 25%	Lead member in JV must	Form FIN –2

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**	
		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			of the requirement	meet not less than 50% of the requirement	
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 the subject contract(s) net of the Applicant's all other	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**	
		commitments, both current and future.					
		B) The Applicant should have a minimum available bid capacity of USD 650 million consisting of executing capacity and existing commitments. Available Bid Capacity = AxNxM-B, where A=Max value of works executed during one financial year in the last five years. N= Number of years prescribed for completion of the works for which bids are invited=Three and half years/Forty two months M=2.5 B=value of the existing commitments in all ongoing Engineering works (excluding O&M cost) to be	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**	
		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

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

TABLE OF FORMS

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 ITB 5;

(c) We, including any Subcontractors/ manufacturers, for any part of the Contract, have no conflict of interest in accordance with ITB 4;

(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, E, F and G of column (e). 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)	(f)
Index code	**Index description**	**Source of index**	**Bidder's Related Currency amount**	**% Range of Weighting**	**Bidder's Proposed weighting**
	A. Nonadjustable			0.15	A: 0.15
	B. Labour	Consumer Price Index for Industrial Workers published by Ministry of Labour, Govt. of India.		0.10-0.15	B:
	C. Cement	Wholesale Price Index published by Ministry of Commerce & Industry, Govt. of India for following:		0.05-0.10	C:
	D. Steel			0.05-0.10	D:
	E. Fuel & Lubricants	a) Cement- Grey Cement		0.30 - 0.35	E:
	F. Plant & Machinery	b) Steel- Rebars c) Plant & Machinery-electrical machinery equipment and batteries		0.20 – 0.25	F:
	G. CI Pipes & Specials & DI Pipes & Specials	d) CI Pipes & Specials & DI Pipes & Specials- Pigiron			G:
	H. Local materials	e) Local materials- Index for all commodities.			
		Fuel & lubricants- Rates charged by Indian Oil Corporation at Chennai.			
Total					**1.00**

The Bidder shall fill in column (e) and specify a value within the ranges given by the Employer in B, C, D, E, F & G of column (f), 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

SCHEDULE OF PAYMENT

[*If the Contract includes a Schedule of Payment specifying the installments 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*]

TECHNICAL PROPOSAL[1]

[*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*]

[1] 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 Part2 before filling the Schedules.

1.0 Intake Works

S. No.		Items – for 400 MLD Plant	Unit	Description for 2x200 MLD items
(a)		**Sea Water Intake System**		
	i)	Design Capacity of total offshore intake	MLD	
	ii)	Sea Water Offshore intake pipe details • MOC • No. of Pipes and Screen Head *(2 pipes and heads required)* • Length of Intake pipe from seashore • Pipe thickness (pressure rating)		
	iii)	Offshore Velocity Cap Type Head • Head Diameter • Height above seabed • Height below seabed • MOC		
	iv)	Offshore Screen • No. of screens • Size (Opening) • Height • MOC (*Super Duplex Steel required*) • Velocity Cap type Head Diameter • Velocity of Water at screen • Max head loss across bar screen		
	v)	Seawater Intake Well	(m x m x m)	

S. No.		Items – for 400 MLD Plant	Unit	Description for 2x200 MLD items
		• Dimension of the Well • MOC of Well • Chambers in the Well *(min 2 Chambers required)* • Type of gates used *(Sluice gates required – stop logs not acceptable)* • MOC of gates • Bottom level in Chart Datum • Seawater level in the Well (min/average/max)		
	vi)	Pigging System • Dimension of the Pig • MOC of Pig • No. of Pigs • Pumps Details (flow, press) for the Pigging System • MOC of pumps		
(b)		**Sea Water Outfall System**		
	i)	Design Capacity of total offshore Outfall	MLD	
	ii)	Sea Water Offshore Outfall pipe details • MOC • No. of Pipes • Length of Outfall pipe from seashore • Pipe thickness (pressure rating)		
	iii)	Offshore Diffuser • No. of Diffusers • Size (Opening) • MOC • Distance between diffusers		

S. No.		Items – for 400 MLD Plant	Unit	Description for 2x200 MLD items
		• Max Velocity		
	iv)	Outfall Tank • Dimension of the tank • MOC of tank • Chambers in the tank • Type of gates used • *MOC of gates*		
(c)		**Travelling Band Screens (Onshore)**		
	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)		**Sea Water Intake Pumps**		
	i)	Type of pump		
	ii)	Total Quantity (working + standby)	Nos.	
	iii)	Capacity of each Pump	m3/hr	
	iv)	Materials of Construction • Casing • Shaft • Impeller	-	
	v)	Performance criteria • Efficiency of Pump • Motor KW & rpm • Noise level		

S. No.		Items – for 400 MLD Plant	Unit	Description for 2x200 MLD items
		• Vibration level		

2.0 Pretreatment

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 for200 MLD items
a)		**Hypo Storage and Dosing System**		
	i)	Chemical dosage (range)	mg/ll	
	ii)	Number of dosing Tanks	No.	
	iii)	Capacity of dosing tanks	m^3	
	iv)	Material of dosing tank		
	v)	Number of dosing pumps (Working + Standby)	Nos.	
	vi)	Type of dosing pumps		
	vii)	Material of dosing pumps • Casing • Shaft • Impeller		
	viii)	Capacity of dosing pump	LPH@ MWC	
	ix)	Days of chemical storage *(min 30 days)*	days	
	x)	Size of the storage tank	m3	
	xi)	Material of storage tank		
	xii)	Number of transfer pumps (Working +	Nos.	

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for200 MLD items
		Standby)		
	xiii)	Type of transfer pumps		
	xiv)	Material of transfer pumps		
	xv)	Capacity of transfer pump	LPH@ MWC	
b)		**Sulphuric Acid Storage and Dosing System**		
	i)	Chemical dosage	mg/l	
	ii)	Number of Dosing Tanks	No.	
	iii)	Capacity of dosing tanks	M^3	
	iv)	Material of Dosing Tank		
	v)	Number of dosing pumps (Working + Standby)	Nos.	
	vi)	Type of Dosing Pumps • Casing • Shaft • Impeller		
	vii)	Material of dosing pumps		
	viii)	Capacity of dosing pump	LPH@ MWC	
	ix)	Days of Chemical storage *(min 30 days)*	days	
	x)	Size of the storage tanks	m3	
	xi)	Material of storage tanks		
	xii)	Number of transfer pumps (Working + Standby)	Nos.	

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for200 MLD items
	xiii)	Type of transfer pumps		
	xiv)	Material of transfer pumps • Casing • Shaft • Impeller		
	xv)	Capacity of transfer pumps	LPH@ MWC	
c)		**Ferric Chloride Storage and Dosing System**		
	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 *(Acid resistant tiles required)*		
	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 • Casing • Shaft • Impeller		
	xi)	Capacity of dosing pump	LPH@ MWC	

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for200 MLD items
	xii)	Days of chemical storage *(min 30 days)*	days	
	xiii)	Number of storage tanks *(min 2 required)*		
	xiv)	Size of the storage tanks	m3	
	xv)	Material of storage tanks		
	xvi)	Number of transfer pumps (Working + Standby)	Nos.	
	xvii)	Type of transfer pumps		
	xviii)	Material of transfer pumps • Casing • Shaft • Impeller		
	xix)	Capacity of transfer pumps	LPH@ MWC	
d)		**Poly-electrolyte Storage and Dosing System**		
	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		

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for200 MLD items
	x)	Material of dosing pumps • Casing • Shaft • Impeller		
	xi)	Capacity of dosing pump	LPH@ MWC	
	xii)	Days of Chemical storage *(min 30 days)*	days	
	xiii)	Storage area for solid chemical bags	m2	
e)		**Flash Mixer**		
	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 • Casing • Shaft • Impeller		
	vii)	Motor RPM	rpm	
	viii)	Residence Time *(min. 20 seconds)*	Sec.	
f)		**Flocculation Tanks**		
	(i)	MOC of flocculation tanks		
	(ii)	Raw Water Flow	m3/day	

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for200 MLD items
	(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	
	(viii)	MOC of Mixer • Casing • Shaft • Impeller		
	(ix)	Motor RPM	rpm	
g)		**Lamella Settler**		
	(i)	MOC of Settler		
	(ii)	Raw Water Flow	m3/day	
	(iii)	Nos. of settlers	Nos.	
	(iv)	MOC of tube media		
	(v)	Design Flow Through each settler	m3/hr	
	(vi)	Effective surface area per tube media	m2	
	(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 ≤ 1)*	m3/m2/hr	
	(xii)	Free board of Tube Settler tank	m	
	(xiii)	Hoppers per tube settler tank	Nos.	

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for200 MLD items
	(xiv)	Straight height of hopper	m	
	(xv)	Hydraulic retention time	Hrs	
	(xvi)	Details of structural member for tube media support		
h)		**Dissolved Air Flotation**		
	(i)	Raw Water Flow	m3/day	
	(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 *(≤ 25 m/hr)*	m/hr	
	(xi)	DAF area per cell	m2	
	(xii)	DAF cell dimensions	m	
	(xiii)	DAF Recycle Rate *(within 10–15%)*	%	
	(xiv)	No. of Recirculation Pumps (duty + standby)		
	(xv)	Material of pumps • Casing • Shaft • Impeller		
	(xvi)	Discharge flow rate	m3/hr	

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for200 MLD items
	(xvii)	Discharge pressure	m	
	(xviii)	DAF Air Dose Rate	mg/l	
	(xix)	No. of Air Compressor		
	(xx)	Air loading rate	g air /m3	
	(xxi)	Delivery pressure	m	
	(xxii)	Air Saturator Efficiency	kPa	
	(xxiii)	Air Saturator Pressure (Gauge)	m	
	(xxiv)	Float Removal mechanism		
i)		**Gravity Dual Media Filters**		
	(i)	Total Raw Water Flow to DMF	m3/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	m3/hr	
	(viii)	Effective surface area per filter unit	m2	
	(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)*	$m^3/m^2/h$	
	(xi)	Type of underdrain system		
	(xii)	Number of valves/gates per filter		
j)		**Backwash Pump**		

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for200 MLD items
	(i)	Type of Pump		
	(ii)	No. of pumps		
	(iii)	Capacity of each pump with VFD	m3/hr	
	(iv)	Discharge head	m	
	(v)	Material of pumps • Casing • Shaft • Impeller		
	(vi)	Rate of backwash water flow rate *(range 24-40 m/h)*	m/h	
	(vii)	Water + air backwash included *(If yes – additional pump with low flow required)*	Yes / No	
	(viii)	Performance Criteria • Efficiency of Pump • Motor KW & rpm • Noise level • Vibration level		
k)		**Backwash Blower**		
	(i)	Type of blower		
	(ii)	No. of blowers		
	(iii)	Capacity of each blower	Nm3/hr	
	(iv)	Material of blower		
	(v)	Rate of backwash air flow rate	m/h	
	(vi)	Discharge head	m	
	(vii)	Variable speed drive	Yes /No	

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for200 MLD items
	(viii)	Performance Criteria • Efficiency of blower • Motor KW & rpm • Noise level • Vibration level		
l)		**Filter media**		
	(i)	Bed thickness • Anthracite • Sand • Garnet • Gravel	mm	
	(ii)	Effective size • Anthracite • Sand • Garnet • Gravel	mm	
	(iii)	Uniformity coefficient • Anthracite • Sand • Garnet • Gravel		
	(iv)	Specific gravity • Anthracite • Sand • Garnet • Gravel		
m)		**Backwash/ RO Feed Tank - For 200 MLD**		
	(i)	MOC of Tank		

S. No.		Items – for 200 MLD Plant Stream	Unit	Description for200 MLD items
	(ii)	Number of Tanks		
	(iii)	Capacity of each Tank		
	(iv)	Partition in Tanks *(two chambers)*		
	(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)				
		RO Feed Booster Pump		
	(i)	Type of Pump		
	(ii)	No. of pumps (working + standby)		
	(iii)	Capacity of each pump	m3/hr @ mWC	
	(iv)	Discharge head	m	
	(v)	VFD included	(Yes/ No.)	
	(vi)	Material of pumps • Casing • Shaft • Impeller		
	(vii)	Performance Criteria • Efficiency of Pump • Motor KW & rpm • Noise level • Vibration level		

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
(b)		**ERD Feed Booster Pump**		
	(i)	Type of Pump		
	(ii)	No. of pumps (working + standby)		
	(iii)	Capacity of each pump	m3/hr @ mWC	
	(iv)	Discharge head	m	
	(v)	VFD included	(Yes/ No.)	
	(vi)	Material of pumps • Casing • Shaft • Impeller		
	(vii)	Performance Criteria • Efficiency of Pump • Motor KW & rpm • Noise level • Vibration level		
(c)		**Cartridge Filter in high pressure line**	**For 200 MLD**	
	(i)	Total Flowrate	m^3/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^3/hr	
	(vi)	Head loss	mwc	
	(vii)	Type of cartridge		
	(viii)	Cartridge filter nominal pore size	micron	
	(ix)	Unit Diameter	mm	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	(x)	Unit Height on Straight	mm	
	(xi)	Filtration rate	$m^3/m^2/hr$	
	(xii)	Material of construction • Housing • Internals • Filter elements		
(d)		**High Pressure Pump**	**For 200 MLD**	
	(i)	Type of Pump		
	(ii)	No. of pumps (working + standby)		
	(iii)	Capacity of each pump	m3/hr @ mWC	
	(iv)	Discharge head	m	
	(v)	VFD included (Yes/ No.)		
	(vi)	Material of pumps • Casing • Shaft • Impeller		
	(vii)	Performance Criteria • Efficiency of Pump • Motor KW & rpm • Noise level • Vibration level		
(e)		**ERD Feed Recirculation Pump**	**For 200 MLD**	
	(i)	Type of Pump		
	(ii)	No. of pumps (working + standby)		
	(iii)	Capacity of each pump	m3/hr @ mWC	
	(iv)	Discharge head	m	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	(v)	VFD included (Yes/ No.)		
	(vi)	Material of pumps • Casing • Shaft • Impeller		
	(vii)	Performance Criteria • Efficiency of Pump • Motor KW & rpm • Noise level • Vibration level		
(f)		**Energy Recovery Device**		
	(i)	Type of Isobaric Energy Recovery System – *(ERI preferred)*	-	
	(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 • Casing • Rotor • Shaft • Other parts in contact with seawater/concentrate		

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
(g)		**RO System** (for 200 MLD Stream)	**For 200 MLD**	
	g1	**General**		
	(i)	Net permeate output *(min 402000 m3/day to cover potable water demand in the plant)*	m3/day	
	(ii)	Gross permeate output *The gross permeate shall have enough 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 m3/day).*	m3/day	
	(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	%	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	(xiv)	Design average flux rate	l/(m^2*h)	
	(xv)	Design fouling factor	-	
	(xvi)	Design salt passage increase rate per year	%	
	(xvii)	Design flux decrease rate per year	%/annum	
	g2	**Maximum seawater condition**		
	(i)	Seawater temperature *(max temp – 32°C)*	deg C	
	(ii)	Seawater TDS *(max design TDS – 39 g/l; Plant should be able to operate at 41g/l)*	mg/l	
	(iii)	Final production rate	m^3/d	
	(iv)	Final product water TDS *(must be ≤ 450 mg/l)*	mg/l	
	(v)	Average membrane age *(manufacturer's guarantee needed)*	Years	
	(vi)	Membrane replacement rate *(manufacturer's guarantee needed)*	%/annum	
	g3	**Average Condition**		
	(i)	Seawater temperature *(max temp – 28°C)*	deg C	
	(ii)	Seawater TDS *(average TDS – 36,000 mg/l))*	mg/l	
	(iii)	Final product production	m^3/d	
	(iv)	Final product water TDS *(must be ≤ 450 mg/l)*	mg/l	
	(v)	Average membrane age *(manufacturer's guarantee needed)*	Years	
	(vii)	Membrane replacement rate *(manufacturer's guarantee needed)*	%/annum	
	g4	**Antiscalant Storage and Dosing System**		
	i)	Chemical dose rate	mg/l	
	ii)	Number of dosing tanks	No.	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	iii)	Capacity of dosing tanks	m^3	
	iv)	Material of dosing tanks		
	v)	Number of dosing pumps (Working + Standby) *(two dosing points)*	Nos.	
	vi)	Type of dosing pumps		
	vii)	Material of dosing pumps		
	viii)	Capacity of dosing pump	LPH@ MWC	
	ix)	Days of Chemical storage *(min 30 days required)*	days	
	g5	**Sodium Bisulphite Storage and Dosing System**		
	i)	Chemical dose rate	mg/l	
	ii)	Number of dosing tanks	No.	
	iii)	Capacity of dosing tanks	M^3	
	iv)	Material of dosing tanks		
	v)	Number of dosing pumps (Working + Standby) *(two dosing points)*	Nos.	
	vi)	Type of dosing pumps		
	vii)	Material of dosing pumps		
	viii)	Capacity of dosing pump	LPH@ MWC	
	ix)	Days of Chemical storage *(min 30 days required)*	days	
	g6	**Permeate Storage Tank**		
	(i)	Number of permeate tanks	No.	
	(ii)	Net volume of permeate tank *(5 ML required)*	m3	
	(iii)	Material of Construction		

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
		• Shell plate • roof plate • bottom/annular plate • girder / rafter • column • Inside Protection		
	(iv)	Water level in the permeate tank *(w.r.t CD)*		
	(v)	Permeate draw-back facilities in case of shut-down provided	Yes/No	
	g7	**Flushing Pump**	**For 200 MLD**	
	(i)	Type of Pump		
	(ii)	No. of pumps (working + standby)		
	(iii)	Capacity of each pump	m3/hr @ mWC	
	(iv)	Discharge head	m	
	(v)	VFD included (Yes/ No.)		
	(vi)	Material of pumps • Casing • Shaft • Impeller		
	(vii)	Performance Criteria • Efficiency of Pump • Motor KW & rpm • Noise level • Vibration level		
	g8	**RO Clean in Place System**		
	(i)	Number of cleaning tanks	Nos.	
	(ii)	Net volume of each cleaning tanks	m3	
	(iii)	Max. pressure vessel cleaned at once	Nos.	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	(iv)	MOC of CIP tanks		
	(v)	MOC of agitator	-	
	(vi)	**Type of Cleaning Pumps**		
	(vii)	No. of pumps (working + standby)		
	(viii)	Capacity of each pump	m3/hr @ mWC	
	(ix)	Discharge head	m	
	(x)	VFD included (Yes/ No.)		
	(xi)	Material of pumps • Casing • Shaft • Impeller		
	(xii)	Performance Criteria • Efficiency of Pump • Motor KW & rpm • Noise level • Vibration level		
	(xiii)	**Cartridge filter units for CIP**	Nos.	
	(xiv)	Nominal pore size of filters	µm	
	(xv)	Material of Construction • Housing Internals • Filter elements		
	g9	**CIP Citric Acid Storage and Dosing System**		
	i)	Chemical dose rate	mg/l	
	ii)	Number of Dosing Tanks	No.	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	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 *(min 30 days required)*	days	
	x)	No. of storage tanks *(min two tanks required)*	No.	
	xi)	Size of the storage tanks	m3	
	xii)	Material of storage tanks		
	xiii)	Number of transfer pumps (Working + Standby)	Nos.	
	xiv)	Type of transfer pumps		
	xv)	Material of transfer pumps • Casing • Shaft • Impeller		
	xvi)	Capacity of transfer pumps	LPH@ MWC	
	g10	**CIP Caustic Storage and Dosing System**		
	i)	Chemical dose rate	mg/l	
	ii)	Number of Dosing Tanks	No.	
	iii)	Capacity of dosing tanks	M3	

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	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 *(min 30 days required)*	days	
	x)	No. of storage tanks *(min two tanks required)*	No.	
	xi)	Size of the storage tanks	m3	
	xii)	Material of storage tanks		
	xiii)	Number of transfer pumps (Working + Standby)	Nos.	
	xiv)	Type of transfer pumps		
	xv)	Material of transfer pumps • Casing • Shaft • Impeller		
	xvi)	Capacity of transfer pumps	LPH@ MWC	
	g11	**CIP HCl Storage and Dosing System**		
	i)	Chemical dose rate	mg/l	
	ii)	Number of Dosing Tanks	No.	
	iii)	Capacity of dosing tanks	M3	
	iv)	Material of Dosing Tank		

S. No.	Items for 200 MLD Stream		Unit	Description For 200 MLD
	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 *(min 30 days required)*	days	
	x)	No. of storage tanks (min two tanks required)	No.	
	xi)	Size of the storage tanks	m3	
	xii)	Material of storage tanks		
	xiii)	Number of transfer pumps (Working + Standby)	Nos.	
	xiv)	Type of transfer pumps		
	xv)	Material of transfer pumps • Casing • Shaft • Impeller		
	xvi)	Capacity of transfer pumps	LPH@ MWC	
		Other related items		
	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)		**Limestone Filter (LSF)**	**For 200 MLD**	
	(i)	Treated water flow rate *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 0.5% additional flow (402000 m3/day).*	m3/d	
	(ii)	Limestone building bypass	%	
	(iii)	Material of the Limestone Filter		
	(iv)	No. of filter modules per stream		
	(v)	Net surface area per module	m^2	
	(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	$m^3/m^2.h$	
	(xi)	Module surface loading rate N-1	$m3/m^2.h$	
	(xii)	CO2 consumption	g/m3	
	(xiii)	CO2 daily consumption	T/day	
	(xiv)	Total hardness in water after remineralization *(80 mg/l as CaCO3 required)*	mg/l CaCO3	
	(xv)	Calcium hardness addition in product water	mg/l CaCO3	
	(xvi)	Type of CO_2 dosing system		
	(xvii)	MOC of CO_2 pipe, valves, and Static Mixer		
	(xviii)	Capacity of CO_2 – storage tank	days	

	(xix)	MOC of CO_2 tank		
(b)		**LSF Backwash Pump**		
	(i)	Type of Pump		
	(ii)	No. of pumps		
	(iii)	Capacity of each pump with VFD	m3/hr	
	(iv)	Discharge head	m	
	(v)	Material of pumps • Casing • Shaft • Impeller		
	(vi)	Rate of backwash water flow rate	m/h	
	(vii)	Performance Criteria • Efficiency of Pump • Motor KW & rpm • Noise level • Vibration level		
(c)		**LSF Backwash Blower**		
	(i)	Type of blower		
	(ii)	No. of blowers		
	(iii)	Capacity of each blower	Nm3/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 • Efficiency of blower • Motor KW & rpm		

		• Noise level • Vibration level		
(d)		**Hypochlorite Storage and Dosing System**		
	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	
	xvi)	Days of Chemical storage *(min 30 days)*	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 • Casing • Shaft • Impeller		
	xxii)	Capacity of transfer pumps	LPH@ MWC	
(e)		**pH Adjustment - Caustic Storage and Dosing System**		
	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 *(min 30 days)*	days	
	x)	Size of the storage tanks	m3	
	xi)	Material of storage tanks		
	xii)	Number of transfer pumps (Working + Standby)	Nos.	
	xiii)	Type of transfer pumps		
	xiv)	Material of transfer pumps • Casing • Shaft • Impeller		
	xv)	Capacity of transfer pumps	LPH@ MWC	

6.0 Sludge Treatment

S. No.		**Item for 400 MLD Stream**	**Unit**	**Description**
(a)		**Neutralization Sump**		
	(i)	No. of Sumps		
	(ii)	Construction Material		
	(iii)	Area (L x B)	m2	
	(iv)	Tank volume	m3	

	(v)	Water height	m	
	(vi)	Free board	m	
	(vii)	Pumps vault size	m x m x m	
(b)		**Neutralization Effluent Pumps**		
	(i)	Type of Pump		
	(ii)	No. of pumps		
	(iii)	Capacity of each pump with VFD	m3/hr	
	(iv)	Discharge head	m	
	(v)	Material of pumps • Casing • Shaft • Impeller		
	(vi)	Rate of backwash water flow rate	m/h	
	(vii)	Performance Criteria • Efficiency of Pump • Motor KW & rpm • Noise level • Vibration level		
(c)		**Waste Sludge Balancing Tank**		
	(i)	Tank type		
	(ii)	No. of tanks		
	(iii)	Construction Material		
	(iv)	Tank area	m x m	
	(v)	Tank volume	m3	
	(vi)	Water height	m	
(d)		**Submersible Mixer**		
	(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	
(e)		**Thickener Feed Pumps**		
	(i)	Type of Pump		
	(ii)	No. of pumps		
	(iii)	Capacity of each pump with VFD	m3/hr	
	(iv)	Discharge head	m	
	(v)	Material of pumps • Casing • Shaft • Impeller		
	(vi)	Rate of backwash water flow rate	m/h	
	(vii)	Performance Criteria		

		• Efficiency of Pump • Motor KW & rpm • Noise level • Vibration level		
(f)		**Static Mixer after polymer dose**		
	(i)	Number of duty units	-	
	(ii)	Number of standby units	-	
	(iii)	Manufacturer	-	
	(iv)	Type	-	
	(v)	Design flow of one unit	m^3/h	
	(vi)	Pressure loss at design flow	m	
	(vii)	Maximum flow of one unit	m^3/h	
	(viii)	Pressure loss at maximum flow	m	
	(ix)	Material of housing	-	
	(x)	Materials of internals	-	
(g)		**Polyelectrolyte Storage and Dosing System for Thickener and BFP**		
	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	days	
		Poly solution Agitator:		
	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		
(h)		**Thickener**		
	(i)	Manufacturer		
	(ii)	Type		
	(iii)	Quantity	Nos	
	(iv)	Size (Diameter x SWD x FB)	m	
	(v)	Scraper speed	rpm	
	(vi)	• Torque rating • Design output torque • Shut-off torque	N-m	
	(vii)	Feed rate per thickener	m^3/hr	
	(viii)	Feed well size	mm	
	(ix)	Walkway (width x Height)	mm	
	(x)	Weir plate size(Thick x width)	mm	

		Surface Preparation & Protection:		
	(i)	Wetted parts		
	(ii)	Exposed parts		
		Material of Construction:		
	(i)	Bridge and Superstructure		
	(ii)	Feed well		
	(iii)	Walkway Gratings		
	(iv)	Squeegees		
	(v)	Weir plate		
	(vi)	Clamps & Hardware		
		Automatic lifting Device-provided		
	(i)	Motor rating	KW	
	(ii)	Motor speed	rpm	
	(iii)	Motor Make		
	(iv)	Protection		
(i)		**Thickened Sludge Holding Tank**		
	(i)	Tank type		
	(ii)	No. of tanks		
	(iii)	Construction Material		
	(iv)	Tank area	mxm	
	(v)	Tank volume	m3	
	(vi)	Water height	m	
		Submersible Mixer/Agitator		
	(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	
(j)		**Thickener Feed Pumps**		
	(i)	Type of Pump		
	(ii)	No. of pumps		
	(iii)	Capacity of each pump with VFD	m3/hr	
	(iv)	Discharge head	m	
	(v)	Material of pumps • Casing • Shaft • Impeller		
	(vi)	Rate of backwash water flow rate	m/h	
	(vii)	Performance Criteria • Efficiency of Pump		

		• Motor KW & rpm • Noise level • Vibration level		
(k)		**BFP**		
	(i)	Manufacturer		
	(ii)	Type		
	(iii)	Model		
	(iv)	Number of BFPs		
	(v)	Feed rate per BFP	m^3/h	
	(vi)	Dewatered sludge cake thickness *(>25% dried solids required)*	% dried solids	
	(vii)	**N**oise level (dBA) at 1 m distance from the machine	dBA	
	(viii)	Pressure roll configuration		
	(ix)	Feed pressure required	Kg/cm^2	
	(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		
		Material of Construction:		
	(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		
		Belt Press Drives		
	(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	
		Conveyor Drive		
	(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	
		Belt Conveyor system		
	(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.		
(l)		**BFP Building**		
	(i)	**Ground Floor**		
	(ii)	Polymer tank and storage area	m x m = m2	
	(iii)	Thickened sludge Pump room area	m x m = m2	
	(iv)	Truck loading area	m x m = m2	
		Ist Floor		
	(i)	BFP machine floor area	m x m = m2	
	(ii)	Electrical room area	m x m = m2	
	(iii)	Local control room area	m x m = m2	
(m)		**Crane – BFP Building**		
	(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	
		Hoisting Rope:		
	(i)	- Diameter	mm	
	(ii)	- Construction		
	(iii)	-Quality of steel		
	(iv)	- Minimum Breaking Load	Kgs	
	(v)	- Factor of safety		
		Motors for Hoist/Long travel/cross travel :		
	(i)	Make		
	(ii)	Type		
	(iii)	Rating	kW	
		Details of Brakes for Hoist/cross travel/Long travel:		
	(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

(a)		**Service Water Pumps**		**For 200 MLD**
	(i)	Type of Pump		
	(ii)	No. of pumps		
	(iii)	Capacity of each pump	m3/hr	
	(iv)	Discharge head	m	
	(v)	Variable Speed Drive included	Yes/No.	
	(vi)	Material of pumps • Casing • Shaft • Impeller		
	(vii)	Performance Criteria • Efficiency of Pump • Motor KW & rpm • Noise level • Vibration level		
(b)		**Service Water Tanks**		
	(i)	**No. of service water tanks**		
	(ii)	Capacity of each service water tank	m3	
	(iii)	Tank dimensions (LxBxH)	mxmxm	
		Tank location – Roof of • Admin building • BFP building • Chemical buildings •	mxmxm	

7.2 Valves

S. No.	Item		Unit	Description
(a)		**Valve**		

S. No.	Item		Unit	Description
	(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)		**Valve Actuator**		
	(i)	Manufacturer		
	(ii)	Type		
	(iii)	Model		

S. No.	Item		Unit	Description
	(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
		Non-return valves		
	(i)	Manufacturer		
	(ii)	Type		
	(iii)	Model		
	(iv)	Service		
	(v)	Quantity	nos.	
	(vi)	Size	mm	
	(vii)	Rating	Bar	
	(viii)	Test Pressure	Bar	
	(ix)	Design standard		
	(x)	Material of construction:		
		• Body		
		• Disc/plates		
		• Spring		
		• Shaft		
	(xi)	Flange drilling standard		

7.5 Sluice Valves

S. No.	Item		Unit	Description
(a)		**Sluice Valves**		
	(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)	**Sluice Valve Actuators**			
	(i)	Manufacturer		
	(ii)	Type		

S. No.	Item		Unit	Description
	(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^3/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		

S. No.	Item		Unit	Description
	(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 at Intake Well

S. No.	Item		Unit	Description
	vi)	Type of pump		
	vii)	Total Quantity (working + standby)	Nos.	
	viii)	Capacity of each Pump	m3/hr	
	ix)	Materials of Construction • Casing • Shaft • Impeller	-	
	x)	Performance criteria • Efficiency of Pump • Motor KW & rpm • Noise level • Vibration level		

8.0 Plant Guarantees

8.1 Plant Process Guarantees

S. No.	Item		Unit	Description
(a)	**Product Water Quality at all Feed Seawater Conditions**			
	(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 (> 80 mg/l as CaCO3)	mg/l as CaCO3	
	(viii)	pH	6.5 – 8.0	
	(ix)	LSI		
(b)	**Thickener Sludge/ Supernatant**			
	(i)	Thickened Sludge solid concentration *(Required within 3 -5%)*	%	
	(ii)	Supernatant TSS: *(Required <200 mg/l)*	mg/l	
(c)	**BFP Sludge/ Wash water**			
	(i)	BFP Sludge solid concentration *(Required ≥ 25%)*	%	
	(ii)	Rate of washwater flow rate	m3/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	m3/ton of solid	
(d)	**Wastewater discharge to sea**			
	(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
General		
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)		
Distributed Control System		
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		

IO Details		
High-Level System Architecture		
Engineering Documentation		
Commissioning Collaboration		
Communication System		
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		
Condition Monitoring System		
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		
Data Interface equipment		

IO Details		
High-Level System Architecture		
Engineering Documentation		
Commissioning Collaboration		
Reporting System		
Make		
Type / Model		
Origin		
Life Cycle		
Life Cycle expectancy		
Warranty details		
Service Support		
Collaborations (If any)		
Desalination SWRO reference		
Technical Support		
CCTV Surveillance System		
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		
Collaborations (If any)		
Technical Support		

Spares Support		
Software Details (List all software and brief functionality)		
Access Control & Security System		
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)		
Public Addressing System		
Make		
Type / Model		
Origin		
PA System Details		
PA Zoning Details		
PA Power Amplifier Details		
Loud Speaker System and Loop		
Central Control PA system		
Warranty details		
Service Support		

Collaborations (If any)		
Technical Support		
Plant PABX & LAN Communication System		
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
Level Measuring System Make / Origin Accuracy Origin		
Ultrasonic Level Transmitter Make / Origin Accuracy Sensor type		
Conductivity type Level Switch		

Item	Unit	Description
Make Origin No. of electrodes Accuracy	Nos.	
Pressure Gauges Make / Origin Accuracy Over range Protection Blow out Protection Fill Fluid Process Connection Type		
Differential Pressure Measuring System Make / Origin Accuracy Manifold Sensor Type		
Open Channel Flow Measuring System Make / Origin Accuracy Sensor Type Sensor Mounting		
Electromagnetic Flowmeter Make / Origin Accuracy Electrode Types Grounding Electrode Type Accuracy for Potable Water Billing Flow meter		
Ultrasonic Flowmeter Make / Origin Accuracy Measurement Technology		
Insertion Type Flowmeter Make / Origin Accuracy Specific Application Area		
Turbidity Analyser Make / Origin Type Measurement Technology Calibration Methods / Type Calibration Frequency		

Item	Unit	Description
Reagents used if any Accuracy Debubbler Self-Diagnostics Features Light Source Cleaning Features Maintenance Features (Viper / Air) Mode of Sampling		
Ammonia Analyser Make / Origin Type Measurement Technology Calibration Method / Type Calibration Frequency Reagents used if any Mode of Sampling Accuracy		
TOC Analyser 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		
Boron Analyser 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		
Residual Chlorine Analyser Make / Origin		

Item	Unit	Description
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**		
SDI Measurement 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		
pH Measurement 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 compensation Accuracy		
Temperature Measurement Make / Origin Sensor Type		

Item	Unit	Description
Accuracy		
Conductivity Measurement Make / Origin Sensor Type Accuracy Response Time		
Alkalinity Analyser 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		
ORP Measurement Make / Origin Sensor Type Calibration Method / Frequency Accuracy Response Time		
TSS Measurement 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		
Rotameter Make Type Accuracy		

Item	Unit	Description
PLC, Instrument Control Panel with LCD touch screen, Power Supply, Switches, Pushbuttons etc.		
Make / Model		
Type		
LCD touch screen		
Model		
Dimension	mm	
Definition	pixels	
Quantities	Nos.	
PLC:		
Make / Model		
I / O modules		
Model	Nos.	
Quantity approx. for:	Nos.	
Intake Works	Nos.	
Pretreatment	Nos.	
RO System	Nos.	
Post Treatment	Nos.	
Sludge Treatment	Nos.	
Substation	Nos.	
Product water and CW Tanks	Nos.	
Analogue Input modules		
Model	Nos.	
Quantity approx. for:	Nos.	
Intake Works	Nos.	
Pretreatment	Nos.	
RO System	Nos.	
Post Treatment	Nos.	
Sludge Treatment	Nos.	
Substation	Nos.	
Product water and CW Tanks	Nos.	
Analogue output modules		
Model	Nos.	
Quantity approx.. for:	Nos.	
Intake Works	Nos.	
Pretreatment	Nos.	
RO System	Nos.	
	Nos.	

Item	Unit	Description
Post Treatment	Nos.	
Sludge Treatment	Nos.	
Substation		
Product water and CW Tanks		
	Nos.	
Communication module		
Model		
Quantity	Nos.	
Remote I / O module		
Model		
Quantity		
Junction Boxes Make		
Control and Instrumentation Cables		
GENERAL		
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

33 kV Metal clad Switchgear

Item	Unit	Description
Switchgear Reference Manufacturer Type reference Applicable standard		
Switchgear Details 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	
Operating Mechanism Rated voltage of shunt trip coil Rating of shunt trip coil	 V W	

3.3 KV Metal clad Switchgear

Item	Unit	Description
Switchgear Reference Manufacturer Type reference Applicable standard		
Switchgear Details 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	
Operating Mechanism Rated voltage of shunt trip coil Rating of shunt trip coil	 V W	

Power Transformers

Item	Unit	Description	
		Main	**Auxiliary**
Transformer Reference			
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
Main Switchboard Reference		
Manufacturer/assembler		
Applicable standard		
Dimensions-width	mm	
-height	mm	
- depth	mm	
Enclosure protection rating	IP	for seconds

Item	Unit	Description
Busbar current rating	A	
Short-time withstand current for 1 Sec	kA	
Short circuit certifying authority		
Air Circuit Breakers		
Manufacturer		
Applicable standard		
Type designation	V	
Rated voltage	A	
Rated current	kA	for seconds
Short-time current and duration		
Fused Switches		
Manufacturer		
Applicable standard		
Type designation		
Motor Control Equipment		
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
Control panels Reference		
Manufacturer/assembler		
Applicable standard		
Dimensions - width	mm	
- height	mm	
- depth	mm	
Enclosure protection rating	IP	for seconds
Busbar current rating	A	
Short-time withstand current for	kA	

Item	Unit	Description
1 Sec Short circuit certifying authority		
Fused Switches Manufacturer Applicable standard Type designation		
Motor Control Equipment Direct on line starters Manufacturer Rated voltage Type	 V	
PLC Manufacturer Applicable standard Type designation		

Provide details of each Control panel proposed for the Works.

Power Capacitors MV

Item	Unit	Description
Power Capacitors Reference 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
Power Capacitors Reference		

Item	Unit	Description
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
33 kV Power Cables		
Manufacturer		
Applicable standard		
Conductors -	material	
cross-sectional area	mm^2	
Cable construction		
Armouring		
3.3 kV Power Cables		
Manufacturer		
Conductors -	material	
cross-sectional area	mm^2	
Cable construction		
Armouring		
650/1 100 V Power Cables		
Manufacturer		
Type		
Construction		
Standard		

Control Cables

Item	Unit	Description
Control Cables		
Manufacturer		
Applicable standard		
Type		
Construction		
Standard		

Cable Ladder and Tray

Item	Unit	Description
Cable Ladder		
Manufacturer		
Applicable standard		
Applicable standard		
Ladder type		
Duty		
Rung type	mm	
Ladder material	mm	
Ladder finish		
Ladder widths		
Ladder supports and fixings		
- type		
- material		
- finish		
Cable Tray		
Manufacturer		
Cable tray type		
Material		
Finish		
Tray widths	mm	
Cable tray supports and fixings		
- type		
- material		

Item	Unit	Description
- finish		

Uninterruptible Power Supply

Item	Unit	Description
Ups Details		
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	
Battery Details		
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
Battery Charger Details		
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	
Battery Details		
Manufacturer		
Type reference		
Battery type		

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

415 V Non-Segregated Busducts

Item	Unit	Description
Manufacturer's name & address		
Applicable Standards		
Type of busduct		
Material and cross section of busbars	mm^2	
Rated voltage	Volts	
Maximum voltage at which busduct 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	^{O}C	
Busbars	^{O}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 busduct	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		
Isolator Make Type designation		
Fuses Make Type Applicable standard		
Conductor Make Type and duty Applicable standard		
Synchronous timer Make Type Applicable standard		
Lighting fixtures and Accessories Make of lighting fixtures & accessories Catalogue for each type of fixtures attached as Annexure No.		
Switches Make		

Item	Unit	Description
Type Catalogue attached as annexure No.: Applicable standard		
Receptacles/Sockets Make Type Applicable standard		
Junction boxes Make Type Material Applicable standard		
Terminal Blocks Make Type Rating		
Rigid steel Conduits/Fittings & accessories Make Material Applicable standard		
Hume Pipes Make Applicable standard		
Flexible Steel standard Make Applicable standard		
Lighting wires Make Applicable standard		
Lighting Poles Make Applicable standard Type Pole height		
Lighting masts 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		
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		

Item	Unit	Description
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.

TECHNICAL SCHEDULE-5-DESALINATION PLANT OPERATING DETAILS

(to be completed by the Bidder)

Item	Unit	Description
ım Feed Seawater Flow Rate	MLD	
m Feed Seawater Flow Rate	MLD	
	MLD	
roduct Flow Rate	MLD	
duct Flow Rate		
al loads	kVA	
(1) Total connected load *(Please provide details of the loads in excel sheet)*	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		
al usage	Tonnes/year	
	Tonnes/year	
(1) Hypochlorite for Shock Chlorination	Tonnes/year	
(2) Hypochlorite for Pre Chlorination	Tonnes/year	
(3) FeCl3 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) CO2 for remineralization	Tonnes/year	
(11) CaCO3 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		
(19) Any other chemical		
	%/year	
	%/year	
m Spares required per annum	%/year	
(Contractor to furnish the details)	%/year	
(1) Mechanical (percent of total mechanical items values)		
(2) Electrical (percent of total electrical items values)		
(3) Instrumentation (percent of total Instrumentation Items values)		
(4) Laboratory (percent of total laboratory items values)		

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 as well as price 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) of electrical energy consumption required for guaranteed performance of the Seawater Desalination Plant for full throughput of the rates quoted. 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 considering inflation (if so provided in quoted rates).
- 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. The unit cost (Rs /KWH) of the electrical energy consumption as indicated in the Bid documents by the Employer will be taken for bid evaluation. The discounting rate 8% per annum to be taken for (NPV) calculations.
- The NPV of the required operation cost for twenty (20) years of O&M of 400 MLD DSP to the Employer shall be calculated for each of the bidders after adding the energy charges to the O&M Cost.

c) Final Determination of bids

- Computed evaluated cost (a) and net present value (b) will be considered to determine the lowest evaluated bid.

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. 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)*

2.2 The guaranteed maximum Energy consumption per m3 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	Year10
Specific Energy Consumption, kWh/m3 of Product water										
	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Specific Energy Consumption, kWh/m3 of Product water										

Bidder shall be required to demonstrate the example of the power consumption at their plants constructed elsewhere with the similar processes.

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 CaCO3	80
LSI		Positive

2.6 Wastewater Discharge to Sea

Total Dissolved Solids (TDS) *Should correlate with EIA dispersion guidelines*	Not more than _____ mg/l
Total Suspended Solids (TSS) *Should correlate with EIA dispersion guidelines*	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

S. No.	Chemicals	Maximum Rate of Consumption
(iii)	FeCl3 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)	CO2 for remineralization	_____Kg /ML product water
(x)	CaCO3 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	tonnes	

S. No.	Chemicals	Units	Maximum Consumption as supplied per year
	(Non Food grade) (100%)		
(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)	NaOH for CIP and Neutralization (50%)	m3	
(xvi	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

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

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)

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.*]

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

*As listed in Section III.

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.*]

Name of Bidder

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

[*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 Bidder 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.]

Item of equipment		
Equipment information	**Name of manufacturer**	**Model and power rating**
	Capacity	**Year of manufacture**
Current status	**Current location**	
	Details of current commitments	
Source	**Indicate source of the equipment** ☐ **Owned** ☐ **Rented** ☐ **Leased** ☐ **Specially manufactured**	

Omit the following information for equipment owned by the Bidder.

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

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

[*The Employer shall specify what information is required to provide for Spare Parts as per Employer's Requirements and the Bidder shall insert information.*]

Required items of Spare Parts	Proposed items of Spare Parts

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:[*insert full name*]
2. In case of JV, legal name of the representative member and of each member: [*insert full name of each member in the JV and specify the representative member*]
3. Bidder's actual or intended country of registration: [*insert country of registration*]
4. Bidder's actual or intended year of incorporation: [*insert year of incorporation*]
5. Bidder's legal address in country of registration: [*insert street/number/town or city/country*]
6. Bidder's authorized representative information Name: [*insert full name*] Address: [*inset street/number/town or city/country*] Telephone/Fax numbers: [*insert telephone/fax numbers, including country and city codes*] Email Address: [*insert E-mail address*]
7. Attached are copies of original documents of: ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of legal entity named above, in accordance with ITB 4.3. ☐ In case of JV, letter of intent to form JV or JV agreement, in accordance with ITB 4.1. 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: [*insert full name*]
2. Bidder's Party legal name: [*insert full name of Bidder's Party*]
3. Bidder's Party country of registration: [*insert country of registration*]
4. Bidder's Party year of incorporation: [*insert year of incorporation*]
5. Bidder's Party legal address in country of registration: [*insert street/number/town or city/country*]
6. Bidder's Party authorized representative information Name: [*insert full name*] Address: [*insert street/number/town or city/country*] Telephone/Fax numbers: [*insert telephone/fax numbers, including country and city codes*] E-mail address: [*insert E-mail address*]
7. Attached are copies of original documents of ☐ 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

Non-Performing Contracts			
☐ Contract non-performance did not occur since 1st January [*insert year*], in accordance with the Prequalification criteria, or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.1, as appropriate. ☐ Contract(s) not performed since 1st January [*insert year*], in accordance with the Prequalification criteria, or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.1, as appropriate, is(are) indicated below:			
Year	**Non- performed portion of Contract**	**Contract Identification**	**Total Contract Amount (current value, currency, exchange rate and USD equivalent)**
[*insert year*]	[*insert amount and percentage*]	• Contract Identification: [*indicate complete Contract name, number, and any other identification*] • Name of Employer: [*insert full name*] • Address of Employer: [*insert street/city/country*] • Reason(s) for non-performance: [*indicate main reason(s)*]	[*insert amount*]

2. Pending Litigation

Pending Litigation				
☐ No pending litigation in accordance with the Prequalification criteria, or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.2, as appropriate. ☐ 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:				
Year of dispute	**Amount in dispute (currency)**	**Outcome as Percentage of Net Worth**	**Contract Identification**	**Total Contract Amount (current value, currency, exchange rate and USD equivalent)**
[*insert year*]	[*insert amount*]	[*insert percentage*]	• Contract Identification: [*indicate complete Contract name, number, and any other identification*] • Name of Employer: [*insert full name*] • • Address of Employer: [*insert street/ city/ country*] • Matter in dispute: [*indicate main issues in dispute*] • Status of dispute: [*indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary*]	[*insert amount*]

3. Litigation History

Litigation History		
☐ No court/arbitral award decisions against the Bidder since 1st January [*insert year*], in accordance with the Prequalification criteria, or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.3, as appropriate. ☐ Court/arbitral award decisions against the Bidder since 1st 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:		
Year of award	**Contract Identification**	**Total Contract Amount (current value, currency, exchange rate and USD equivalent)**
[*insert year*]	• Contract Identification: [*indicate complete Contract name, number, and any other identification* • Name of Employer: [*insert full name*] • Address of Employer: [*insert street/city/country*] • Matter in dispute: [*indicate main issues in dispute*] • Party who initiated the dispute: [*indicate "Employer" or "Contractor"*] • Status of dispute: [*indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary*]	[*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
Statement of Financial Position (Information from Balance Sheet)					
Total Assets (TA)					
Total Liabilities (TL)					
Net Worth (NW)					
Current Assets (CA)					
Current Liabilities (CL)					
Information from Income Statement					
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[2] for the [*number of years*] years required above; and complying with the requirements.

[2] 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*]
Average Annual Construction Turnover *			

* Total USD equivalent for all years divided by the total number of years, in accordance with the Prequalification criteria, or Section III, Evaluation and Qualification Criteria, Sub- Factor 2.3.2, as appropriate.

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[3].

<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

[3] 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.

debarred by the World Bank Group for a period more than one year, unless on the date 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.

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 a bid guarantee.

At the request of the Applicant, we, as Guarantor, hereby 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[4].

[signature(s)]

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

[4] 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.*]