

**GOVERNMENT OF THE DEMOCRATIC SOCIALIST REPUBLIC
OF SRI LANKA**

MINISTRY OF CITY PLANNING & WATER SUPPLY

NATIONAL WATER SUPPLY AND DRAINAGE BOARD

**JAFFNA KILINCHCHI WATER SUPPLY AND SANITATION PROJECT
– ADDITIONAL FINANCING**

LOAN NO: 37378-SRI

**Design, Build and Operate (DBO) of a 24 MLD
Sea Water Reverse Osmosis (SWRO)
Desalination Plant at Thalaiyadi, Jaffna
District, Sri Lanka**

**CONTRACT NO.: PEIC/JKWSSP/SEA WATER REVERSE
OSMOSIS PLANT/2015/01**

**Bidding Document
(Revised)**

**Project Director's Office
Jaffna-Kilinochchi Water Supply and Sanitation Project
National Water Supply and Drainage Board
KKS Road
Jaffna
Sri Lanka
May 2017**

Preface

This Bidding Document for the design, build and operation of the Jaffna Kilinochchi Sea Water Reverse Osmosis Desalination Plant has been prepared by the National Water Supply and Drainage Board (NWSDB) who are the Executing Agency (EA) of the Jaffna Kilinochchi Water Supply and Sanitation Project. It is based on the Standard Bidding Document for Procurement of Plant – Design, Supply, and Installation (SBD Plant) issued by the Asian Development Bank dated December 2015, but adjusted to incorporate the Conditions of Contract for Design, Build and Operate Projects (Gold Book) prepared by the Fédération Internationale des Ingénieurs-Conseil, (FIDIC) First Edition 2008.

ADB's SBD Plant has the structure and the provisions of the Master Procurement Document entitled "Procurement of Plant – Design, Supply, and Installation", prepared by multilateral development banks and other public international financial institutions except where ADB-specific considerations have required a change.

This Revised Bidding Document (May 2017) shall supersede the Bidding Document (December 2016) issued before.

Single Stage Two Envelope Bidding Procedure

In the single-stage, two-envelope procedure, the technical proposal is opened first and reviewed to determine responsiveness to the bidding documents. Only the financial proposals of bidders with responsive technical proposals are opened for evaluation and comparison. The financial proposals of bidders whose technical proposals are not responsive shall be returned unopened.

The proposals are evaluated, and following ADB's approval, the contract is awarded to the bidder whose bid has been determined to be the lowest evaluated substantially responsive bid.

Table of Contents - Summary Description

PART I BIDDING PROCEDURES

Section 1 - Instructions to Bidders (ITB)----- 1-1

This Section specifies the procedures by Bidders in the preparation and submission of their Bids following a Single-Stage, Two-Envelope bidding procedure. Information is also provided on the submission, opening, and evaluation of bids and on the award of contract.

Section 2 - Bid Data Sheet (BDS) ----- 2-1

This Section consists of provisions that are specific to each procurement and supplement the information or requirements included in Section 1 - Instructions to Bidders.

Section 3 - Evaluation and Qualification Criteria (EQC) ----- 3-1

This Section contains the bid evaluation criteria to determine the lowest evaluated bid and specifies the necessary qualifications of Bidders.

Section 4 - Bidding Forms (BDF) ----- 4-1

This Section contains the forms which are to be completed by the Bidder and submitted as part of its Bid.

Section 5 - Eligible Countries (ELC) ----- 5-1

This Section contains the list of eligible countries.

PART II REQUIREMENTS

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This Section contains the Scope of Supply of Plant and Services, Specifications, the Drawings, and Supplementary Information that describe the plant and services to be procured, Personnel Requirements, Equipment Requirements, Certificates, and Change Orders.

PART III CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section 7 - General Conditions of Contract (GCC) ----- 7-1

This Section contains the general clauses to be applied in all contracts. These Conditions are subject to the variations and additions set out in Section 8 (Particular Conditions of Contract).

Section 8 - Particular Conditions of Contract (PCC) ----- 8-1

This Section contains provisions that are specific to each contract and that modify or supplement the GCC. Whenever there is a conflict, the provisions herein shall prevail over those in the GCC. The clause number of the PCC is the corresponding clause number of the GCC.

Section 9 - Contract Forms (COF)----- 9-1

This Section contains forms, which, once completed, will form part of the Contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.

Section 1 - Instructions to Bidders

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Section 1 - Instructions to Bidders

A. General

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|--------------------------------|--|
| 1. Scope of Bid | <p>1.1 In connection with the Invitation for Bids (IFB) indicated in the Bid Data Sheet (BDS), the Employer, as indicated in the BDS, issues this Bidding Document for the procurement of plant and services as specified in Section 6 (Employer's Requirements). The name, identification, and number of lot/s (contract/s) of the international competitive bidding (ICB) are provided in the BDS.</p> <p>1.2 Unless otherwise stated, throughout this Bidding Document definitions and interpretations shall be as prescribed in Section 7 (General Conditions of Contract).</p> |
| 2. Source of Funds | <p>2.1 The Borrower or Recipient (hereinafter called "Borrower") indicated in the BDS has applied for or received financing (hereinafter called "funds") from the Asian Development Bank (hereinafter called "ADB") toward the cost of the project named in the BDS. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.</p> <p>2.2 Payments by ADB will be made only at the request of the Borrower and upon approval by ADB in accordance with the terms and conditions of the Financing Agreement between the Borrower and ADB (hereinafter called "Financing Agreement"), and will be subject in all respects to the terms and conditions of that Financing Agreement. No party other than the Borrower shall derive any rights from the Financing Agreement or have any claim to the funds.</p> |
| 3. Fraud and Corruption | <p>3.1 ADB's Anticorruption Policy requires Borrowers (including beneficiaries of ADB-financed activity), as well as Bidders, Suppliers, and Contractors under ADB-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, ADB</p> <p>(a) defines, for the purposes of this provision, the terms set forth below as follows:</p> <ul style="list-style-type: none"> (i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party; (ii) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation; (iii) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party; (iv) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party; |

- (v) "obstructive practice" means (a) deliberately destroying, falsifying, altering, or concealing of evidence material to an ADB investigation; (b) making false statements to investigators in order to materially impede an ADB investigation; (c) failing to comply with requests to provide information, documents, or records in connection with an Office of Anticorruption and Integrity (OAI) investigation; (d) threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or (e) materially impeding ADB's contractual rights of audit or access to information; and
 - (vi) "integrity violation" is any act which violates ADB's Anticorruption Policy, including (i) to (v) above and the following: abuse, conflict of interest, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB's Anticorruption Policy, including failure to adhere to the highest ethical standard.
- (b) will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;
 - (c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of ADB-financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to ADB to remedy the situation;
 - (d) will impose remedial actions on a firm or an individual, at any time, in accordance with ADB's Anticorruption Policy and Integrity Principles and Guidelines (both as amended from time to time), including declaring ineligible, either indefinitely or for a stated period of time, to participate¹ in ADB-financed, administered, or supported activities or to benefit from an ADB-financed, administered, or supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices or other integrity violations; and
 - (e) will have the right to require that a provision be included in the Bidding Documents and in contracts financed by ADB, requiring Bidders, suppliers and contractors to permit ADB or its representative to inspect their accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by ADB.

3.2 Furthermore, Bidders shall be aware of the provision stated in the General Conditions of Contract (GCC 9.6 and 42.2.1 (c)).

4. Eligible Bidders

4.1 A Bidder may be a natural person, private entity, or government-owned enterprise subject to ITB 4.5 - or any combination of them with a formal intent to enter into an agreement or under an existing agreement in the

¹ Whether as a Contractor, Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document).

form of a Joint Venture. In the case of a Joint Venture,

- (a) all partners shall be jointly and severally liable, and
 - (b) the Joint Venture shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the partners of the Joint Venture during the bidding process and, in the event the Joint Venture is awarded the Contract, during contract execution.
- 4.2 A Bidder, and all partners constituting the Bidder, shall have the nationality of an eligible country, in accordance with Section 5 (Eligible Countries). A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.
- 4.3 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process if any of, including but not limited to, the following apply:
- (a) they have controlling shareholders in common; or
 - (b) they receive or have received any direct or indirect subsidy from any of them; or
 - (c) they have the same legal representative for purposes of this bid; or
 - (d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to material information about or improperly influence the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or
 - (e) a Bidder participates in more than one bid in this bidding process, either individually or as a partner in a joint venture, except for alternative offers permitted under ITB 13. This will result in the disqualification of all Bids in which it is involved. However, subject to any finding of a conflict of interest in terms of ITB 4.3 (a) - (d) above, this does not limit the participation of a Bidder as a subcontractor in another Bid or of a firm as a subcontractor in more than one Bid; or
 - (f) a Bidder or any affiliated entity, participated as a consultant in the preparation of the design or technical specifications of the plant and services that are the subject of the Bid; or
 - (g) a Bidder was affiliated with a firm or entity that has been hired (or is proposed to be hired) by the Employer or Borrower as Project Manager for the Contract.
- 4.4 A firm shall not be eligible to participate in any procurement activities under an ADB-financed, administered, or supported project while under temporary suspension or debarment by ADB pursuant to its Anticorruption Policy (see ITB 3), whether such debarment was directly imposed by ADB, or enforced by ADB pursuant to the Agreement for Mutual Enforcement of Debarment Decisions. A bid from a temporary suspended or debarred firm will be rejected.

- 4.5 Government-owned enterprises in the Borrower's country shall be eligible only if they can establish that they (i) are legally and financially autonomous, (ii) operate under commercial law, and (iii) are not dependent agencies of the Employer.
- 4.6 Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.
- 4.7 Firms shall be excluded if by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's country prohibits any import of goods or contracting of works or services from that country or any payments to persons or entities in that country.
- 4.8 In case a prequalification process has been conducted prior to the bidding process, this bidding is open only to prequalified Bidders.

5. Eligible Plant and Services

- 5.1 The plant and services to be supplied under the Contract shall have their origin in eligible source countries as defined in ITB 4.2 and all expenditures under the Contract will be limited to such plant and services.
- 5.2 For purposes of ITB 5.1 above, "origin" means the place where the plant, or component parts thereof are mined, grown, produced, or manufactured, and from which the services are provided. Plant components are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that is substantially in its basic characteristics or in purpose or utility from its components.

B. Contents of Bidding Document

6. Sections of Bidding Document

- 6.1 The Bidding Document consists of Parts I, II, and III, which include all the sections indicated below, and should be read in conjunction with any addenda issued in accordance with ITB 8.

PART I Bidding Procedures

- Section 1 - Instructions to Bidders (ITB)
- Section 2 - Bid Data Sheet (BDS)
- Section 3 - Evaluation and Qualification Criteria (EQC)
- Section 4 - Bidding Forms (BDF)
- Section 5 - Eligible Countries (ELC)

PART II Requirements

- Section 6 - Employer's Requirements (ERQ)

PART III Conditions of Contract and Contract Forms

- Section 7 - General Conditions of Contract (GCC)
- Section 8 - Special Conditions of Contract (SCC)
- Section 9 - Contract Forms (COF)

- 6.2 The Invitation for Bids (IFB) issued by the Employer is not part of the Bidding Document.
- 6.3 The Employer is not responsible for the completeness of the Bidding Document and its addenda, if they were not obtained directly from the source stated by the Employer in the IFB.

- 6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document. Failure to furnish all information or documentation required by the Bidding Document may result in the rejection of the Bid.
- 7. Clarification of Bidding Document, Site Visit, Pre-Bid Meeting**
- 7.1 A prospective Bidder requiring any clarification on the Bidding Document shall contact the Employer in writing at the Employer's address indicated in the BDS, or raise inquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond to any request for clarification, provided that such request is received no later than 21 days prior to the deadline for submission of bids. The Employer's response shall be in writing with copies to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. Should the Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 8 and ITB 24.2.
- 7.2 The Bidder is advised to visit and examine the site where the plant is to be installed and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the Bid and entering into a contract for the provision of plant and services. The costs of visiting the site shall be at the Bidder's own expense.
- 7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents, will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.
- 7.4 The Bidder's designated representative is invited to attend a pre-bid meeting, if provided for in the BDS. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.
- 7.5 The Bidder is requested to submit any questions in writing, to reach the Employer not later than 1 week before the pre-bid meeting.
- 7.6 Minutes of the pre-bid meeting, including the text of the questions raised, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting.
- 7.7 Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.
- 8. Amendment of Bidding Document**
- 8.1 At any time prior to the deadline for submission of Bids, the Employer may amend the Bidding Document by issuing addenda.

- 8.2 Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document from the Employer in accordance with ITB 6.3.
- 8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Employer may, at its discretion, extend the deadline for the submission of Bids, pursuant to ITB 24.2

C. Preparation of Bids

- 9. Cost of Bidding** 9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
- 10. Language of Bid** 10.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Employer, shall be written in the English language. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages into the English language, in which case, for purposes of interpretation of the Bid, such translation shall govern.
- 11. Documents Comprising the Bid** 11.1 The Bid shall comprise two envelopes submitted simultaneously, one containing the Technical Bid and the other the Price Bid, both envelopes enclosed together in an outer single envelope.
- 11.2 The Technical Bid submitted by the Bidder shall comprise the following:
- (a) Letter of Technical Bid;
 - (b) Bid Security or Bid-Securing Declaration, in accordance with ITB 21;
 - (c) alternative Bids, if permissible, in accordance with ITB 13;
 - (d) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 22.2;
 - (e) documentary evidence in accordance with ITB 14.1, that the plant and services offered by the Bidder in its Bid or in any alternative Bid, if permitted, are eligible;
 - (f) documentary evidence in accordance with ITB 15, the Bidder's eligibility and qualifications to perform the contract if its Bid is accepted;
 - (g) Technical Proposal in accordance with ITB 17.
 - (h) documentary evidence in accordance with ITB 16, that the plant and services offered by the Bidder conform to the Bidding Document;
 - (i) in the case of a bid submitted by a Joint Venture, the Bid shall include a copy of the Joint Venture Agreement entered into by all partners. Alternatively, a Letter of Intent to execute a Joint Venture Agreement in the event of a successful bid shall be signed by all partners and submitted with the Bid, together with a copy of the proposed agreement;

- (j) list of subcontractors, in accordance with ITB 17.2; and
 - (k) any other document required in the BDS.
- 11.3 The Price Bid submitted by the Bidder shall comprise the following:
- (a) Letter of Price Bid;
 - (b) completed schedules as required, including Price Schedules, in accordance with ITB 12 and ITB 18;
 - (c) alternative price Bids, if permissible, in accordance with ITB 13; and
 - (d) any other document required in the BDS.
- 12. Letter of Bid and Schedules**
- 12.1 The Letters of Technical Bid and Price Bid, and the Schedules, and all documents listed under ITB 11, shall be prepared using the relevant forms furnished in Section 4 (Bidding Forms). The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested and as required in the BDS.
- 13. Alternative Bids**
- 13.1 The BDS indicates whether alternative Bids are allowed. If they are allowed, the BDS will also indicate whether they are permitted in accordance with ITB 13.3, or invited in accordance with ITB13.2 and/or ITB 13.4.
- 13.2 When alternatives to the Time Schedule are explicitly invited, a statement to that effect will be included in the BDS, and the method of evaluating different time schedules will be described in Section 3 (Evaluation and Qualification Criteria).
- 13.3 Except as provided under ITB 13.4 below, Bidders wishing to offer technical alternatives to the Employer's requirements as described in the Bidding Document must also provide: (i) a price at which they are prepared to offer a plant 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 specifications, breakdown of prices, and proposed installation methodology and other relevant details. Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the Employer.
- 13.4 When Bidders are invited in the BDS to submit alternative technical solutions for specified parts of the facilities, such parts shall be described in Section 6 (Employer's Requirements). Technical alternatives for the specific parts of the facilities that comply with the performance and technical criteria specified for the plant and services shall be considered by the Employer on their own merits, pursuant to ITB 32.
- 14. Documents Establishing the Eligibility of Plant and Services**
- 14.1 To establish the eligibility of the plant and services in accordance with ITB 5, Bidders shall complete the country of origin declarations in the Price Schedule Forms, included in Section 4 (Bidding Forms).

- 15. Documents Establishing the Eligibility and Qualifications of the Bidder**
- 15.1 To establish its eligibility and qualifications to perform the Contract in accordance with Section 3 (Evaluation and Qualification Criteria), the Bidder shall provide the information requested in the corresponding information sheets included in Section 4 (Bidding Forms).
- 15.2 Domestic Bidders, individually or in joint ventures, applying for eligibility for domestic preference shall supply all information required to satisfy the criteria for eligibility as described in ITB 38.
- 16. Documents Establishing Conformity of the Plant and Services**
- 16.1 The documentary evidence of the conformity of the plant and services to the Bidding Document may be in the form of literature, drawings and data, and shall furnish:
- (a) a detailed description of the essential technical and performance characteristics of the plant and services, including the functional guarantees of the proposed plant and services, in response to the Specification;
 - (b) a list giving full particulars, including available sources, of all spare parts and special tools necessary for the proper and continuing functioning of the plant for the period named in the BDS, following completion of plant and services in accordance with provisions of the contract; and
 - (c) a commentary on the Employer's Specifications and adequate evidence demonstrating the substantial responsiveness of the plant and services to those specifications. Bidders shall note that standards for workmanship, materials and equipment designated by the Employer in the Bidding Document are intended to be descriptive (establishing standards of quality and performance) only and not restrictive. The Bidder may substitute alternative standards, brand names and/or catalog numbers in its Bid, provided that it demonstrates to the Employer's satisfaction that the substitutions are substantially equivalent or superior to the standards designated in the Specifications.
- 17. Technical Proposal, Subcontractors**
- 17.1 The Bidder shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Section 4 (Bidding Forms), in sufficient detail to demonstrate the adequacy of the Bidders' proposal to meet the work requirements and the completion time.
- 17.2 For major items of plant and services as listed by the Employer in Criterion 2.5 of Section 3 (Evaluation and Qualification Criteria), which the Bidder intends to purchase or subcontract, the Bidder shall give details of the name and nationality of the proposed Subcontractors, including Manufacturers, for each of those items. In addition, the Bidder shall include in its Bid information establishing compliance with the requirements specified by the Employer for these items. Bidders are free to list more than one Subcontractor against each item of the plant and services. Quoted rates and prices will be deemed to apply to whichever Subcontractor is appointed, and no adjustment of the rates and prices will be permitted.

- 17.3 The Bidder shall be responsible for ensuring that any Subcontractor proposed complies with the requirements of ITB 4, and that any plant, or services to be provided by the Subcontractor comply with the requirements of ITB 5 and ITB 15.1
- 18. Bid Prices and Discounts**
- 18.1 Unless otherwise specified in the BDS and/or Section 6 (Employer's Requirements), bidders shall quote for the entire plant and services on a "single responsibility" basis such that the total Bid price covers all the Contractor's obligations mentioned in or to be reasonably inferred from the Bidding Document in respect of the design, manufacture, including procurement and subcontracting (if any), delivery, construction, installation, and completion of the plant. This includes all requirements under the Contractor's responsibilities for testing, pre-commissioning and commissioning of the plant and, where so required by the Bidding Document, the acquisition of all permits, approvals, and licenses, etc.; the operation, maintenance, and training services and such other items and services as may be specified in the Bidding Document, all in accordance with the requirements of the General Conditions. Items against which no price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed to be covered by the prices for other items.
- 18.2 Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the Bidding Document.
- 18.3 Bidders shall give a breakdown of the prices in the manner and detail called for in the Price Schedules included in Section 4 (Bidding Forms). Where no different Price Schedules are included in the Bidding Document, Bidders shall present their prices in the following manner: Separate numbered Schedules included in Section 4 (Bidding Forms) shall be used for each of the following elements. The total amount from each Schedule (Nos. 1 to 4) shall be summarized in a Grand Summary (Schedule No. 5) giving the total bid price(s) to be entered in the Letter of Price Bid. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the Bid.
- Schedule No. 1: Plant and Mandatory Spare Parts Supplied from Abroad
- Schedule No. 2: Plant and Mandatory Spare Parts Supplied from Within the Employer's Country
- Schedule No. 3: Design Services
- Schedule No. 4: Installation and Other Services
- Schedule No. 5: Grand Summary (Schedule Nos. 1 to 4)
- Schedule No. 6: Recommended Spare Parts
- Bidders shall note that the plant and mandatory spare parts included in Schedule Nos. 1 and 2 above exclude materials used for civil, building, and other construction works. All such materials shall be included and priced under Schedule No. 4, Installation and Other Services.
- 18.4 In the Schedules, Bidders shall give the required details and a breakdown of their prices as follows:

- (a) Plant to be Supplied from Abroad (Schedule No. 1):
 - (i) the price of the plant shall be quoted carriage and insurance paid (CIP)-named place of destination basis specified in the BDS;
 - (ii) all customs duties and other taxes paid or payable in the Employer's country on the plant if the contract is awarded to the Bidder; and
 - (iii) the total price for the plant.
 - (b) Plant Supplied from Within the Employer's Country (Schedule No. 2):
 - (i) the price of the plant shall be quoted on an EXW Incoterm basis (ex works, ex factory, ex warehouse, ex showroom, as applicable), including all customs duties and sales and other taxes already paid or payable on the components and raw material used in the manufacture or assembly of plant quoted ex works or ex factory, or on the previously imported plant of foreign origin quoted ex warehouse, ex showroom;
 - (ii) sales tax and other taxes payable in the Employer's country on the plant if the contract is awarded to the Bidder, and
 - (iii) the total price for the plant.
 - (c) Design Services. (Schedule No. 3). Rates or prices shall include all taxes, duties, levies, and charges payable in the Employer's country as of 28 days prior to the deadline for submission of Bids.
 - (d) Installation and Other Services (Schedule No. 4) shall be quoted separately and shall include rates or prices for local transportation, insurance, and other services incidental to delivery of the plant, all labor, contractor's equipment, temporary works, materials, consumables, and all matters and things of whatsoever nature, including operations and maintenance services, the provision of operations and maintenance manuals, training, etc., where identified in the Bidding Document, as necessary for the proper execution of the installation and other services, including all taxes, duties, levies, and charges payable in the Employer's country as of 28 days prior to the deadline for submission of bids.
 - (e) Recommended spare parts (Schedule No. 6) shall be quoted separately as specified in either subparagraph (a) or (b) above in accordance with the origin of the spare parts.
- 18.5 The current edition of Incoterms, published by the International Chamber of Commerce shall govern.
- 18.6 The prices shall be either fixed or adjustable as specified in the BDS.
- (a) In the case of Fixed Price, prices quoted by the Bidder shall be fixed during the Bidder's performance of the contract and not subject to variation on any account. A Bid submitted with an adjustable price quotation will be treated as nonresponsive and rejected.
 - (b) In the case of Adjustable Price, prices quoted by the Bidder shall be subject to adjustment during performance of the contract to reflect changes in the cost elements such as labor, material, transport, and contractor's equipment in accordance with the procedures specified in the corresponding appendix to the Contract Agreement. A Bid

submitted with a fixed price quotation will not be rejected, but the price adjustment will be treated as zero. Bidders are required to indicate the source of labor and material indexes in the corresponding Form in Section 4 (Bidding Forms).

- 18.7 If so indicated in BDS 1.1, Bids are being invited for individual lots (contracts) or for any combination of lots (packages). Bidders wishing to offer any price reduction (discount) for the award of more than one contract shall specify in their Letter of Price Bid the price reductions applicable to each package, or alternatively, to individual contracts within the package, and the manner in which the price reductions will apply.
- 19. Currencies of Bid and Payment**
- 19.1 The currency(ies) of the bid shall be, as specified in the BDS.
- 19.2 Bidders may be required by the Employer to justify, to the Employer's satisfaction, their local and foreign currency requirements.
- 20. Period of Validity of Bids**
- 20.1 Bids shall remain valid for the period specified in the BDS after the bid submission deadline date prescribed by the Employer. A bid valid for a shorter period shall be rejected by the Employer as nonresponsive.
- 20.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Employer may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 21, it shall also be extended 28 days beyond the deadline of the extended bid validity period. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its Bid.
- 21. Bid Security/ Bid Securing Declaration**
- 21.1 Unless otherwise specified in the BDS, the Bidder shall furnish as part of its Bid, in original form, either a Bid-Securing Declaration or a bid security as specified in the BDS. In the case of a bid security, the amount and currency shall be as specified in the BDS.
- 21.2 If a Bid-Securing Declaration is required pursuant to ITB 21.1, it shall use the form included in Section 4 (Bidding Forms). The Employer will declare a Bidder ineligible to be awarded a Contract for a specified period of time, as indicated in the BDS, if a Bid-Securing Declaration is executed.
- 21.3 If a bid security is specified pursuant to ITB 21.1, the bid security shall be, at the Bidder's option, in any of the following forms:
- (a) an unconditional bank guarantee,
 - (b) an irrevocable letter of credit, or
 - (c) a cashier's or certified check,
- all from a reputable source from an eligible country as described in Section 5 (Eligible Countries). In the case of a bank guarantee, the bid security shall be submitted using either the Bid Security Form included in Section 4 (Bidding Forms) or another form acceptable to the Employer. The form must include the complete name of the Bidder. The bid security shall be valid for 28 days beyond the original validity period of the Bid, or beyond

any period of extension if requested under ITB 20.2.

- 21.4 Unless otherwise specified in the BDS, any Bid not accompanied by a substantially compliant bid security or Bid-Securing Declaration, if one is required in accordance with ITB 21.1, shall be rejected by the Employer as nonresponsive.
- 21.5 If a bid security is specified pursuant to ITB 21.1, the bid security of the unsuccessful Bidder shall be returned as promptly as possible upon the successful Bidder's furnishing of the performance security pursuant to ITB 45.
- 21.6 If a bid security is specified pursuant to ITB 21.1, the bid security of successful Bidders shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security.
- 21.7 The bid security may be forfeited or the Bid-Securing Declaration executed:
- (a) if a Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Letters of Technical Bid and Price Bid, except as provided in ITB 20.2 or
 - (b) if the successful Bidder fails to:
 - (i) sign the Contract in accordance with ITB 44;
 - (ii) furnish a performance security in accordance with ITB 45; or
 - (iii) accept the arithmetical corrections of its Bid in accordance with ITB 36.
- 21.8 The bid security or the Bid-Securing Declaration of a Joint Venture shall be in the name of the Joint Venture that submits the Bid. If the Joint Venture has not been legally constituted at the time of bidding, the bid security or the Bid-Securing Declaration shall be in the names of all future partners as named in the letter of intent referred to in ITB 4.1.

22. Format and Signing of Bid

- 22.1 The Bidder shall prepare one original set of the Technical Bid and one original set of the Price Bid comprising the Bid as described in ITB 11 and clearly mark it "ORIGINAL - TECHNICAL BID" and "ORIGINAL - PRICE BID". Alternative bids, if permitted in accordance with ITB 13, shall be clearly marked "ALTERNATIVE". In addition, the Bidder shall submit copies of the Bid, in the number specified in the BDS and clearly mark each of them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.
- 22.2 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the bid, except for unamended printed literature, shall be signed or initialed by the person signing the Bid. If a Bidder submits a deficient authorization, the Bid shall not be rejected in the first instance. The Employer shall request the Bidder to submit an acceptable

authorization within the number of days as specified in the BDS. Failure to provide an acceptable authorization within the prescribed period of receiving such a request shall cause the rejection of the Bid.

- 22.3 A Bid submitted by a Joint Venture shall be signed so as to be legally binding on all partners.
- 22.4 Any amendments such as interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Bid.

D. Submission and Opening of Bids

23. Submission, Sealing, and Marking of Bids

- 23.1 Bidders may submit their Bids by mail or by hand. When so specified in the BDS, Bidders shall have the option of submitting their Bids electronically. Procedures for submission, sealing and marking are as follows:
- (a) Bidders submitting Bids by mail or by hand shall enclose the original and each copy of the Bid, including alternative Bids, if permitted in accordance with ITB 13, in separate sealed envelopes, duly marking the envelopes as "ORIGINAL," "ALTERNATIVE," and "COPY." These envelopes containing the original and the copies shall then be enclosed in one single envelope. The rest of the procedure shall be in accordance with ITB 23.2 to ITB 23.6.
 - (b) Bidders submitting Bids electronically shall follow the electronic bid submission procedures specified in the BDS.
- 23.2 The inner and outer envelopes shall
- (a) bear the name and address of the Bidder,
 - (b) be addressed to the Employer in accordance with ITB 24.1, and
 - (c) bear the specific identification of this bidding process indicated in the BDS 1.1.
- 23.3 The outer envelopes and the inner envelopes containing the Technical Bid shall bear a warning not to open before the time and date for the opening of Technical Bid, in accordance with ITB 27.1.
- 23.4 The inner envelopes containing the Price Bid shall bear a warning not to open until advised by the Employer in accordance with ITB 27.7.
- 23.5 Alternative Bids, if permissible in accordance with ITB 13, shall be prepared, sealed, marked, and delivered in accordance with the provisions of ITB 20 and ITB 21, with the inner envelopes marked in addition "ALTERNATIVE NO...." as appropriate.
- 23.6 If all envelopes are not sealed and marked as required, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.

24. Deadline for Submission of Bids

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

- 24.2 The Employer may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Document in accordance with ITB 8, in which case all rights and obligations of the Employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.
- 25. Late Bids**
- 25.1 The Employer shall not consider any Bid that arrives after the deadline for submission of Bids, in accordance with ITB 24. Any Bid received by the Employer after the deadline for submission of Bids shall be declared late, rejected, and returned unopened to the Bidder.
- 26. Withdrawal, Substitution, and Modification of Bids**
- 26.1 A Bidder may withdraw, substitute, or modify its Bid after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 22.2, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the Bid must accompany the respective written notice. All notices must be:
- (a) prepared and submitted in accordance with ITB 22 and ITB 23 (except that withdrawal notices do not require copies), and in addition, the respective envelopes shall be clearly marked "Withdrawal," "Substitution," "Modification;" and
 - (b) received by the Employer prior to the deadline prescribed for submission of Bids, in accordance with ITB 24.
- 26.2 Bids requested to be withdrawn in accordance with ITB 26.1 shall be returned unopened to the Bidders.
- 26.3 No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of Bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Technical Bid or any extension thereof.
- 27. Bid Opening**
- 27.1 The Employer shall open the Technical Bids in public at the address, on the date, and time specified in the BDS in the presence of Bidder's designated representatives and anyone who choose to attend. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with ITB 23.1, shall be as specified in the BDS. The Price Bids will remain unopened and will be held in custody of the Employer until the specified time of their opening. If the Technical Bid and the Price Bid are submitted together in one envelope, the Employer may reject the entire Bid. Alternatively, the Price Bid may be immediately resealed for later evaluation.
- 27.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding Bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening.
- 27.3 Second, outer envelopes marked "SUBSTITUTION" shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened, read out, and recorded. Substitution Price Bid will remain unopened in accordance with ITB 27.1. No envelope shall be substituted unless the corresponding

Substitution Notice contains a valid authorization to request the substitution and is read out and recorded at bid opening.

27.4 Next, outer envelopes marked "MODIFICATION" shall be opened. No Technical Bid and/or Price Bid shall be modified unless the corresponding Modification Notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification, are to be opened, read out, and recorded at the opening. Price Bids, both Original as well as Modification, will remain unopened in accordance with ITB 27.1.

27.5 All other envelopes holding the Technical Bids shall be opened one at a time, and the following read out and recorded:

- (a) the name of the Bidder;
- (b) whether there is a modification or substitution;
- (c) the presence of a bid security or a Bid-Securing Declaration, if required; and
- (d) any other details as the Employer may consider appropriate.

Only Technical Bids and alternative Technical Bids read out and recorded at bid opening shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Letter of Technical Bid are to be initialed by at least three representatives of the Employer attending the bid opening. No Bid shall be rejected at the opening of Technical Bids except for late Bids, in accordance with ITB 25.1.

27.6 The Employer shall prepare a record of the opening of Technical Bids that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification; and alternative Bids; and the presence or absence of a bid security or a Bid-Securing Declaration, if one was required. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted Bids on time, and posted online when electronic bidding is permitted.

27.7 At the end of the evaluation of the Technical Bids, the Employer will invite bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified for award to attend the opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Employer. Bidders shall be given reasonable notice of the opening of Price Bids.

27.8 The Employer will notify Bidders in writing who have been rejected on the grounds of their Technical Bids being substantially nonresponsive to the requirements of the Bidding Document and return their Price Bids unopened.

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

27.10 All envelopes containing Price Bids shall be opened one at a time and the

following read out and recorded:

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

Only Price Bids, discounts, and alternative offers read out and recorded during the opening of Price Bids shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Letter of Price Bid and Price Schedules are to be initialed by at least three representatives of the Employer attending bid the opening. No Bid shall be rejected at the opening of Price Bids.

- 27.11 The Employer shall prepare a record of the opening of Price Bids that shall include, as a minimum: the name of the Bidder, the Bid Price (per lot if applicable), any discounts, and alternative offers. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted Bids on time, and posted online when electronic bidding is permitted.

E. Evaluation and Comparison of Bids

- 28. Confidentiality**
- 28.1 Information relating to the evaluation of Bids and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until information on the Contract award is communicated to all Bidders.
- 28.2 Any attempt by a Bidder to influence the Employer in the evaluation of the Bids or Contract award decisions may result in the rejection of its Bid.
- 28.3 Notwithstanding ITB 28.2, from the time of bid opening to the time of Contract award, if any Bidder wishes to contact the Employer on any matter related to the bidding process, it should do so in writing.
- 29. Clarification of Bids**
- 29.1 To assist in the examination, evaluation, and comparison of the Technical and Price Bids, and qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change in the substance of the Technical Bid or prices in the Price Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids, in accordance with ITB 36.
- 29.2 If a Bidder does not provide clarifications of its Bid by the date and time set in the Employer's request for clarification, its Bid may be rejected.
- 30. Deviations, Reservations, and Omissions**
- 30.1 During the evaluation of Bids, the following definitions apply:
- (a) "Deviation" is a departure from the requirements specified in the Bidding Document;

- (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and
- (c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Document.
- 31. Examination of Technical Bids**
- 31.1 The Employer shall examine the Technical Bid to confirm that all documents and technical documentation requested in ITB 11.2 have been provided, and to determine the completeness of each document submitted. If any of these documents or information is missing, the Bid may be rejected.
- 31.2 The Employer shall confirm that the following documents and information have been provided in the Technical Bid. If any of these documents or information is missing, the offer shall be rejected.
- (a) Letter of Technical Bid;
- (b) written confirmation of authorization to commit the Bidder;
- (c) Bid Security or Bid-Securing Declaration, if applicable; and
- (d) Technical Proposal in accordance with ITB 17.
- 32. Responsiveness of Technical Bid**
- 32.1 The Employer's determination of a bid's responsiveness is to be based on the contents of the Bid itself, as defined in ITB11.
- 32.2 A substantially responsive Technical Bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that,
- (a) if accepted, would:
- (i) affect in any substantial way the scope, quality, or performance of the plant and services specified in the Contract; or
- (ii) limit in any substantial way, inconsistent with the Bidding Document, the Employer's rights or the Bidder's obligations under the proposed Contract; or
- (b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids.
- 32.3 The Employer shall examine the technical aspects of the Bid submitted in accordance with ITB 17, Technical Proposal, in particular to confirm that all requirements of Section 6 (Employer's Requirements) have been met without any material deviation, reservation, or omission.
- 32.4 If a Bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.
- 33. Nonmaterial Nonconformities**
- 33.1 Provided that a Bid is substantially responsive, the Employer may waive any nonconformities in the Bid that do not constitute a material deviation, reservation, or omission.

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

33.3 Provided that a Bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component. The adjustment shall be made using the method indicated in Section 3 (Evaluation and Qualification Criteria).

34. Detailed Evaluation of Technical Bids

34.1 The Employer will carry out a detailed technical evaluation of the Bids not previously rejected as being substantially nonresponsive, to determine whether the technical aspects are in compliance with the Bidding Document. The Bid that does not meet minimum acceptable standards of completeness, consistency, and detail, and the specified minimum and/or maximum requirements for specified functional guarantees, will be treated as nonresponsive and hence rejected. To reach such a determination, the Employer will examine and compare the technical aspects of the bids on the basis of the information supplied by the Bidders, taking into account the following:

- (a) overall completeness and compliance with the Employer's Requirements; deviations from the Employer's Requirements; conformity of the plant and services offered with specified performance criteria; suitability of the plant and services offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of any process control concept included in the Bid. The Bid that does not meet minimum and/or maximum acceptable standards of completeness, consistency, and detail will be rejected for non-responsiveness;
- (b) type, quantity, and long-term availability of mandatory and recommended spare parts and maintenance services; and
- (c) other relevant factors, if any, listed in Section 3 (Evaluation and Qualification Criteria).

34.2 Where alternative technical solutions have been allowed in accordance with ITB 13, and offered by the Bidder, the Employer will make a similar evaluation of the alternatives. Where alternatives have not been allowed but have been offered, they shall be ignored.

35. Eligibility and Qualification of the Bidder

35.1 The Employer shall determine to its satisfaction during the evaluation of Technical Bids whether a Bidder meets the eligibility and qualifying criteria specified in Section 3 (Evaluation and Qualification Criteria).

35.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 15.

- 35.3 An affirmative determination shall be a prerequisite for the opening and evaluation of a Bidder's Price Bid. A negative determination shall result into the disqualification of the Bid, in which event the Employer shall return the unopened Price Bid to the Bidder.
- 35.4 The capabilities of the manufacturers and subcontractors proposed in its Bid for the major items of plant and services to be used by the lowest evaluated Bidder will also be evaluated for acceptability in accordance with Section 3 (Evaluation and Qualification Criteria). Their participation should be confirmed with a letter of intent between the parties, as needed. Should a manufacturer or subcontractor be determined to be unacceptable, the Bid will not be rejected, but the Bidder will be required to propose, without changing its bid price, an acceptable substitute manufacturer or subcontractor meeting the minimum technical specifications stated in Section 6 (Employer's Requirements). If a Bidder does not provide an acceptable substitute manufacturer or subcontractor by the date and time set in the Employer's request for substitution of manufacturer or subcontractor, its Bid may be rejected.
- 35.5 Prior to signing the Contract, the corresponding Appendix to the Contract Agreement shall be completed, listing the approved manufacturers or subcontractors for each item concerned.
- 36. Correction of Arithmetical Errors**
- 36.1 During the evaluation of Price Bids, the Employer shall correct arithmetical errors on the following basis:
- (a) where there are errors between the total of the amounts given under the column for the price breakdown and the amount given under the Total Price, the amounts given under the column for the price breakdown shall prevail and the Total Price will be corrected accordingly;
 - (b) where there are errors between the total of the amounts of Schedule Nos. 1 to 4 and the amount given in Schedule No. 5 (Grand Summary), the total of the amounts of Schedule Nos. 1 to 4 shall prevail and the Schedule No. 5 (Grand Summary) will be corrected accordingly;
 - (c) if there is a discrepancy between the grand total price given in Schedule No. 5 (Grand Summary) and the bid amount in item (c) of the Letter of Price Bid, the grand total price given in Schedule No. 5 (Grand Summary) will prevail and the bid amount in item (c) of the Letter of Price Bid will be corrected; and
 - (d) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetical error, in which case the amount in figures shall prevail subject to (a), (b), and (c) above.
- 36.2 If the Bidder that submitted the lowest evaluated Bid does not accept the correction of errors, its Bid shall be disqualified and its bid security may be forfeited or its Bid-Securing Declaration executed.
- 37. Conversion to Single Currency**
- 37.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency as specified in the BDS .

- 38. Margin of Preference** 38.1 Unless otherwise specified in the BDS, a margin of preference shall not apply.
- 39. Evaluation of Price Bids** 39.1 The Employer shall use the criteria and methodologies listed in this clause. No other evaluation criteria or methodologies shall be permitted.
- 39.2 I. To evaluate a Price Bid, the Employer shall consider the following:
- (a) the bid price, excluding provisional sums and the provision, if any, for contingencies in the Price Schedules;
 - (b) price adjustment for correction of arithmetical errors in accordance with ITB 36.1;
 - (c) price adjustment due to discounts offered in accordance with ITB 18.7;
 - (d) price adjustment due to quantifiable nonmaterial nonconformities in accordance with ITB 33.3;
 - (e) converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITB 37; and
 - (f) the evaluation factors indicated in Section 3 (Evaluation and Qualification Criteria).
- II. The Employer's evaluation of a Bid will exclude and not take into account,
- (a) in the case of Plant and Mandatory Spare Parts (Schedule No. 1) supplied from abroad, all taxes and duties, applicable in the Employer's country and payable on the Plant and Mandatory Spare Parts if the Contract is awarded to the Bidder; and
 - (b) in the case of Plant and Mandatory Spare Parts (Schedule No. 2) supplied from within the Employer's country, sales and other taxes, applicable in the Employer's country and payable on the Plant and Mandatory Spare Parts if the Contract is awarded to the Bidder.
- 39.3 If price adjustment is allowed in accordance with ITB 18.6, the estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.
- 39.4 If this Bidding Document allows Bidders to quote separate prices for different lots (contracts), and the award to a single Bidder of multiple lots (contracts), the methodology to determine the lowest evaluated price of the lot (contract) combinations, including any discounts offered in the Letter of Price Bid, is specified in Section 3 (Evaluation and Qualification Criteria).
- 39.5 If the Bid, which results in the lowest Evaluated Bid Price, is seriously unbalanced or front loaded in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Price Schedules, to demonstrate the internal consistency of those prices with the methods and time schedule proposed. After evaluation of the price analyses, taking into consideration the terms of payments, the Employer may require that the amount of the performance security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.
- 40. Comparison of Bids** 40.1 The Employer shall compare all substantially responsive Bids to determine the lowest evaluated Bid, in accordance with ITB 39.2.

- 41. Employer's Right to Accept Any Bid, and to Reject Any or All Bids** 41.1 The Employer reserves the right to accept or reject any Bid, and to annul the bidding process and reject all Bids at any time prior to contract award, without thereby incurring any liability to Bidders. In case of annulment, all Bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.

F. Award of Contract

- 42. Award Criteria** 42.1 The Employer shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated Bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be eligible and qualified to perform the Contract satisfactorily.
- 43. Notification of Award** 43.1 Prior to the expiration of the period of bid validity, the Employer shall notify the successful Bidder, in writing, that its Bid has been accepted.
- 43.2 At the same time, the Employer shall also notify all other Bidders of the results of the bidding. The Employer will publish in an English language newspaper or well-known freely accessible website the results identifying the Bid and lot numbers, and the following information: (i) name of each Bidder who submitted a bid; (ii) bid prices as read out at bid opening; (iii) name and evaluated prices of each bid that was evaluated; (iv) name of Bidders whose Bids were rejected and the reasons for their rejection; and (v) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded. After publication of award, unsuccessful Bidders may request in writing to the Employer for a debriefing seeking explanations on the grounds on which their Bids were not selected. The Employer shall promptly respond in writing to any unsuccessful Bidder who, after publication of contract award, request for a debriefing.
- 43.3 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.
- 44. Signing of Contract** 44.1 Promptly after notification, the Employer shall send the successful Bidder the Contract Agreement.
- 44.2 Within 28 days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.
- 45. Performance Security** 45.1 Within 28 days of the receipt of notification of award from the Employer, the successful Bidder shall furnish the performance security in accordance with the conditions of contract, subject to ITB 39.5, using for that purpose the Performance Security Form included in Section 9 (Contract Forms), or another form acceptable to the Employer.
- 45.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security or execution of the Bid-Securing Declaration. In that event, the Employer may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.

Section 2 - Bid Data Sheet

This section consists of provisions that are specific to each procurement and supplement or amend the information or requirements included in Section 1 - Instructions to Bidders.

A. General

ITB 1.1	<p>The number of the Invitation for Bids (IFB) is :</p> <p>PEIC/JKWSSP/SEA WATER REVERSE OSMOSIS PLANT/2015/01</p> <p>The Employer is: National Water Supply and Drainage Board</p> <p>The name of the international competitive bidding (ICB) is:</p> <p>Design, Build and Operate (DBO) of a 24 MLD Sea Water Reverse Osmosis (SWRO) Desalination Plant at Thalaiyadi, Jaffna District, Sri Lanka</p> <p>The identification number of the ICB is:</p> <p>PEIC/JKWSSP/SEA WATER REVERSE OSMOSIS PLANT/2015/01</p> <p>The number and identification of lots (contracts) comprising this ICB is: Nil</p>
ITB 1.3	<p>Adding the following additional clause Bidders shall note that references to “plant and services” in this bidding document covers the entirety of the Contractor’s scope for the Design-Build of the Works, the Operation Service and asset replacement.</p>
ITB 2.1	<p>The Borrower is: The Democratic Socialist Republic of Sri Lanka</p> <p>The name of the Project is:</p> <p>Jaffna Kilinochchi Water Supply and Sanitation Project - Additional Financing Loan Number: 37378-SRI</p>
ITB 3.2	<p>Clause shall be replaced as below. Furthermore, Bidders shall be aware of the provisions stated in the General Conditions of Contract Sub-Clause 15.2 (g) and Particular Conditions of Contract, Part B Sub-Clause 1.16</p>

B. Contents of Bidding Documents

ITB 6.1	<p>Section 8 – Special Conditions of Contract (SCC) shall be replaced as Section 8 – Particular Conditions of Contract (PCC).</p>
ITB 6.1	<p>For clarity Section 4 Bidding Forms (BDF) was subdivided into:</p> <ul style="list-style-type: none"> • Section 4A BDF - Volume 1 (TECHNICAL BID); and, • Section 4B BDF - Volume 2 (PRICE BID).
ITB 7.1	<p>For clarification purposes only, the Employer’s address is:</p> <p>Attention: Assistant General Manager (Tenders and Contracts) National Water Supply and Drainage Board,</p>

	<p>Galle Road, Ratmalana, Sri Lanka Tel: +94112605328Ext 1750 Fax: +94 11 2635885 Email: agmtenders@waterboard.lk</p>
ITB 7.4	<p>For clarifications purposes the Bidder shall request EA in writing to arrange the site visit before Pre Bid meeting.</p> <p>A Pre-Bid meeting would be held commencing at 9.30 a.m. on 16th February 2017, at the address given below.</p> <p>Address:</p> <p>RSC (Western South) Office National Water Supply and Drainage Board No. 7, Angulana Station Road Angulana, Moratuwa</p>
ITB 7.6	<p>Minutes of the meeting, including the text of the questions raised (without identifying the source of enquiry) and the responses will be given within two weeks from the Pre – Bid meeting.</p>

C. Preparation of Bids

ITB 11.2 (k)	<p>The Bidder shall submit with its Technical Bid the following additional documents:</p> <ul style="list-style-type: none"> • A written authority to seek references from the bidder's bankers. • If any person who acts as an agent or sub-agent, representative or nominee for or on behalf of any bidder, a Certificate or Registration issued by the Registrar of Public Contracts in Sri Lanka, in accordance with Public Contracts Act No. 3 of 1987 of the Government of Sri Lanka and any subsequent gazette notification. • If the bidder is a joint Venture, a certified/attested copy of JV agreement or the Memorandum of Understanding and if the bidder is Limited Liability company, a certified/attested copy of the Certificate of Incorporation and if the bidder is partnership, a certified/attested copy of the Partnership Agreement. • All details and information requested in the Employer's Requirements stipulated to be submitted with the bid • Manufacturer's Authorization (-s). • A letter from a reputable professional insurance company indicating that they will be able to provide the necessary insurances specified in the GCC and PCC. • Statements disclosing termination/failure to complete; claims, arbitration and litigation from Bidder/Parties to the Bidder. <p>For the purposes of this ITB Clause 11.2, a Key DBO Team Member is any of the following;</p> <p>i) The Bidder, if the Bidder is bidding as a single entity; and,</p>
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	<p>ii) any partner of the Bidder's Joint Venture in the case that the Bidder is bidding as a Joint Venture;</p> <p>All Key DBO Team Members shall individually disclose the following information related to their past performance and legal standing:</p> <ol style="list-style-type: none"> 1) Any bid, performance or payment bond called or a surety company required to finish work, on any project by any of the Key DBO Team Members on or after January 1, 2004. 2) Construction or design claims or litigation with alleged damages totaling more than one hundred thousand dollars (US\$100,000) against any of the key DBO Team Members on or after January 1, 2004. 3) Conviction of any member of the Key DBO Team Members of submitting a false or fraudulent claim to a public agency on or after January 1, 2004. 4) Violations of environmental laws or environmental compliance conditions resulting in issuance of fines, or other penalties over US\$20,000 or other action on or after January 1, 2004. <p>Please note that occurrence of any of the events described above and/or failure to disclose such events may result in the disqualification of the Bidder.</p>
ITB 12.1	The units and rates in figures entered into the Price Schedules should be typewritten or if written by hand, must be in print form. Price Schedules not presented accordingly may be considered nonresponsive.
ITB 13.1	Alternative bids are not permitted.
ITB 13.2	Alternatives to the Time Schedule that exceeds the given schedule shall not be permitted.
ITB 13.3	"Plant" mentioned in 4 th Line shall be replaced as "Plant and Services".
ITB 13.4	"Facilities" mentioned in 2 nd and 4 th lines shall be replaced as "Works".
ITB 15.1	Supportive documents shall be provided for each information provided in Section 4 - Forms. All supportive documents shall be in English language.
ITB 16.1 (b)	<p>Clause shall be replaced as below;</p> <p>A list giving full particulars, including available sources, of all spare parts and special tools necessary for the proper and continuing functioning of the Works for the period named in the BDS, following completion of design-build period in accordance with provisions of the contract; and</p>
ITB 16.1 (b)	The period following commissioning of the Works in accordance with provisions of the contract shall be 7 years .
ITB 18.1	"Plant" mentioned in 9 th line shall be replaced as "Plant and Services".

ITB 18.1	Bidders shall quote for the entire plant and services on a “single responsibility” basis such that the total Bid price covers all the Contractor’s obligations mentioned in or to be reasonably inferred from the Bidding Document in respect of the design, manufacture, including procurement and subcontracting (if any), delivery, construction, installation, testing, completion and operation of the Works.
ITB 18.3	<p>This clause shall be replaced as</p> <p>Bidders shall give a breakdown of the prices in the manner and detail called for in the Price Schedules included in Section 4 (Bidding Forms). Where no different Price Schedules are included in the Bidding Document, Bidders shall present their prices in the following manner: Separate numbered Schedules included in Section 4 (Bidding Forms) shall be used for each of the following elements. The total amount from each Schedule (Nos. 1 to 6) shall be summarized in a Grand Summary (Schedule No. 7) giving the total bid price(s) to be entered in the Letter of Price Bid. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the Bid.</p> <p style="padding-left: 40px;">Schedule No. 1: Plant and Mandatory Spare Parts Supplied from Abroad</p> <p style="padding-left: 40px;">Schedule No. 2: Plant and Mandatory Spare Parts Supplied from Within the Employer’s Country</p> <p style="padding-left: 40px;">Schedule No. 3: Design Service</p> <p style="padding-left: 40px;">Schedule No. 4: Build Service</p> <p style="padding-left: 40px;">Schedule No. 5: Operation Service</p> <p style="padding-left: 40px;">Schedule No. 6: Asset Replacement Fund and Schedule</p> <p style="padding-left: 40px;">Schedule No. 7: Grand Summary (Schedule Nos. 1 to 6)</p> <p>Bidders shall note that the plant and mandatory spare parts included in Schedule Nos. 1 and 2 above exclude materials used for civil, building, and other construction works. All such materials shall be included and priced under Schedule No. 4, Build service.</p>
ITB 18.4(a)(i)	<p>The Incoterm for quoting plant to be supplied from abroad is:</p> <p>CIP Thalaiyadi INCOTERMS 2010 for all items for the Intake & Sea outfall System and Treatment plant and Treated Water Transmission Main from Thalaiyadi to Palai.</p>
ITB 18.4(a)(ii)	Bidders shall note that the Particular Conditions of Contract (PCC 14.1) provides that the Employer would pay the actual customs duties and other taxes including VAT payable on the importable items in Price Schedule 1.
ITB 18.4(b)(i)	<p>The Incoterm for quoting plant manufactured within the Employer’s country is:</p> <p>EXW</p>
ITB 18.4(b)(ii)	Bidders shall note that the Particular Conditions of Contract (PCC 14.1) provides that the Employer would pay the taxes including VAT payable on the items in Price Schedule 2.

ITB 18.4 (c)	<p>This clause shall be replaced as;</p> <p>The rates and prices quoted in Schedule No. 3: Design Services shall exclude VAT. The Particular Conditions of Contract provides (PCC 14.1) that VAT is payable on the Design Services and therefore VAT would be added to the Contractor's invoices at the time of payment.</p>
ITB 18.4(d)	<p>This clause shall be replaced as;</p> <p>Build Service (Schedule No. 4) shall be quoted separately and shall include rates or prices for local transportation, insurance, and other services incidental to delivery of the plant, all labor, contractor's equipment, temporary works, materials, consumables, and all matters and things of whatsoever nature, the provision of operations and maintenance manuals, training, etc., where identified in the Bidding Document, as necessary for the proper execution of the Build Service.</p> <p>The rates and prices quoted in Price Schedule 4 shall exclude VAT. The Particular Conditions of Contract provides (PCC 14.1) that VAT is payable on the Build Service fees and therefore VAT would be added the Contractor's invoices at the time of payment.</p>
ITB 18.4(e)	<p>This clause shall be replaced as;</p> <p>Operation Service (Schedule 5). Operation service shall be quoted separately. The rates and prices quoted in Price Schedule 5 shall exclude VAT. The Particular Conditions of Contract provides (PCC 14.1) that VAT is payable on the Operation Service fees and therefore VAT would be added the Contractor's invoices at the time of payment.</p> <p>Asset Replacement Fund and Schedule (Schedule 6). Asset Replacement Fund shall be quoted separately. Bidders shall note that the Particular Conditions of Contract (PCC 14.1) provides that the Employer would pay the actual customs duties and other taxes including VAT payable on the importable items in Price Schedule 6.</p> <p>The Incoterm for quoting Assets (listed under Schedule 6) to be supplied from abroad is:</p> <p>CIP Thalaiyadi INCOTERMS 2010 for all items for the Intake & Sea outfall System and Treatment plant.</p>
ITB 18.6	<p>The prices quoted by the Bidder shall be adjustable only in respect of Price Schedules 5 and 6.</p>
ITB 19.1	<p>The currencies of the Bid shall be as follows:</p> <ul style="list-style-type: none"> (a) The prices shall be quoted either in the currency of the Employer's country, or in any fully convertible currency of up to three foreign currencies. (b) A Bidder expecting to incur a portion of its expenditures in the performance of the Contract in more than one currency, and wishing to be paid accordingly, shall so indicate in the Schedule of Prices and the Letter of Price Bid. (c) If some of the contract expenditures related to the contract are to be incurred in the Employer's country, such expenditures shall be quoted in either foreign and/or local currency, depending upon the currency in which the costs are to be

	<p>incurred. The Custom Duties, VAT and Taxes shall be quoted in local currency.</p> <p>(d) Bidders may be required by the Employer to clarify their local and foreign currency requirements, and to substantiate that the amounts included in the Price Schedules are reasonable and responsive to ITB 18.1 in which case a detailed breakdown of its foreign currency requirements shall be provided by the Bidder.</p> <p>(e) During the performance of the contract, the foreign currency portions of the outstanding balance of the Contract Price may be adjusted by agreement between the Employer and the Contractor to reflect any changes in foreign currency requirements for the contract. Any such adjustment shall be effected by comparing the amounts quoted in the bid with the amounts already used in the Facilities and the Contractor's future needs for imported items.</p>
ITB 20.1	The bid validity period shall be 270 days.
ITB 21.1	<p>Only a bid security is required. No Bid Securing Declaration is required.</p> <p>The Bidder shall furnish a bank guarantee as bid security for a sum of United States Dollars One million only or an equivalent amount in other freely exchangeable currency at the selling rate prevailed 28 days prior to the deadline date of submission of bids, published by the Central Bank of Sri Lanka; in the format given in Section 4 and valid for a period of 298 days from the deadline or any extended deadline (pursuant to ITB 24.2) for submission of bids.</p> <p>If the guarantee is to be issued by a bank outside Sri Lanka, it shall be from a bank that has a correspondent bank in Sri Lanka. Banks in Sri Lanka issuing the bank guarantee shall be a licensed commercial bank under the Banking Act No.30 of 1988 and supervised by the Central Bank of Sri Lanka. The bid security shall be enforceable in Sri Lanka.</p>
ITB 22.1	<p>In addition to the original Bid, the number of copies is: Five</p> <p>At the end of Sub Clause 22.1, add:</p> <p>The CD of Technical Proposal in Word and PDF format shall be enclosed in the envelope containing the ORIGINAL - TECHNICAL BID.</p> <p>The CD of Price Proposal in Excel and PDF format shall be enclosed in the envelope containing the ORIGINAL - PRICE BID.</p>
ITB 22.2	<p>The written confirmation of authorization to sign on behalf of the Bidder shall consist of:</p> <p>Bids submitted by a limited liability company or a corporation: a Power of Attorney (either notarized or attested by an appropriate authority in the Bidder's home country), or a Board Resolution (certified by the Company Secretary)</p> <p>Bids submitted by a partnership: Power of Attorney shall be either notarized or attested by an appropriate authority in the Bidder's home country.</p> <p>Bids submitted by a Single Proprietor: Power of Attorney shall be required only if the bid is signed by (i) person other than the single proprietor who is the bidder; or (ii) a person other than the owner of a Single Proprietorship who is the bidder.</p> <p>Bids submitted by a Joint Venture: Power of Attorney (either notarized or attested by an appropriate authority in the Bidder's home country). It shall include an undertaking signed by all parties (i) stating that all parties shall be jointly and severally liable, and (ii) nominating a representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the JV during the bidding process, and</p>

	in the event the JV is awarded the contract, during contract execution.
ITB 22.2	The Bidder shall submit an acceptable authorization with the Technical Bid.
ITB 22.2	The Bidder shall submit an acceptable authorization within Seven (7) days.

D. Submission and Opening of Bids

ITB 23.1	Bidders shall not have the option of submitting their bids electronically.
ITB 23.1 (b)	If Bidders shall have the option of submitting their bids electronically, the electronic bidding submission procedures shall be: Not applicable.
ITB 24.1	<p>For <u>bid submission purposes</u> only, the Employer's address is</p> <p>Attention: Chairman Standing Cabinet Appointed Procuring Committee (SCAPC) Procurement Division Ministry of City Planning and Water Supply, "Lakdiya Medura", No.35, New Parliament Road, Pelawatta, Battaramulla, Sri Lanka.</p> <p>The deadline for bid submission is Date: 17th July 2017 Time: 10.00 AM (Sri Lankan Time)</p>
ITB 27.1	<p>The bid opening of Technical Bids shall take place immediately after the above deadline for submission of bids at:</p> <p>Procurement Division Ministry of City Planning and Water Supply, "Lakdiya Medura", No.35, New Parliament Road, Pelawatta, Battaramulla, Sri Lanka. Telephone: +94 11 2177226 Facsimile number: +94 11 4645038</p>
ITB 27.1	Electronic bid opening procedure shall be as follows: Not Applicable
ITB 27.5	The Letter of Technical Bid shall be initialed by three representatives of the Employer attending Technical Bid opening.
ITB 27.10	The Letter of Price Bid and Price Schedules shall be initialed by three representatives of the Employer attending the Price Bid opening.
ITB 29.1	The clause below shall supersede ITB 29.1:

	<p>“Among Bidders who submitted Technical Bids that are found to be generally responsive to the minimum operating and performance requirements as laid out, if any, in Section 6 (Employer’s Requirements), the Employer may conduct clarification meetings with each or any Bidder. The clarification meetings shall clarify any aspects of a Bidder’s Technical Bid that require explanation. No change in the substance of the Technical Bid or prices in the Price Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids, in accordance with ITB 36.</p>
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E. Evaluation and Comparison of Bids

ITB 34.1(b)	<p>This clause shall be replaced as follows</p> <p>type, quantity, and long-term availability of mandatory spare parts and maintenance services; and</p>
36.1 (b)	<p>This clause shall be replaced as follows;</p> <p>where there are errors between the total of the amounts of Schedule Nos. 1 to 6 and the amount given in Schedule No. 7 (Grand Summary), the total of the amounts of Schedule Nos. 1 to 6 shall prevail and the Schedule No. 7 (Grand Summary) will be corrected accordingly.</p>
36.1 (c)	<p>This clause shall be replaced as follows;</p> <p>if there is a discrepancy between the grand total price given in Schedule No. 7 (Grand Summary) and the bid amount in item (c) of the Letter of Price Bid, the grand total price given in Schedule No. 7 (Grand Summary) will prevail and the bid amount in item (c) of the Letter of Price Bid will be corrected.; and</p>
ITB 37.1	<p>The currency that shall be used for bid evaluation and comparison purposes to convert all bid prices expressed in various currencies into a single currency is: Sri Lankan Rupees</p> <p>The source of exchange rate shall be: Central Bank of Sri Lanka</p> <p>The date for the exchange rate shall be: 28 days prior to the deadline for submission of bids.</p>
ITB 38.1	<p>A margin of preference shall not apply.</p>

F. Award of Contract

ITB 44.3	<p>Additional Sub-Clause:</p> <p>If the successful bidder is a joint Venture the Bidder shall submit the Registered Joint Venture Agreement as a Joint Venture Company incorporation.</p>
ITB 45.1	<p>Delete the last wordings ““or another form acceptable to the Employer””.</p>

Section 3 - Evaluation and Qualification Criteria

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1. Evaluation

1.1 Technical Evaluation

In addition to the criteria listed in ITB 34.1 (a) – (b), other relevant factors are as follows:

Bidders are required to complete and submit Form AT1-LTB: Attachment No. 1 to the Letter of Technical Bid, providing details of their Technical Proposal.

Evaluation of the Bidder’s Technical Proposal will include an assessment of the Bidder’s technical capacity to mobilize key equipment and personnel for the contract consistent with its proposal regarding work methods, scheduling, and material sourcing in sufficient detail and fully in accordance with the requirements stipulated in Section 6 (Employer’s Requirements). All the required details shall be provided by the Bidder in Section 4.

Non-compliance with equipment and personnel requirements described in Section 6 (Employer’s Requirements) shall not normally be a ground for bid rejection and such non-compliance will be subject to clarification during bid evaluation and rectification prior to contract award.

Technical proposals which are unable to satisfy the Section 6 (Employer’s Requirements) shall be rejected.

The following documents and information should be submitted.

1. Single line diagram;
2. Process design calculation;
3. Process unit sizing calculation;
4. Piping and instrumentation diagram;
5. Process flow diagram/mass balance;
6. General arrangement drawings, including plants and sections for all major structures;
7. Equipment arrangement and layouts;
8. Equipment specifications and data sheet;
9. Process description/narrative;
10. Hydraulic profile/calculations;
11. Method statement for construction specifically for intake and outfall;
12. Organization of the team for the contract, including DB and OM;
13. Testing and commissioning method statement;
14. Training plan;
15. Implementation schedule with methods statement;
16. Specifications of general pipes, pumps and other equipment
17. Any other material that the Bidder wishes to add to demonstrate its understanding of and its plans for achieving each of the Key Factors listed in Table 3-3.

The guide for Technical Evaluation is described below;

1.1.1 Introduction to Technical Evaluation Guide

Single Stage - Two Envelope process is being used. One envelope contains the Technical Bid and this subsection refers to the content of this envelope. The material contained in the Technical Bid envelope will be assessed using the steps shown in Table 3-1.

Table 3-1 Technical Bid Evaluation Steps

Step	Description
1	The submitted material is checked for its completeness; that is whether all the material that has been requested has been provided
2	The qualification material submitted is assessed to determine whether the Bidder

	satisfies the qualification requirements (mostly Section 3 of the Bidding Document)
3	The submission is assessed to determine whether Bidder satisfies the technical requirements (mostly Section 6 of the Bidding Document)

This document contains the technical bid evaluation criteria that will be used in Step 3. There are six evaluation criteria and these are listed in Table 3-2. These criteria articulate the Employer's Requirements.

Table 3-2 Technical Bid Evaluation Criteria

No.	Requirement Type	Name
1	Functional	Produce Water – Quantity and Quality
2	Functional	Provide for Augmentation
3	Functional	Provide Buildings, Services and Amenities
4	Functional	Hand Back Operations
5	Management	Practise Asset Management
6	Management	Practise Project Management

1.1.2 Bid Evaluation Key Factors

Each of the six technical bid evaluation criteria has one or more key success factors that must be satisfied for the project to achieve its objective. These key factors shall be used in evaluating the bids. Table 3.3 contains these key factors. The related documents / information should be indicated for relevant key factors.

Table 3-3 Technical Evaluation Criteria Key Factors

No.	Criterion	Key Factors	
1	Functional Requirement: Produce Water – Quantity and Quality	1	24 MLD capacity is provided
		2	6/12/18/24 incremental supply is provided - quantity
		3	95.9% quantity reliability is achievable
		4	The specified water quality is provided
		5	6/12/18/24 incremental supply is provided – quality
		6	100% quality reliability is achievable
2	Functional Requirement: Provide for Augmentation	1	Allowance for 24 MLD to 48 MLD capacity is provided
		2	Allowance for a Boron reduction from 2.4 mg/l to 1 mg/l is provided
		3	Allowance for the installation of a DAF system is provided
3	Functional Requirement: Provide Buildings, Services and Amenities	1	Buildings are provided and fitted out as specified
		2	Secure Access is provided to site and buildings
		3	Electricity is provided to all the parts of the plant
		4	Other Services and Amenities are provided
4	Functional Requirement: Hand Back Operations	1	NWSDB staff are trained and competent
		2	Assets are in the expected condition at hand back
		3	Systems are in the expected condition at hand back

		4	Adequate spares are provided at hand back
5	Management Requirement: Practise Asset Management	1	Assets design lives are achieved
		2	Supply is matched to demand
		3	Operational efficiency is maximised
		4	1. Incident management is provided 2. Emergency management is provided
		5	Compliance with standards and codes is achieved
6	Management Requirement: Practise Project Management	1	Timelines are met
		2	Budget and costs and managed
		3	Quality is delivered
		4	Audits are undertaken
		5	Social responsibilities are met
		6	Environmental responsibilities are met
		7	Data and documentation are managed
		8	Reports and meeting are managed
		9	Good conduct and professional behaviour are practised

1.2 Alternative Technical Solutions

Technical alternatives not applicable

1.3 Economic Evaluation

In addition to the criteria listed in ITB 39.2 I (a)–(e), other relevant factors are as follows:

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

1.3.1 Quantifiable Deviations and Omissions

Quantifiable Deviations and Omissions from the contractual obligations: the evaluation shall be based on the evaluated cost of fulfilling the contract in compliance with all contractual obligations under this Bidding Document.

1.3.2 Time Schedule

No credit will be given for earlier completion of the Works. Offers with longer periods would be rejected.

1.3.3 Operating and Maintenance Costs

Seven (7) years’ Operating and Maintenance (O&M) Costs shall be as per Schedule No. 5: Operation Services of the Letter of Price Bid.

1.3.4 Functional Guarantees of the Facilities

The requirements for functional guarantees required are given in the Table 15.1, Chapter 15 of Section 6 - Employer’s Requirement.

Bids offering Functional Guarantees, which are not satisfying the requirements given in the Table 15.1, Chapter 15 of Section 6 - Employer's Requirement shall be rejected for non-compliance.

1.3.5 Work, Services, Facilities, etc., to be provided by the Employer

Where bids include the undertaking of work or the provision of services or facilities by the Employer in excess of the provisions allowed for in the bidding document, such bids shall be rejected for non-compliance.

1.3.6 Specific Additional Criteria

The relevant evaluation method, if any, shall be as follows: **Not applicable**

1.3.7 Domestic Preference

Not applicable

1.4 Multiple Contracts

Not applicable

2. Qualification

Except for Sub-clauses 2.3.2, 2.4.1(c), and 2.4.2 (1) it is the legal entity or entities comprising the Bidder, and not the Bidder's parent companies, subsidiaries, or affiliates, that must satisfy the qualification criteria described below.

As regards to meeting the minimum qualification requirements for Sub-clauses 2.3.2, 2.4.1 (c) and 2.4.2 (1), a Bidder shall be permitted to claim the experience, capability and/or financial resources of one or more of its affiliates (as defined below), provided that:

- in the case of non-SPV affiliates (as defined below), it is required that (i) each such affiliate satisfies the eligibility criteria set out in Sub-clause 2.1 of this Section 3 and (ii) the Bidder submits with its bid an irrevocable guarantee from such non-SPV affiliate substantially in the form in Attachment 1 to Form FIN – 2, Attachment 2 to Form EXP – 1 (c) and/or Attachment 1 to Form EXP – 2 (a) in Section 4 – Bidding Forms or in such other form as is reasonably acceptable to the Employer. Failure to furnish a suitable guarantee may result in the rejection of the Bidder; and
- in the case of affiliates that are SPVs, only those SPVs in which the bidder is one of the SPV's partners will be considered, and the bidder may claim the experience earned by an SPV only to the extent of the bidder's specific contribution to the contract completion in the SPV. To demonstrate the foregoing, the Bidder shall submit with its bid (i) corporate documentation (or equivalent) for the SPV; (ii) documentation that shows the technical capacity, expertise and resources contributed by the Bidder to the SPV; and (iii) evidence that the same technical capacity, expertise and resources of the SPV claimed by the Bidder is capable of being, and will be, made available to the Bidder. Failure to furnish the foregoing documentation and evidence may result in the rejection of the Bidder.

For purposes of Sub-clauses 2.3.2, 2.4.1 (c) and 2.4.2 (1), an "affiliate" of the Bidder means any entity directly or indirectly controlling, controlled by, or under common control with the Bidder, where "control" means ownership of a majority of the voting interests in such entity (collectively, "non-SPV affiliates"). Notwithstanding the foregoing, an "affiliate" shall also include any special purpose vehicle (SPV) in which the Bidder has an interest and through which the Bidder has previously carried out procurement-related activities, regardless of whether the Bidder controls such SPV.

2.1 Eligibility

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	

2.1.1 Nationality

Nationality in accordance with ITB Sub clause 4.2.	must meet requirement	must meet requirement	must meet requirement	not applicable	Forms ELI - 1; ELI - 2 with attachments
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2.1.2 Conflict of Interest

No conflicts of interest in accordance with ITB Sub clause 4.3.	must meet requirement	must meet requirement	must meet requirement	not applicable	Letter of Technical Bid
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2.1.3 ADB Eligibility

Not having been declared ineligible by ADB, as described in ITB Sub clause 4.4.	must meet requirement	must meet requirement	must meet requirement	not applicable	Letter of Technical Bid
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2.1.4 Government-Owned Enterprise

Bidder required to meet conditions of ITB Sub clause 4.5.	must meet requirement	must meet requirement	must meet requirement	not applicable	Forms ELI - 1; ELI - 2 with attachments
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2.1.5 United Nations Eligibility

Not having been excluded by an act of compliance with a UN Security Council resolution in accordance with ITB Sub clause 4.7.	must meet requirement	must meet requirement	must meet requirement	not applicable	Letter of Technical Bid
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2.2 Pending Litigation and Arbitration

Pending litigation and arbitration criterion shall apply.

2.2.1 Pending Litigation and Arbitration

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
All pending litigation and arbitration against only the bidder, if any, shall be treated as resolved and so shall in total not represent more than fifty (50%) percent of the Bidder's net worth for the last year calculated as the difference between total assets and total liabilities.	must meet requirement by itself or as partner to past or existing Joint Venture	not applicable	must meet requirement by itself or as partner to past or existing Joint Venture	not applicable	Form LIT - 1

2.3 Financial Requirements

2.3.1 Historical Financial Performance

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Submission of audited financial statements or, if not required by the law of the Bidder's country, other financial statements acceptable to the Employer, for the last five (5) years to demonstrate the current soundness of the Bidder's financial position. As a minimum, the Bidder's net worth for the last year calculated as the difference between total assets and total liabilities should be positive.	must meet requirement	not applicable	must meet requirement	not applicable	Form FIN - 1 with attachments

2.3.2 Average Annual Turnover

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
Minimum average annual turnover of 100 million USD calculated as total certified payments received for contracts in progress or completed, for the last five (5) years.	must meet requirement ¹	must meet requirement	must meet 40% of the requirement	must meet 80% of the requirement	Form FIN - 2

¹

A bidder may claim the annual turnover of any one or more of its affiliates for purposes of meeting the minimum qualification requirements for this criterion.

2.3.3 Financial Resources¹

If the bid evaluation process and the decision for the award of the Contract takes more than one (1) year from the date of bid submission, Bidders shall be asked to resubmit their current contract commitments and latest information on financial resources supported by latest audited accounts / audited financial statements, or if not required by the law of the Bidder's country, other financial statements acceptable to the Employer, and the Bidders' financial capacity shall be reassessed on this basis.

Criteria Requirement	Compliance Requirements				Documents Submission Requirements
	Single Entity	Joint Venture			
		All Partners Combined	Each Partner	One Partner	
The Bidder must demonstrate that it has the financial resources to meet:					
(a) its current contract commitments, as defined in FIN-4 (Total Financial Requirements for Current Contract Commitments), plus	must meet requirement	must meet requirement	must meet requirement for its own contractual commitments	not applicable	Form FIN - 4
(b) the requirements for the Subject Contract of 15 million USD	must meet requirement	must meet requirement	must meet 40% of the requirement	must meet 80% of the requirement	Form FIN – 3 and Form FIN - 4

¹ The employer has the option to move this criterion from Section 3 (Evaluation and Qualification Criteria) to Section 6 (Employer's Requirements), in which case
(a) the Employer shall confirm compliance with the financial resources prior to award of contract in accordance with ITB 42.1 Award Criteria; and
(b) in place of the Financial Resources criterion, the employer shall require the bidder to submit together with its bid, and for confirmation during bid evaluation, a Letter of Undertaking to comply with the financial resources given in Section 6 prior to award of contract.

2.4 Bidder's Experience

2.4.1 Contracts of Similar Size and Nature

Criteria	Compliance Requirements			Documents	
	Single Entity	Joint Venture		Submission Requirements	
All Partners Combined		Each Partner	One Partner		
<p>a. Participation in four (4) contracts that are similar to the Design and Build portion of the proposed works:</p> <ol style="list-style-type: none"> 1) within the last 10 years; 2) that have been successfully completed; 3) with potable water production capacity of 24 MLD or more using SWRO Desalination Process; 4) where the value of the Bidder's participation in Design and Build portion of each contract exceeds USD 50 million. 	must meet requirement	must meet requirement	must meet at least one contract requirement	must meet at least three contracts requirement	Form EXP – 1a
<p>b. Participation in two (2) contracts that are similar to the Design and Build portion of the proposed works:</p> <ol style="list-style-type: none"> 1. Outside the Bidder's home country; 2. within the last 10 years; 3. that have been successfully completed; 4. with potable water production capacity of 24 MLD or more using SWRO Desalination Process; 5. where the value of the Bidder's participation in Design and Build portion of each contract exceeds USD 50 million. 	must meet requirement	must meet requirement	must meet at least one contract requirement	not applicable	Form EXP – 1b

Criteria	Compliance Requirements			Documents	
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
c. Participation in one (1) contract where the Bidder has a minimum experience of 7 years of O&M Services: <ol style="list-style-type: none"> 1) within the last 10 years; 2) that are similar to the proposed works; 3) with a plant availability time of 93% or greater; 4) with potable water production capacity of 24 MLD or more using SWRO Desalination Process 	must meet requirement 1	not applicable	must meet requirement	Not applicable	EXP – 1c

“Similar” means the Bidder’s participation shall be in a contract to produce “potable water” which includes; Seawater Intake, Pre-treatment, Reverse Osmosis system, Post treatment and effluent disposal system

¹ A bidder may claim the experience of any one or more of its affiliates for purposes of meeting the minimum qualification requirements for this criterion.

2.4.2 Experience in Key Activities (Bidder's Capability and Capacity)

Must be complied with by the Bidder unless permitted as a subcontracted item under Criterion 2.5 of Section 3. In the case that the Bidder intends to subcontract all or part of the activity then the provisions of Criterion 2.5 of Section 3 shall apply. The Key activities shall be shown by the Bidder by considering his whole experience.

Criteria	Compliance Requirements				Documents
	Requirement	Single Entity	Joint Venture		
All Partners Combined			Each Partner	One Partner	Submission Requirements
For the above or other contracts executed during the period stipulated in 2.4.1 above, a minimum experience in the following key activities:					
1. Ongoing O&M services of 50 MLD or more supply of drinking water from a SWRO Desalination Plant with a plant availability time of 93% or greater	must meet requirements ¹	not applicable	not applicable	must meet requirements	Form EXP –2a
2. Participation in one completed contract; (i) of a buried off shore sea water intake; and (ii) a buried off shore brine outfall with a diffuser at the outlet located in the sea, both of more than 500m length from the shoreline and for a capacity of 50 MLD or more using SWRO desalination process.	must meet requirements	not applicable	not applicable	must meet requirements	Form EXP –2b

¹ A bidder may claim the experience of any one or more of its affiliates for purposes of meeting the minimum qualification requirements for this criterion.

2.5 Subcontractors

Subcontractors or Manufacturers for the following major items of plant and services must meet the following minimum criteria, herein listed for that item.

Item No.	Description of Item	Minimum Criteria to be met	Documents Submission Requirements
	For Subcontractors (SC)		
1	Construction of buried off shore sea water intake, buried brine outfall and diffuser	The subcontractor shall have successfully completed at least one (1) contract in the past ten years involving construction of a marine structure and pipe laying works in the ocean but within the vicinity of the shoreline using barge mounted construction equipment or similar	Form EXP – 3a (SC)
2	Civil works for the general services facilities	The subcontractor shall have at least 10 years' experience of major civil engineering and building projects. The subcontractor shall have completed at least one (1) civil engineering project with a contract value of US 5 million or more in the last five years.	Form EXP – 3b (SC)
3	Ancillary, Electrical Supply System and Other Support Services	The subcontractor shall have at least 10 years' experience in similar works and completed at least one similar contract.	Form EXP – 3c (SC)
4	Instrumentation and Controls	The subcontractor shall have at least 10 years' experience in similar works and completed at least one similar contract.	
5	Laying of potable water conveyance from the SWRO plant to the main water supply trunk with fittings	The subcontractor shall have at least 10 years' experience in water supply system with specific experience in "Laying of pipeline of minimum 600 mm dia. with fittings and minimum 2km in length".	Form EXP – 3d (SC)
	For manufacturers (M)		
1	Isobaric Pressure-exchanger type Energy Recovery System	The Isobaric Pressure-exchanger type Energy Recovery System should be the PX type pressure exchangers manufactured by Energy Recovery Incorporated, USA or equivalent (ref. Chapter 7. Reverse Osmosis System of the Section 6. ERQ).	Form EXP – 3a (M)
2	Reverse Osmosis System	Reverse Osmosis system design shall be based on the use of spiral-wound, polyamide composite type membrane elements. Suitable RO membrane products of standard 8-inch diameter by 40-inch length from the following manufacturers are acceptable to be used for this	Form EXP – 3b (M)

		project: Dow Chemical - Filmtec (USA), Hydranautics (Japan), and Toray (Japan) or equivalent (ref. Chapter 7. Reverse Osmosis System of the Section 6. ERQ).	
3	Pipes	The manufacturer shall have ISO certification. The list of suppliers for DI pipe shall be within NWSDB - list of Suppliers.	Form EXP – 3c (M)
4	Pumps	The manufacturer shall have ISO certification. The Pumps shall be to a standard as manufactured by Grundfos, KSB or equivalent	Form EXP – 3d (M)

Note:

Bidders are strongly encouraged to list more than one subcontractor against each line item of plant and services listed above, as permitted under ITB Sub Clause 17.2. Any subcontractors that are subsequently determined to be unacceptable, pursuant to ITB Sub Clause 35.4, shall not be included in the list of approved subcontractors in the corresponding appendix to the Contract Agreement.

If all listed subcontractors relating to an item of plant and services are determined to be unacceptable pursuant to ITB Sub Clause 35.4, the Bid will not be rejected, but the Bidder will be required to substitute at least one acceptable manufacturer or subcontractor without any change to the bid price or the accepted technical specifications. If a Bidder does not provide an acceptable substitute manufacturer or subcontractor by the date and time set in the Employer's request for substitution of manufacturer or subcontractor, its Bid may then be rejected.

In the case of a Bidder who offers to supply and install major items of plant under the contract, which the Bidder did not manufacture or otherwise produce, the Bidder shall provide the Manufacturer's authorization, using the form provided in Section 4 (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 install that item in the Employer's country. Failure to submit the Manufacturer's authorization at the first instance is considered a minor, nonmaterial omission and shall be subject to clarification. However, failure of the Bidder to submit the omitted authorization shall lead to rejection of the Subcontractor or Manufacturer of the item under evaluation in accordance with ITB 35.4.

Prior to signing the Contract, the corresponding Appendix to the Contract Agreement shall be completed, listing the approved manufacturers or subcontractors for each item concerned.

Section 4 - Bidding Forms

This section contains the forms to be completed by the Bidder and submitted as part of its Bid.

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Section 4A- Bidding Forms Volume 1 (Technical Bid)

Letter of Technical Bid

-- Note --

The bidder must accomplish the Letter of Technical Bid on its letterhead clearly showing the bidder's complete name and address.

Date:
 ICB No.:
 Invitation for Bid No.:

Name of Contract: **Design, Build and Operate (DBO) of a 24 MLD Sea Water Reverse Osmosis (SWRO) Desalination Plant at Thalaiyadi, Jaffna District, Sri Lanka**
 Contract No: **PEIC/JKWSSP/SEA WATER REVERSE OSMOSIS PLANT/2015/01**

To:

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. _____
- (b) We accordingly offer to design, execute and complete the Works and remedy any defects therein so that they are fit for the purposes defined in the Contract, and to operate and maintain the facility under license from the Employer for the period and in conformity with the terms and conditions contained in the Contract.
- (c) Our Bid consisting of the Technical Bid and the Price Bid shall be valid for a period of 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.
- (d) We, including any Subcontractors or Manufacturers for any part of the Contract, have or will have nationalities from eligible countries, in accordance with ITB 4.2.
- (e) We, including any Subcontractors or Suppliers for any part of the Contract, do not have any conflict of interest in accordance with ITB 4.3.
- (f) We are not participating, as a Bidder in more than one bid in this bidding process in accordance with ITB 4.3(e), other than alternative offers submitted in accordance with ITB 13.
- (g) Our firm, its affiliates or subsidiaries, including any Subcontractors or Suppliers for any part of the contract, has not been declared ineligible by ADB, under the Employer's country laws or official regulations or by an act of compliance with a decision of the United Nations Security Council.
- (h) [We are not a government-owned enterprise] / [We are a government-owned enterprise but meet the requirements of ITB 4.5].¹
- (i) We agree to permit ADB or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB.
- (j) If our Bid is accepted, we commit to mobilizing key equipment and personnel in accordance with the requirements set forth in Section 6 (Employer's Requirements) and our technical proposal, or as otherwise agreed with the Employer.
- (k) We certify that all the information provided in our technical proposal has been prepared with reasonable diligence, is true and complete to the best of our knowledge. We are fully aware that inaccurate, incomplete or misleading information in our technical proposal will not be tolerated and the Employer reserves the right to reject our technical proposal on these grounds.

¹ Use one of the two options as appropriate.

- (l) Please see attached filled-up Form AT1-LTB: Attachment No. 1 to the Letter of Technical Bid, providing detailed reference to our Technical Proposal.

Name
In the capacity of
Signed
.....
Duly authorized to sign the Bid for and on behalf of
Date
.....

Form AT1- LTB: Attachment No. 1 to the Letter of Technical Bid

Description	Requirements reference in Section 6. ERQ	Bidder's Reference on Compliance of Technical Proposal
General Questions		
1. Is the desalination plant designed to produce average daily flow of 24 MLD per day?	Chapter 1, 1.2.1	
2. Is the plant designed for availability factor of 96%?	Chapter 1, 1.2.1	
3. Are all plant intake, outfall and treatment systems designed to accommodate plant expansion to 48 MLD?	Chapter 1, 1.3	
4. Has provision been made for further Boron removal?		
5. Are all metal pipes, valves, equipment and instruments directly in contact with seawater or brine made of super duplex stainless steel of PREN of 40 or more?	Chapter 3 – 3.8.2.2 & Chapter 5	
Plant Layout		
6. Does the proposed desalination plant layout fit into the plant site described in the Employer's Requirements?	Chapter 4	
7. Does the plant layout included in the proposal show the location and size of the construction laydown area?	Chapter 4	
8. Is the plant layout configured such that it can accommodate plant expansion to 48 MLD?	Chapter 4	
Seawater Intake Facility System		
9. Is the proposed intake structure an offshore intake tower	Chapter 5 – 5.2.1	
10. Is the proposed intake tower located at a water depth of 10 meters or more?	Chapter 5 – 5.2.1	
11. Is the intake tower screen through-screen velocity lower than or equal to 0.15 m/s?	Chapter 5 – 5.2.1	
12. Are the intake pipes made of high-density polyethylene (HDPE)?	Chapter 5 – 5.2.2	
13. Are the intake pipes completely buried under the surface of the ocean bottom?	Chapter 5 – 5.2.2	
14. Are the intake screen bars made of copper-nickel or super duplex stainless steel with PREN of 40 or more?	Chapter 5 – 5.3.2	
15. Is the intake system equipped with dual redundant (duty / standby) sodium hypochlorite feed system allowing to deliver this disinfectant at the intake tower?	Chapter 5 – 5.1	
16. Are the intake pumps designed to convey flow determined for total plant recovery of 45% and the plant production capacity of 24 MLD (Note: the actual plant recovery may be higher to provide improved efficiency however the intake pumps shall have higher flow capacity for lower recovery under certain operating conditions)	Chapter 5 – 5.1	
17. Are all metal components of the intake system protected against corrosion by a cathodic protection system?	Chapter 5 – 5.3.1	
18. Is the intake system equipped with magnetic flow meter, which is grounded?	Chapter 5 – 5.5	
19. Is the intake pump station equipped with online instruments to monitor the concentration of hydrocarbons, temperature and conductivity in the source seawater?	Chapter 5	
Pre-treatment Facilities		
20. Does the proposed pre-treatment system meet the Employer's requirements defined in Table 6-1 of the Technical	Chapter 6	

Specifications of the ERQ (Chapter 6 – Pre-treatment Facilities)?		
21. <i>Deleted</i>	Chapter 6	
22. <i>Deleted</i>	Chapter 6	
23. Has the Bidder provided at least three (3) reference projects where the bidder has used the proposed pre-treatment system?"	Chapter 6	
24. <i>Deleted</i>	Chapter 6	
25. <i>Deleted</i>	Chapter 6	
Reverse Osmosis System		
26. Is the Bidder proposing to use standard 8-inch SWRO membrane elements manufactured by one of the following three companies: Hydranautics, Toray or Dow Filmtec or equivalent? If equivalent, have the details on the membranes been provided.	Chapter 7 – 7.2.2	
27. Is the SWRO membrane useful life guaranteed to be at least five (5) years?	Attachment 1	
28. Does the proposed SWRO system consist of four (4) 6 MLD RO trains capable to operate at the same efficiency in a permeate production flow range?	Chapter 7 – 7.1	
29. Is the average design flux of the SWRO membrane elements per pressure vessel (calculated with all RO trains in service) lower than or equal to 14 liters per square meter per hour (Lmh)?	Chapter 7 – 7.2.2	
30. Is the maximum design flux of the SWRO membrane elements, calculated with one RO train out of service, lower than or equal to 16 liters per square meter per hour (Lmh)?	Chapter 7 – 7.2.2	
31. Is the SWRO system energy use lower than 3.8 kWh/m ³ of produced permeate?	Chapter 3 – 3.12.3	
32. Does the proposed RO system have a separate clean-in-place (CIP) membrane cleaning system?	Chapter 7 – 7.2.3	
33. Is the SWRO system equipped with pressure surge control devices?	Chapter 3 - 3.8.2.3	
34. Do the SWRO high-pressure pumps have energy efficiency higher than 83%?	Chapter 7	
35. Does the proposed RO system have a membrane flushing system?	Chapter 7 – 7.2	
36. Does the proposed RO system have isobaric pressure-exchanger type energy recovery system manufactured by Energy Recovery Incorporated, USA or equivalent? If equivalent, please provide complete details on your technical proposal.	Chapter 7 – 7.2	
37. Are the internal components of all high-pressure pumps, which are in contact with seawater, made of super duplex stainless steel with PREN of 40 or higher?	Chapter 7	
38. Are the internal components of all concentrate booster pumps, made of super duplex stainless steel with PREN of 40 or higher?	Chapter 7	
39. Are all high-pressure steel pipes valves, instruments and other components in contact with seawater or concentrate, made of super duplex stainless steel with PREN of 40 or higher?	Chapter 3 – 3.8.2.2 & Chapter 5	

40. Does the proposal contain SWRO membrane system performance projections for new (1 year) and old (5 year) membranes for the minimum and maximum ranges salinity and temperature presented in Table 2-1 & 2-2 provided in the Employer's Requirements and do the projections indicate that the RO system can meet the product water quality specifications defined in Table 2-4 (SLS 614 -2013 / NWSDB Standards)?"	Chapter 2 & 7	
41. Does the RO system have design criteria compliant with the requirements defined in Chapter 7 – Reverse Osmosis System of the Employer's Requirements?	Chapter 7	
Potable Water Post-Treatment Facilities		
42. Is permeate stabilization system using lime and carbon dioxide or calcite and carbon dioxide provided in the proposal?	Chapter 8	
43. Is disinfection system for feed of sodium hypochlorite used for disinfection of the desalinated water?	Chapter 8	
44. Do the permeate stabilization system and the desalinated water disinfection system have design criteria compliant with the requirements defined in Chapter 8 –Potable Water Post-Treatment Facilities of the Employer's Requirements?	Chapter 8	
Potable Water Conveyance and Storage Facilities		
45. Is desalination plant provided with a potable water storage tank with an active capacity of 10,000 m ³ ?	Chapter 9	
46. Deleted	Chapter 9	
47. Do the potable water conveyance and storage facilities have design criteria compliant with the requirements defined in Chapter 9 – Potable Water Conveyance and Storage Facilities of the Employer's Requirements?	Chapter 9	
Concentrate and Other Waste Discharge Facilities		
48. Is the proposed discharge outfall designed such that the diffuser system is at least 300 m away from the location of the plant intake?	Chapter 10	
49. Is the proposed discharge diffuser pipe located at near to 500 meters from the shore?	Chapter 10	
50. Is the discharge outfall pipe conveying concentrate (brine) from the desalination plant to the diffusers completely buried under the surface of the ocean bottom?	Chapter 10	
51. Is the discharge system designed to convey 100% of the maximum plant discharge flow (including concentrate and all other plant waste streams) calculated at 45% recovery and maximum plant fresh water production capacity of 48 MLD?	Chapter 10	
52. Is the discharge pipe made of high-density polyethylene (HDPE)?	Chapter 10	
53. Is the diffuser system designed such that the exit velocity from the diffusers can be maintained at 3 to 4 m/s at an angle of 60° to the horizontal all times	Chapter 10	
54. Is the discharge retention tank designed for a retention time of all waste streams (except for concentrate) for 2 hours?	Chapter 10	
55. Do the desalination plant outfall and the discharge retention tank have design criteria compliant with the requirements defined in Chapter 10 – Concentrate and Other Waste Discharge Facilities of the Employer's Requirements?	Chapter 10	
56. Is the discharge retention tank equipped with mixing system and has feed lines for sodium hydroxide, sulfuric acid and sodium bisulphite to adjust the water quality in the tank?	Chapter 10	
General Service Facilities		
57. Does the desalination plant proposed by the Bidder have the general service facilities described in Chapter 11 – General Service Facilities of the Employer's Requirements?	Chapter 11	

58. Does the Administration Building in the Bidder proposal contain rooms of the type and minimum size specified in Table 11-1 of Chapter 11 – General Service Facilities of the Employer's Requirements?	Chapter 11	
59. Are the general service facilities in the Bidder proposal designed to comply with the requirements defined in Chapter 11 – General Service Facilities of the Employer's Requirements?	Chapter 11	
Ancillary and Support Services		
60. Does the desalination plant proposed by the Bidder have the ancillary and support facilities described in Chapter 12 – Ancillary and Support Facilities of the Employer's Requirements?	Chapter 12	
61. Are the ancillary and support facilities in the Bidder proposal designed to comply with the requirements defined in Chapter 12 – Ancillary and Support Facilities of the Employer's Requirements?	Chapter 12	
Instrumentation and Controls		
62. Does the desalination plant proposed by the Bidder have the SCADA system, instrumentation and controls described in Chapter 13 – Instrumentation and Controls of the Employer's Requirements?	Chapter 13	
63. Are the instrumentation and controls in the Bidder proposal designed to comply with the requirements defined in Chapter 13 – Instrumentation and Controls of the Employer's Requirements?	Chapter 13	
Electrical Supply System		
64. Does the desalination plant proposed by the Bidder have the electrical supply system described in Chapter 14 – Electrical Supply System of the Employer's Requirements?	Chapter 14	
65. Is the Electrical and Control System in the Bidder proposal designed to comply with the requirements defined in Chapter 14 – Electrical Supply System of the Employer's Requirements?	Chapter 14	
Performance Guarantees		
66. Is the desalination plant proposed by the Bidder guaranteed to produce 24 MLD while in compliance with all pertinent regulatory requirements and product water quality specifications indicated in the Employer's Requirements over the entire duration of the Operation Service Period?	Chapter 15	
67. Is the Bidder providing SWRO membranes with a service life of 5 years or more?	Chapter 15	
68. Is the Bidder providing cartridge filters with a minimum of 0.5 years' useful life warranty? Is such guarantee extended over the entire duration of the Operate Service Period?	Chapter 15	
69. Is the Bidder providing High Pressure RO Pumps, Motors, Energy Recovery Devices (ERDs), and Variable Frequency Drives (VFDs) with a minimum of 5-year extended performance efficiency warranty, commencing on the date of satisfactory completion of the Project Acceptance Test and initiation of the plant Operation Service Period? Is such guarantee extended over the entire duration of the Operation Service Period?	Chapter 15	
70. Is the Bidder providing Pre-treatment System with a 5-year extended warranty for all primary components of the pre-treatment system, and 5-year warranty for the membrane modules (if membrane pre-treatment is proposed) commencing on the date of satisfactory completion of Project Acceptance Test? Is such guarantee extended over the entire	Chapter 15	

duration of the Operation Service contract term?		
71. Is the Bidder providing a Product Water Storage Tank at the 24 MLD Plant and Other Storage Facilities which are Part of the Product Water Distribution System with at least a 2-year extended warranty commencing on the date of satisfactory completion of Project Acceptance Test? Is such guarantee extended over the entire duration of the Operation Service Period?	Chapter 15	
72. Is the total desalination plant energy use below 3.8 kWh/m ³ of produced fresh water? Is the Bidder guaranteeing such maximum energy use over the entire duration of the Operation Service contract term?	Chapter 15	
Operation Services		
73. Has the Bidder provided description of the overall facility process and equipment control strategy for the following key plant facilities as requested in Chapter 16 (Operation Management Requirements) of the Section 6 Employer's Requirements: a. Intake System; b. Pre-treatment System; c. RO System; d. Post-treatment System; e. Membrane Cleaning & Flushing Systems; f. Product Water Pump Station & Transfer Pipeline; g. Waste Stream Management?	Chapter 16	
74. Has the Bidder provided an Operation Service staffing plan indicating the number and type of employees they propose to employ?	Chapter 16	
75. Has the Bidder provided description of the Computerized Maintenance Management System they propose to use for the Jaffna SWRO desalination project?	Chapter 16	
76. Does the Operation Service section of the Bidder proposal comply with the requirements defined in Chapter 16 – Operation Management Requirements of Employer's Requirements?	Chapter 16	

Bid Security

Bank Guarantee

.....*Bank's name, and address of issuing branch or office*¹

Beneficiary:*Name and address of employer*

Date:.....

Bid Security No.:

We have been informed that *name of the bidder*. (hereinafter called "the Bidder") has submitted to you its bid dated (hereinafter called "the Bid") for the execution of *name of contract* under Invitation for Bids No. ("the IFB").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we *name of Bank*. hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *amount in figures* (. *amount in words*) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

- (a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Letters of Technical and Price Bid; or
- (b) does not accept the correction of errors in accordance with the Instructions to Bidders (hereinafter "the ITB"); or
- (c) having been notified of the acceptance of its Bid by the Employer during the period of bid validity, (i) fails or refuses to execute the Contract Agreement, or (ii) fails or refuses to furnish the Performance Security, in accordance with the ITB.

This guarantee will expire (a) if the Bidder is the successful Bidder, upon our receipt of copies of the Contract Agreement signed by the Bidder and the Performance Security issued to you upon the instruction of the Bidder; or (b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder of the name of the successful Bidder, or (ii) 28 days after the expiration of the Bidder's bid.

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

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.²

.....*Bank's seal and authorized signature(s)*

- Note -

In case of a joint venture, the bid security must be in the name of all partners to the joint venture that submits the bid.

¹ All italicized text is for use in preparing this form and shall be deleted from the final document.

² Or 758 as applicable.

Technical Proposal

1. Site Organisation

2. Method Statement

2.1. Check list for Method of Statement

2.2. Specific similar experience for confirming the past experiences in the proposed method statement

3. Mobilization Schedule

4. Construction Schedule

5. Plant

6. Personnel

7. Equipment

8. Proposed Subcontractors for Major Items of Plant and Services

9. Manufacturer's Authorization

10. Time Schedule (Overall Project Program)

11. Functional Guarantee of the Proposed Facilities

Note: Further details of these are provided in the pages below

1. SITE ORGANISATION

- a) Bidder to provide an overall Organization chart with key roles, names and responsibilities of all project team members, their location and duration of deployment;
- b) The Bidder shall also identify other specialist construction sub-contractor(s), their key resources;
- c) The Bidder shall identify the RO system process/design engineering Consultants and any other key specialists or service providers proposed for the SWRO Project;

2. METHOD STATEMENT

2.1 Check list for Method of Statement

Deleted

2.2 Specific similar experience for confirming the past experiences in the proposed method statement

Bidder shall provide at least one reference project where the Bidder has designed and constructed

similar work as proposed in the Method Statement. Bidder shall provide the supportive documents such as award of contract, completion certificate and contract agreement If Partner in a JV or Sub contractor, etc.

2.2.1 SWRO Desalination Plant System

Bidder's confirmation that all process equipment and pumps, will be procured by the Bidder from reputable manufacturers that have proven and reliable operating experience on at least three(3) existing SWRO Desalination Plants that are operating references by the Bidder.

- i. Employer's Name
- i. Contact Person
- ii. Address
- iii. Telephone/Fax Number
- iv. Email Address
- v. Type of Equipment
- vi. Manufacturer

2.2.2 Sea water Intake System

Bidder shall provide the following details in respect of their existing Clients to demonstrate capability, capacity and experience in respect of seawater intake system:

- i. Employer's Name
- ii. Contact Person
- iii. Address
- iv. Telephone/Fax Number
- v. Email Address
- vi. Intake Type (any)
- vii. Capacity
- viii. Purpose of pipe laying
- ix. Pipe Type (Bidder shall provide three reference projects if the Bidder select other than the HDPE)
- x. Pipe Diameter
- xi. Construction method (drilling/dredging/excavation/ laying at sea bed)
- xii. Pipeline cleaning method
- xiii. Value of the work for Intake system only (with supporting document)
- xiv. Work carried out through Single entity/JV/Sub Contractor
- xv. If subcontractor involved in the above mentioned construction then details of the subcontractor
 - a) Name
 - b) Address
 - c) Telephone/Fax Number
 - d) Email Address

2.2.3 Pre-Treatment System

It is very important to note that the Bidder offers a pretreatment system, which they have used (designed and operated) successfully in the past at other full-scale seawater desalination projects. Bidder shall provide the following details in respect of their existing Clients to demonstrate capability, capacity and experience in respect of pre-treatment system works:

- i. Employer's Name
- ii. Contact Person
- iii. Address

- iv. Telephone/Fax Number
- v. Email Address
- vi. Type of Pretreatment
- vii. Year of construction

2.2.4 Concentrate and other Waste Discharge Facilities

Bidder shall provide the following details in respect of their existing Clients to demonstrate capability, capacity and experience in respect of brine diffuser works:

- i. Employer's Name
- ii. Contact Person
- iii. Address
- iv. Telephone/Fax Number
- v. Email Address
- vi. Pipe Type
- vii. Pipe diameter
- viii. Type of diffuser
- ix. Value of the work – Pipe laying and diffuser with supporting document
- x. Work carried out through Single entity/JV/Sub Contractor
- xi. If subcontractor involved in the above mentioned construction then details of the subcontractor
 - a. Name
 - b. Address
 - c. Telephone/Fax Number
 - d. Email Address

3. MOBILISATION SCHEDULE

Bidder's Name:

Name of Contract:

N°	Activity ¹ (D-..)	Months												
		1	2	3	4	5	6	7	8	9	n	TOTAL	
	{e.g.,													
1	Mobilization													
2	Design Preparation													
3													
4	Issuance of Construction permit													
5	Commencement of the Works													
6													
7	Test													

1. List the construction activities with the breakdown for activities required to produce them and other benchmarks such as the Statutory or Engineer's approvals Indicate the activities, benchmarks, etc separately for each Section of the Works, if any.
2. Duration of activities shall be indicated in a form of a bar chart.
3. Include a legend, if necessary, to help read the chart including:
 - a. anticipated construction rates for key construction activities
 - b. anticipated sources of the key construction materials and associated transportation distances

4. CONSTRUCTION SCHEDULE

Bidder's Name:

Name of Contract:

The Bidder shall provide general description of the arrangements and method statement which the Bidder intends to adopt for the execution of the Works.

The Bidder's arrangements and method statement should demonstrate their adequacy for satisfactory execution of the Works outlined in the Contractor's Proposal.

5. PLANT

Bidder's Name:

Name of Contract:

The Bidder shall list key construction equipment necessary for satisfactory execution of the Works proposed by the Bidder in the Contractor's Proposal.

A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder. The Bidder shall provide all the information requested below, to the extent possible. Fields with asterisk (*) shall be used for evaluation.

Type 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 <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

The following information shall be provided only for equipment not 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	

6. PERSONNEL

Form PER – 1: Proposed Personnel

Bidders should provide the details of proposed personnel for both Construction and Operation and Maintenance and their experience record in the relevant Information Forms below for each of the candidate.

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

-- Note --

** As listed in Section 6 (Employer's Requirements).*

7. EQUIPMENT

Form EQU: Equipment

The Bidder shall provide adequate information and details to demonstrate clearly that it has the capability to meet the equipment requirements indicated in Section 6 (Employer’s Requirements), using the Forms below. 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 <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

Omit the following information for equipment owned by the Bidder.

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	

8. PROPOSED SUBCONTRACTORS AND/OR MANUFACTURERS OF MAJOR ITEMS OF PLANT AND SERVICES

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 Services	Proposed Subcontractors	Nationality

Major Items of Plant and Services	Proposed Manufacturers	Nationality

9. MANUFACTURER'S AUTHORISATION

Date: *[insert date (as day, month and year) of bid submission]*
 ICB No.: *[insert number of bidding process]*

To: *[insert complete name of employer]*

WHEREAS

We *[insert complete name of manufacturer or manufacturer's authorized agent]*, who are official manufacturers or agent authorized by the Manufacturer 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 the General Conditions of Contract, with respect to the goods offered by the above firm.

Signed: *[insert signature(s) of authorized representative(s) of the manufacturer]*

Name: *[insert complete name(s) of authorized representative(s) of the manufacturer]*

Title: *[insert title]*

Duly authorized to sign this Authorization on behalf of: *[insert complete name of bidder]*

Dated on _____ day of _____, _____ *[insert date of signing]*

-- Note --

The bidder shall require the manufacturer to fill out 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. The bidder shall include it in its bid, if so indicated in the BDS.

10. TIME SCHEDULE

To be used by Bidder when alternative Time for Completion is invited in ITB 13.2.

11. FUNCTIONAL GUARANTEE OF THE PROPOSED FACILITIES

The Bidder shall copy on the left column of the table below, the identification of each functional guarantee required in the Specification and stated by the Employer in EQC 1.3.4 of Section 3, Evaluation and Qualification Criteria, and on the right column, provide the corresponding value for each functional guarantee of the proposed plant and equipment.

Functional Guarantee <i>[as required by the Employer in Section 3]</i>	Functional Guarantee Value Offered by the Bidder
1.	
2.	
3.	
...	

Bidder's Qualification

To establish its qualifications to perform the contract in accordance with Section 3 (Evaluation and Qualification Criteria) the Bidder shall provide the information requested in the corresponding Information Sheets included hereunder.

Form ELI - 1: Bidder's Information Sheet

Bidder's Information	
Bidder's legal name	
In case of Joint Venture, legal name of each partner	
Bidder's country of constitution	
Bidder's year of constitution	
Bidder's legal address in country of constitution	
Bidder's authorized representative (name, address, telephone numbers, fax numbers, e-mail address)	
<p>Attached are copies of the following documents:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1. In case of single entity, articles of incorporation or constitution of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2 <input type="checkbox"/> 2. Authorization to represent the firm or Joint Venture named above, in accordance with ITB 22.2 <input type="checkbox"/> 3. In case of Joint Venture, letter of intent to form Joint Venture or Joint Venture agreement, in accordance with ITB 4.1 <input type="checkbox"/> 4. In case of a government-owned enterprise, any additional documents not covered under 1 above required to comply with ITB 4.5 	

Form ELI - 2: Joint Venture Information Sheet

Each member of the Joint Venture must fill out this form separately. Subcontractor must fill out this form.

Joint Venture/Subcontractor Information	
Bidder's legal name	
Joint Venture Partner's or Subcontractor's legal name	
Joint Venture Partner's or Subcontractor's country of constitution	
Joint Venture Partner's or Subcontractor's year of constitution	
Joint Venture Partner's or Subcontractor's legal address in country of constitution	
Joint Venture Partner's or Subcontractor's authorized representative information (name, address, telephone numbers, fax numbers, e-mail address)	
<p>Attached are copies of the following documents:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1. Articles of incorporation or constitution of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2 <input type="checkbox"/> 2. Authorization to represent the firm named above, in accordance with ITB 22.2 <input type="checkbox"/> 3. In the case of government-owned enterprise, documents establishing legal and financial autonomy and compliance with commercial law, in accordance with ITB 4.5 	

Subcontractors are those listed in Technical Proposal – Proposed Subcontractors and/or Manufacturers for Major Items of Plant and Services.

Form LIT – 1: Pending Litigation and Arbitration

Each Bidder must fill out this form if so required under Criterion 2.2 of Section 3 (Evaluation and Qualification Criteria) to describe any pending litigation or arbitration formally commenced against it. In case of joint ventures, each Joint Venture Partner must fill out this form separately, and provide the Joint Venture Partner name below:
 Joint Venture Partner: _____

Pending Litigation and Arbitration			
Choose one of the following:			
<input type="checkbox"/> No pending litigation and arbitration.			
<input type="checkbox"/> Below is a description of all pending litigation and arbitration against the Bidder (or each Joint Venture member if Bidder is a Joint Venture).			
Year	Matter in Dispute	Value of Pending Claim in US\$ Equivalent	Value of Pending Claim as a Percentage of Net Worth

- Note -

This form shall only be included if Criterion 2.2 of Section 3 (Evaluation and Qualification Criteria) is applicable.

Form FIN - 1: Historical Financial Performance

Each Bidder must fill out this form.

In case of joint ventures, each Joint Venture Partner must fill out this form separately, and provide the Joint Venture Partner name below:

Joint Venture Partner: _____

Financial Data for Previous Five (5) Years [US\$ Equivalent]				
Year 1:	Year 2:	Year 3:	Year 4:	Year 5:

Information from Balance Sheet

Total Assets (TA)					
Total Liabilities (TL)					
Net Worth = TA-TL					
Current Assets (CA)					
Current Liabilities (CL)					
Working Capital = CA - CL					

Most Recent Working Capital		To be obtained for most recent year and carried forward to FIN-3 Line 1; in case of Joint Ventures, to the corresponding Joint Venture Partner's FIN-3
------------------------------------	--	--

Information from Income Statement

Total Revenues					
Profits Before Taxes					
Profits After Taxes					

- Attached are copies of financial statements (balance sheets including all related notes, and income statements) for the last five (5) years, as indicated above, complying with the following conditions.
- Unless otherwise required by Section 3 of the Bidding Documents, all such documents reflect the financial situation of the legal entity or entities comprising the Bidder and not the Bidder's parent companies, subsidiaries or affiliates.
 - Historical financial statements must be audited by a certified accountant.
 - Historical financial statements must be complete, including all notes to the financial statements.
- Historical financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).

Form FIN - 2: Average Annual Turnover

Each Bidder must fill out this form.

The information supplied should be the Annual Turnover of the Bidder or each member of a Joint Venture in terms of the amounts billed to clients for each year for work in progress or completed, converted to US dollars at the specified exchange rate.

In case of joint ventures, each Joint Venture Partner must fill out this form separately, and provide the Joint Venture Partner name below:

Joint Venture Partner: _____

Annual Turnover Data for the Last Five (5) Years			
Year	Amount Currency	Exchange Rate	US\$ Equivalent
Average Annual Turnover			

Attachment 1 to Form FIN - 2: Average Annual Turnover
AFFILIATE COMPANY GUARANTEE

Name of Contract/Contract No.:

Name and address of Employer:

(together with successors and assigns).

We have been informed that

(name of Contractor)

(hereinafter called the "Contractor") is submitting an offer for the above-referenced Contract in response to your invitation, and that the conditions of your invitation require its offer to be supported by an affiliate company guarantee.

In consideration of you, the Employer, awarding the Contract to the Contractor, we

(name of affiliated company)

irrevocably and unconditionally guarantee to you, as a primary obligation, that (i) throughout the duration of the Contract, we will make available to the Contractor our financial, technical capacity, expertise and resources required for the Contractor's satisfactory performance of the Contract; and (ii) we are fully committed, along with the Contractor, to ensuring a satisfactory performance of the Contract.

If the Contractor fails to so perform its obligations and liabilities and comply with the Contract, we will indemnify the Employer against and from all damages, losses and expenses (including legal fees and expenses) which arise from any such failure for which the Contractor is liable to the Employer under the Contract.

This guarantee shall come into full force and effect when the Contract comes into full force and effect. If the Contract does not come into full force and effect within a year of the date of this guarantee, or if you demonstrate that you do not intend to enter into the Contract with the Contractor, this guarantee shall be void and ineffective. This guarantee shall continue in full force and effect until all the Contractor's obligations and liabilities under the Contract have been discharged, when this guarantee shall expire and shall be returned to us, and our liability hereunder shall be discharged absolutely.

This guarantee shall apply and be supplemental to the Contract as amended or varied by the Employer and the Contractor from time to time. We hereby authorize them to agree on any such amendment or variation, the due performance of which and compliance with which by the Contractor are likewise guaranteed hereunder. Our obligations and liabilities under this guarantee shall not be discharged by any allowance of time or other indulgence whatsoever by the Employer to the Contractor, or by any variation or suspension of the works to be executed under the Contract, or by any amendments to the Contract or to the constitution of the Contractor or the Employer, or by any other matters, whether with or without our knowledge or consent.

This guarantee shall be governed by the law of the same country (or other jurisdiction) as that which governs the Contract and any dispute under this guarantee shall be finally settled under the [Rules or Arbitration provided in the Contract]. We confirm that the benefit of this guarantee may be assigned subject only to the provisions for assignment of the Contract.

Signed by: _____ Signed by: _____
(signature) *(signature)*

(name) *(name)*

(position in parent/subsidiary company) *(position in parent/subsidiary company)*

Date: _____

Form FIN – 3: Availability of Financial Resources

Bidders must demonstrate sufficient financial resources, usually comprising of Working Capital supplemented by credit line statements or overdraft facilities and others to meet the Bidder's financial requirements for

- (a) its current contract commitments, and
- (b) the subject contract.

In case of joint ventures, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner name below:

Joint Venture Partner: _____

Financial Resources		
No.	Source of financing	Amount (US\$ equivalent)
1	Working Capital (to be taken from FIN-1)	
2	Credit Line ^a	
3	Other Financial Resources	
Total Available Financial Resources		

^a To be substantiated by a letter from the bank issuing the line of credit.

Form FIN- 4: Financial Requirements for Current Contract Commitments

Bidders (or each Joint Venture partner) 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 case of joint ventures, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner name below:

Joint Venture Partner: _____

Current Contract Commitments						
No .	Name of Contract	Employer's Contact (Address, Tel, Fax)	Contract Completion Date	Outstanding Contract Value (X)	Remaining Contract Period in months (Y)	Monthly Financial Resources Requirement (X / Y)
1						
2						
3						
4						
Total Monthly Financial Requirement for Current Contract Commitments						US\$

Form FIN - 5: Compliance Check of Financial Resources (Criterion 2.3.3 of Section 3)

Form FIN-5A: For Single Entities

For Single Entities:	Total Available Financial Resources from FIN-3 (C)	Total Monthly Financial Requirement for Current Contract Commitments (CCC) from FIN-4 (D)	Available Financial Resources net of CCC (C-D)	≥	Requirement ^a
(Name of Bidder)				≥	100% of Requirement from Section 3 - 2.3.3(b)

Form FIN-5B: For Joint Ventures

For Joint Ventures:	Total Available Financial Resources from FIN-3 (C)	Total Monthly Financial Requirement for Current Contract Commitments (CCC) from FIN-4 (D)	Available Financial Resources net of CCC (C-D)	≥	Requirement ^a
One Partner:				≥	B(%) of Requirement
(Name of Partner)				≥	
Each (Other) Partner:				≥	A(%) of Requirement
(Name of Partner 1)				≥	
(Name of Partner 2)				≥	
(Name of Partner 3)				≥	
All partners combined			$\sum (C-D)^b =$	≥	100% of Requirement from Section 3 - 2.3.3(b)

Form FIN – 5 is made available for use by the bidder as a self-assessment tool, and by the employer as evaluation work sheet, to determine compliance with financial resources.

^a Requirement for the subject contract is defined in Criterion 2.3.3(b) of Section 3. Value A is the required percentage of the subject contract, which each partner must meet; and value B is the required percentage of the subject contract, which one partner must meet. A and B values are defined in Criterion 2.3.3 of Section 3 (Evaluation and Qualification Criteria).

^b $\Sigma (C - D)$ = sum of available financial resources net of current contract commitments (CCC) for all partners.

Form EXP – 1 (a): Contracts of Similar Size and Nature

Fill up one (1) form per Contract. The Bidder shall provide the supportive documents such as award of contract, completion certificate and other details as requested in Table below. The agreement shall provide If Partner in a JV or Subcontractor. Please also fill up the Form EXP – 1 (a) Attachment.

Contract of Similar Size and Nature		
Contract No of	Contract Identification	
Award Date	Completion Date	
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	US\$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's name Address Telephone number Fax number E-mail		
Description of the similarity in accordance with Criterion 2.4.1 of Section 3		
a. Participation in four (4) contracts that are similar to the Design and Build portion of the proposed works: <ol style="list-style-type: none"> 1) within the last 10 years; 2) that have been successfully completed; 3) with potable water production capacity of 24 MLD or more using SWRO Desalination Process; 4) where the value of the Bidder's participation in Design and Build portion of each contract exceeds USD 50 million. 		

Attachment to Form EXP – 1 (a) Contracts of Similar Size and Nature

Fill up one (1) form per Contract.

Construction Firm Details							
1	Company Name						
2	Country of Origin						
Reference Project Details							
3	Construction Country						
4.	Employer's Contact Person						
5	Defect Liability period						
6 Description of the Similarity under taken by the Bidder in accordance with Criteria 2.4.1 of Section 3							
	Description of Works	Type	Capacity in MLD	Amount of work in million USD	Position of company		
					Single Entity	JV Lead partner Associate Partner	Sub-contractor
6.1	Design of intake, Raw water main, Pretreatment , RO plant, Post Treatment and Sea out fall	NA					
6.2	Intake						
6.3	Pre Treatment						
6.4	RO Plant						
6.5	Post Treatment						
6.6	Brine Outfall						
6.7	Operation and maintenance						
7 Any other Civil Works included in this contact							
	Description of Works	Type	Amount of work in million USD	Position of company			
				Single Entity	JV Lead partner Associate Partner	Sub-contractor	
7.1							
7.2							
8	Any further description about this contract.						

Form EXP – 1 (b): Contracts of Similar Size and Nature

Fill up one (1) form per Contract. The Bidder shall provide the supportive documents such as award of contract, completion certificate and other details as requested in Table below. The agreement shall provide If Partner in a JV or Subcontractor. Please also fill up the Form EXP – 1 (b) Attachment.

Contract of Similar Size and Nature		
Contract No of	Contract Identification	
Award Date	Completion Date	
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	US\$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's name Address Telephone number Fax number E-mail		
Description of the similarity in accordance with Criterion 2.4.1 of Section 3		
b. Participation in two (2) contracts that are similar to the Design and Build portion of the proposed works: <ol style="list-style-type: none"> 1. Outside the Bidder's home country; 2. within the last 10 years; 3. that have been successfully completed; 4. with potable water production capacity of 24 MLD or more using SWRO Desalination Process; 5. where the value of the Bidder's participation in Design and Build portion of each contract exceeds USD 50 million. 		

Attachment to Form EXP – 1 (b) Contracts of Similar Size and Nature.

Fill up one (1) form per Contract.

Construction Firm Details							
1	Company Name						
2	Country of Origin						
Reference Project Details							
3	Construction Country						
4.	Employer's Contact Person						
5	Defect Liability period						
6 Description of the Similarity under taken by the Bidder in accordance with Criteria 2.4.1 of Section 3							
	Description of Works	Type	Capacity in MLD	Amount of work in million USD	Position of company		
					Single Entity	JV Lead partner Associate Partner	Sub-contractor
6.1	Design of intake, Raw water main, Pretreatment , RO plant, Post Treatment and Sea out fall	NA					
6.2	Intake						
6.3	Pre Treatment						
6.4	RO Plant						
6.5	Post Treatment						
6.6	Brine Outfall						
6.7	Operation and maintenance						
7 Any other Civil Works included in this contact							
	Description of Works	Type	Amount of work in million USD	Position of company			
				Single Entity	JV Lead partner Associate Partner	Sub-contractor	
7.1							
7.2							
8 Any further description about this contract.							

Form EXP – 1 (c): Contracts of Similar Size and Nature

Fill up one (1) form per Contract. The Bidder shall provide the supportive documents such as award of contract, completion certificate and other details as requested in Table below. The agreement shall provide If Partner in a JV or Subcontractor. Please also fill up the Form EXP – 1 (c) Attachment 1.

Contract of Similar Size and Nature		
Contract No of	Contract Identification	
Award Date	Completion Date	
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	US\$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's name Address Telephone number Fax number E-mail		
Description of the similarity in accordance with Criterion 2.4.1 of Section 3		
c. Participation in one (1) contract where the Bidder has a minimum experience of 7 years of O&M Services: <ol style="list-style-type: none"> 1) within the last 10 years; 2) that are similar to the proposed works; 3) with a plant availability time of 93% or greater; 4) with potable water production capacity of 24 MLD or more using SWRO Desalination Process 		

Attachment 1 to Form EXP – 1 (c) Contracts of Similar Size and Nature.

Fill up one (1) form per Contract.

Construction Firm Details								
1	Company Name							
2	Country of Origin							
Reference Project Details								
3	Construction Country							
4.	Employer's Contact Person							
5	Defect Liability period							
6 Description of the Similarity under taken by the Bidder in accordance with Criteria 2.4.1 of Section 3								
	Description of Works	Type	Capacity in MLD	Amount of work in million USD	Position of company			Sub-contractor
					Single Entity	JV		
					Lead partner	Associate Partner		
6.1	Design of intake, Raw water main, Pretreatment , RO plant, Post Treatment and Sea out fall	NA						
6.2	Intake							
6.3	Pre Treatment							
6.4	RO Plant							
6.5	Post Treatment							
6.6	Brine Outfall							
6.7	Operation and maintenance							
7 Any other Civil Works included in this contact								
	Description of Works	Type	Amount of work in million USD	Position of company			Sub-contractor	
				Single Entity	JV			
				Lead partner	Associate Partner			
7.1								
7.2								
8	Any further description about this contract.							

Attachment 2 to Form EXP – 1 (c) Contracts of Similar Size and Nature.
AFFILIATE COMPANY GUARANTEE

Name of Contract/Contract No.:

Name and address of Employer:

_____ (together with successors and assigns).

We have been informed that

_____ (name of Contractor)

(hereinafter called the "Contractor") is submitting an offer for the above-referenced Contract in response to your invitation, and that the conditions of your invitation require its offer to be supported by an affiliate company guarantee.

In consideration of you, the Employer, awarding the Contract to the Contractor, we

_____ (name of affiliated company)

irrevocably and unconditionally guarantee to you, as a primary obligation, that (i) throughout the duration of the Contract, we will make available to the Contractor our financial, technical capacity, expertise and resources required for the Contractor's satisfactory performance of the Contract; and (ii) we are fully committed, along with the Contractor, to ensuring a satisfactory performance of the Contract.

If the Contractor fails to so perform its obligations and liabilities and comply with the Contract, we will indemnify the Employer against and from all damages, losses and expenses (including legal fees and expenses) which arise from any such failure for which the Contractor is liable to the Employer under the Contract.

This guarantee shall come into full force and effect when the Contract comes into full force and effect. If the Contract does not come into full force and effect within a year of the date of this guarantee, or if you demonstrate that you do not intend to enter into the Contract with the Contractor, this guarantee shall be void and ineffective. This guarantee shall continue in full force and effect until all the Contractor's obligations and liabilities under the Contract have been discharged, when this guarantee shall expire and shall be returned to us, and our liability hereunder shall be discharged absolutely.

This guarantee shall apply and be supplemental to the Contract as amended or varied by the Employer and the Contractor from time to time. We hereby authorize them to agree on any such amendment or variation, the due performance of which and compliance with which by the Contractor are likewise guaranteed hereunder. Our obligations and liabilities under this guarantee shall not be discharged by any allowance of time or other indulgence whatsoever by the Employer to the Contractor, or by any variation or suspension of the works to be executed under the Contract, or by any amendments to the Contract or to the constitution of the Contractor or the Employer, or by any other matters, whether with or without our knowledge or consent.

This guarantee shall be governed by the law of the same country (or other jurisdiction) as that which governs the Contract and any dispute under this guarantee shall be finally settled under the [Rules or Arbitration provided in the Contract]. We confirm that the benefit of this guarantee may be assigned subject only to the provisions for assignment of the Contract.

Signed by: _____	Signed by: _____
(signature)	(signature)
_____	_____
(name)	(name)
_____	_____
(position in parent/subsidiary company)	(position in parent/subsidiary company)

Date: _____

Form EXP – 2 (a): Experience in Key Activities

Fill up one (1) form per Contract. The Bidder shall provide the supportive documents such as award of contract, completion certificate and other details as requested below table. The agreement shall provide If Partner in a JV or Subcontractor.

Contract with Similar Key Activities		
Contract No of	Contract Identification	
Award Date	Completion Date	
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	US\$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's name Address Telephone number Fax number E-mail		
Description of the key activities in accordance with Criterion 2.4.2 of Section 3		
Criterion 2.4.2 of Section 3 For the above or other contracts executed during the period stipulated in 2.4.1 above, a minimum experience in the following key activities: a Ongoing O&M services of 50 MLD or more supply of drinking water from a SWRO Desalination Plant with a plant availability time of 93% or greater		

Attachment 1 to Form EXP – 2 (a) Experience in Key Activities.

AFFILIATE COMPANY GUARANTEE

Name of Contract/Contract No.:

Name and address of Employer:

_____ (together with successors and assigns).

We have been informed that

_____ (name of Contractor)

(hereinafter called the "Contractor") is submitting an offer for the above-referenced Contract in response to your invitation, and that the conditions of your invitation require its offer to be supported by an affiliate company guarantee.

In consideration of you, the Employer, awarding the Contract to the Contractor, we

_____ (name of affiliated company)

irrevocably and unconditionally guarantee to you, as a primary obligation, that (i) throughout the duration of the Contract, we will make available to the Contractor our financial, technical capacity, expertise and resources required for the Contractor's satisfactory performance of the Contract; and (ii) we are fully committed, along with the Contractor, to ensuring a satisfactory performance of the Contract.

If the Contractor fails to so perform its obligations and liabilities and comply with the Contract, we will indemnify the Employer against and from all damages, losses and expenses (including legal fees and expenses) which arise from any such failure for which the Contractor is liable to the Employer under the Contract.

This guarantee shall come into full force and effect when the Contract comes into full force and effect. If the Contract does not come into full force and effect within a year of the date of this guarantee, or if you demonstrate that you do not intend to enter into the Contract with the Contractor, this guarantee shall be void and ineffective. This guarantee shall continue in full force and effect until all the Contractor's obligations and liabilities under the Contract have been discharged, when this guarantee shall expire and shall be returned to us, and our liability hereunder shall be discharged absolutely.

This guarantee shall apply and be supplemental to the Contract as amended or varied by the Employer and the Contractor from time to time. We hereby authorize them to agree on any such amendment or variation, the due performance of which and compliance with which by the Contractor are likewise guaranteed hereunder. Our obligations and liabilities under this guarantee shall not be discharged by any allowance of time or other indulgence whatsoever by the Employer to the Contractor, or by any variation or suspension of the works to be executed under the Contract, or by any amendments to the Contract or to the constitution of the Contractor or the Employer, or by any other matters, whether with or without our knowledge or consent.

This guarantee shall be governed by the law of the same country (or other jurisdiction) as that which governs the Contract and any dispute under this guarantee shall be finally settled under the [Rules or Arbitration provided in the Contract]. We confirm that the benefit of this guarantee may be assigned subject only to the provisions for assignment of the Contract.

Signed by: _____ Signed by: _____
(signature) (signature)

(name) (name)

(position in parent/subsidiary company) (position in parent/subsidiary company)

Date: _____

Form EXP – 2 (b): Experience in Key Activities

Fill up one (1) form per Contract. The Bidder shall provide the supportive documents such as award of contract, completion certificate and other details as requested below table. The agreement shall provide If Partner in a JV or Subcontractor.

Contract with Similar Key Activities		
Contract No of	Contract Identification	
Award Date	Completion Date	
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	US\$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's name Address Telephone number Fax number E-mail		
Description of the key activities in accordance with Criterion 2.4.2 of Section 3		
Criterion 2.4.2 of Section 3 For the above or other contracts executed during the period stipulated in 2.4.1 above, a minimum experience in the following key activities: b. Participation in one completed contract (i) of a buried off shore sea water intake; and (ii) a buried off shore brine outfall with a diffuser at the outlet located in the sea, both of more than 500m length from the shoreline and for a capacity of 50 MLD or more using SWRO desalination process.		

Form EXP – 3a (SC): Subcontractors

Fill out one (1) form per contract. The Bidder shall provide the supporting documents such as award of contract, completion certificate and other details as requested in Table below.

Contract for the Major Items		
Contract No of	Contract Identification	
Award Date	Completion Date	
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	US\$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's name Address Telephone number Fax number E-mail		
Description of the major items in accordance with Criterion 2.5 of Section 3		
Construction of buried off shore sea water intake, buried brine outfall and diffuser		

Form EXP – 3b (SC): Subcontractors

Fill out one (1) form per contract. The Bidder shall provide the supporting documents such as award of contract, completion certificate and other details as requested in Table below.

Contract for the Major Items		
Contract No of	Contract Identification	
Award Date	Completion Date	
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	US\$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's name Address Telephone number Fax number E-mail		
Description of the major items in accordance with Criterion 2.5 of Section 3		
Civil works for the general services facilities		

Form EXP – 3c (SC): Subcontractors

Fill out one (1) form per contract. The Bidder shall provide the supporting documents such as award of contract, completion certificate and other details as requested in Table below.

Contract for the Major Items		
Contract No of	Contract Identification	
Award Date	Completion Date	
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	US\$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's name Address Telephone number Fax number E-mail		
Description of the major items in accordance with Criterion 2.5 of Section 3		
Ancillary, Electrical Supply System and Other Support Services.		

Form EXP – 3d (SC): Subcontractors

Fill out one (1) form per contract. The Bidder shall provide the supporting documents such as award of contract, completion certificate and other details as requested in Table below.

Contract for the Major Items		
Contract No of	Contract Identification	
Award Date	Completion Date	
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	US\$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's name Address Telephone number Fax number E-mail		
Description of the major items in accordance with Criterion 2.5 of Section 3		
Instrumentation and Controls		

Form EXP – 3e (SC): Subcontractors

Fill out one (1) form per contract. The Bidder shall provide the supporting documents such as award of contract, completion certificate and other details as requested in Table below.

Contract for the Major Items		
Contract No of	Contract Identification	
Award Date	Completion Date	
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	US\$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's name Address Telephone number Fax number E-mail		
Description of the major items in accordance with Criterion 2.5 of Section 3		
Laying of potable water conveyance from the SWRO plant to the main water supply trunk with fittings		

Form EXP – 3a (M): Subcontractors (Manufacturer)

Fill out one (1) form per contract. The Bidder shall provide the supporting documents such as award of contract, completion certificate and other details as requested in Table below.

Contract for the Major Items					
Contract No of	Contract Identification				
Award Date	Completion Date				
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor				
Total Contract Amount	US\$				
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Percent of Total</td> <td style="width: 50%;">Amount</td> </tr> <tr> <td style="height: 40px;"></td> <td></td> </tr> </table>	Percent of Total	Amount		
Percent of Total	Amount				
Employer's name Address Telephone number Fax number E-mail					
Description of the major items in accordance with Criterion 2.5 of Section 3					
Isobaric Pressure-exchanger type Energy Recovery System					

Form EXP – 3b (M): Subcontractors (Manufacturer)

Fill out one (1) form per contract. The Bidder shall provide the supporting documents such as award of contract, completion certificate and other details as requested in Table below.

Contract for the Major Items		
Contract No of	Contract Identification	
Award Date	Completion Date	
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	US\$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's name Address Telephone number Fax number E-mail		
Description of the major items in accordance with Criterion 2.5 of Section 3		
Reverse Osmosis System		

Form EXP – 3c (M): Subcontractors (Manufacturer)

Fill out one (1) form per contract. The Bidder shall provide the supporting documents such as award of contract, completion certificate and other details as requested in Table below.

Contract for the Major Items		
Contract No of	Contract Identification	
Award Date	Completion Date	
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	US\$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's name Address Telephone number Fax number E-mail		
Description of the major items in accordance with Criterion 2.5 of Section 3		
All the pipes		

Form EXP – 3d (M): Subcontractors (Manufacturer)

Fill out one (1) form per contract. The Bidder shall provide the supporting documents such as award of contract, completion certificate and other details as requested in Table below.

Contract for the Major Items		
Contract No of	Contract Identification	
Award Date	Completion Date	
Role in Contract	<input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor	
Total Contract Amount	US\$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Employer's name Address Telephone number Fax number E-mail		
Description of the major items in accordance with Criterion 2.5 of Section 3		
Pumps and other equipment		

Section 4B- Bidding Forms Volume 2 (Price Bid)

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Letter of Price Bid

-- Note --

The bidder must accomplish the Letter of Price Bid on its letterhead clearly showing the bidder's complete name and address.

Date:

ICB No.:

Invitation for Bid No.:

Name of Contract: **Design, Build and Operate (DBO) of a 24 MLD Sea Water Reverse Osmosis (SWRO) Desalination Plant at Thalaiyadi, Jaffna District, Sri Lanka**

Contract No: **PEIC/JKWSSP/SEA WATER REVERSE OSMOSIS PLANT/2015/01**

To:

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Document, including Addenda issued in accordance with Instructions to Bidders (ITB) 8. _____
- (b) We accordingly offer to design, execute and complete the Works and remedy any defects therein so that they are fit for the purposes defined in the Contract, and to operate and maintain the facility under license from the Employer for the period and in conformity with the terms and conditions contained in the Contract.
- (c) The total bid price, excluding any discounts offered in item (d) below is the sum of

[amount of foreign currency in words], [amount in figures], and [amount of local currency in words], [amount in figures]

- (d) *The total bid price from the Grand Summary (Schedule No. 7) should be entered by the Bidder inside this box. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the bid.*

e discounts offered and the methodology for their application are as follows: _____

- (e) Our Bid shall be valid for a period of 270 days from the date fixed for the 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 will provide the required Performance Security, and commence and complete the Works, and provide the Operation Service, in accordance with the above-named documents and the agreed programme.
- (g) We further undertake, together with the Employer, to jointly appoint the DAB and the Auditing Body in accordance with the requirements of the Contract.
- (h) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract: ¹

Name of Recipient	Address	Reason	Amount
.....
.....

- (i) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed.

¹ If none has been paid or is to be paid, indicate "None."

- (j) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
- (k) We agree to permit ADB or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB.
- (l) We certify that all the information provided in our price proposal has been prepared with reasonable diligence, is true and complete to the best of our knowledge. We are fully aware that inaccurate, incomplete or misleading information in our price proposal will not be tolerated and the Employer reserves the right to reject our price proposal on these grounds.

Name

In the capacity of

Signed

.....

Duly authorized to sign the Bid for and on behalf of

Date

Price Schedules

Preamble

General

1. The Price Schedules are divided into separate Schedules as follows:
 - Schedule No. 1: Plant, and Mandatory Spare Parts Supplied from Abroad
 - Schedule No. 2: Plant and Mandatory Spare Parts Supplied from within the Employer's Country
 - Schedule No. 3: Design Services
 - Schedule No. 4: Build Services
 - Schedule No. 5: Operation Services
 - Schedule No. 6: Asset Replacement Fund and Schedule
 - Schedule No. 7: Grand Summary
2. The Schedules do not generally give a full description of the Plant to be supplied and Works and the services to be performed under each item. Bidders shall be deemed to have read the Employer's Requirements and other sections of the Bidding Document and reviewed the Drawings to ascertain the full scope of the requirements included in each item prior to filling in the rates and prices. The entered rates and prices shall be deemed to cover the full scope as aforesaid, including overheads and profit.
3. If Bidders are unclear or uncertain as to the scope of any item, they shall seek clarification in accordance with ITB 7 prior to submitting their bid.

Pricing

4. The units and rates in figures entered into the Price Schedules should be typewritten or if written by hand, must be in print form. Price Schedules not presented accordingly may be considered nonresponsive. Any alterations necessary due to errors, etc., shall be initialed by the Bidder. As specified in the Bid Data Sheet and Particular Conditions of Contract, prices shall be fixed and firm for the duration of the Contract, or prices shall be subject to adjustment in accordance with the corresponding Appendix (Price Adjustment) to the Contract Agreement.
5. Bid prices shall be quoted in the manner indicated and in the currencies specified in the Instructions to Bidders in the Bidding Document. For each item, Bidders shall complete each appropriate column in the respective Schedules, giving the price breakdown as indicated in the Schedules. Prices given in the Schedules against each item shall be for the scope covered by that item as detailed in Section 6 (Employer's Requirements) or elsewhere in the Bidding Document. The amounts entered shall exclude VAT.
6. Payments will be made to the Contractor in the currency or currencies indicated under each respective item.
7. When requested by the Employer for the purposes of making payments or part payments, valuing variations or evaluating claims, or for such other purposes as the Employer may reasonably require, the Contractor shall provide the Employer with a breakdown of any composite or lump sum items included in the Schedules.
8.
 - A. Schedule 5: Operation Services
 1. This is a summation of bid prices in Schedule 5.1 to 5.3
 - B. Schedule 5.1: Contractor's Fixed Fee
 1. The Contractor's Fixed Fee covers all fixed expenses for the Operation Service, including all staff and personnel, administration, contracted services, audit, guarantees, insurances, permits, fixed maintenance costs, overhead & profit. The detailed description and breakdown shall be provided.
 2. The amounts entered shall exclude VAT.
 - C. Schedule 5.2: Contractor's Variable Rate

1. The Contractor's Variable Rate (CVR) covers output-related O&M costs including chemicals and other consumables and output related maintenance expenses and cost for disposal of solid waste as mentioned in Employer's Requirement (Section 6). The detailed description and breakdown shall be provided.
2. The Contractor's Monthly Variable Payment will be determined by multiplying the CVR by the production volume as measured at the inlet of the Potable Water tanks.
3. For the avoidance of doubt, the volumes specified in the Bid Price Form [5.2] are estimates which are used for the purposes of bid price comparisons. The Contractor will be paid on the actual amounts of production.
4. The Contractor's Variable Rate (CVR) shall include all installation costs to ensure no degradation of membrane or asset life of components for Year 1,2,3,4 and 5.
5. The amounts entered shall exclude VAT.

D. Schedule 5.3: Contractor's Electricity Payment

1. The Guaranteed Energy Efficiency value entered by Bidders shall not be greater than the value specified in the Schedule of Guarantees in Section 6 of the Bidding Documents. The bid value will replace the value in the Schedule of Guarantees in the event that the Bidder is successful.
2. The Guaranteed Energy Efficiency value applies to all electricity costs associated with running the SWRO Desalination Plant, administration offices and running the high lift pumps and which shall be metered (three meters) separately and quoted in Schedule 5.3.1, 5.3.2 and 5.3.3.
3. During the Operation Service Period the Contractor shall enter into a supply agreement with the Ceylon Electricity Board (CEB) and shall pay electricity invoices in accordance with the supply agreement. The Employer shall reimburse such electricity payments at cost.
4. Bidders shall note that performance damages are payable in the event that actual energy consumption fails to meet the Guaranteed Energy Efficiency specified in the Schedule of Guarantees.
5. The amounts entered shall exclude VAT.

E. Schedule 6: Asset Replacement Fund

1. Bidders shall note that under GCC 14.18 assets with a life expectancy of less than five years are NOT eligible for replacement through the Asset Replacement Fund.
2. The amounts entered shall exclude VAT.

Schedules of Rates and Prices

**Schedule 1: Plant and Mandatory Spare Parts Supplied from Abroad
(Compliance with Employer’s Requirements - Section 6)**

Item	Description	Qty.	Unit Price ¹			Total Price ¹		
			Foreign Currency Portion	Local Currency Portion	Custom Duties	Foreign Currency Portion	Local Currency Portion	Custom Duties
		(1)	(2)	(3)	(4)	(1) x (2)	(1) x (3)	(1) x (4)
1	Seawater Intake System & Raw Water Main							
2	Pre-treatment System							
3	Reverse Osmosis System							
4	Potable Water Post-treatment System							
5	Potable Water Storage and Conveyancing System							
6	Concentrate and other Waste Discharge System							
7	General Site Service Facilities							
8	Ancillary & Support Services							
9	Instrumentation and Controls							
10	Electrical Supply System							
11	Mandatory Spare Parts including O & M spares that have less than five years asset life ²							
12	Vehicles, Machinery and Equipment to be supplied from Abroad							
13	New Access Roads to SWRO Plant Site as described in Section 6: Chapter 1; Sub Clause 1.3.7 (u)							
14	Any other Item required to achieve a functional, reliable and durable plant							
15	-----							
TOTAL (to Schedule No. 1. Grand Summary)								
Name of Bidder								
Signature of Bidder								

¹ Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

² Provide the detailed breakdown of required spare parts separately

Country of Origin Declaration Form

Item	Description	Code	Country

**Schedule 2: Plant and Mandatory Spare Parts Supplied from within the Employer's country
(Compliance with Employer's Requirements - Section 6)**

Item	Description	Qty.	Unit Price ¹			Total Price ¹		
			Foreign Currency Portion	Local Currency Portion	Custom Duties	Foreign Currency Portion	Local Currency Portion	Custom Duties
		(1)	(2)	(3)	(4)	(1) x (2)	(1) x (3)	(1) x (4)
1	Seawater Intake System & Raw Water Main							
2	Pre-treatment System							
3	Reverse Osmosis System							
4	Potable Water Post-treatment System							
5	Potable Water Storage and Conveyancing System							
6	Concentrate and other Waste Discharge System							
7	General Site Service Facilities							
8	Ancillary & Support Services							
9	Instrumentation and Controls							
10	Electrical Supply System							
11	Mandatory Spare Parts including O & M spares that have less than five years asset life ²							
12	New Access Roads to SWRO Plant Site as described in Section 6: Chapter 1; Sub Clause 1.3.7 (u)							
13	Any other Item required to achieve a functional, reliable and durable plant							
14	-----							
15	-----							
TOTAL (to Schedule No. 2. Grand Summary)								
Name of Bidder								
Signature of Bidder								

¹ Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

² Provide the detailed breakdown of required spare parts separately

Country of Origin Declaration Form

Item	Description	Code	Country

Schedule No. 3. Design Services**(Compliance with Employer's Requirements - Section 6)**

Item	Description	Qty.	Unit Price ¹		Total Price ¹	
			Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion	Local Currency Portion
		(1)	(2)	(3)	(1) x (2)	(1) x (3)
1	Seawater Intake System & Raw Water Main					
2	Pre-treatment System					
3	Reverse Osmosis System					
4	Potable Water Post-treatment System					
5	Potable Water Storage and Conveyancing System					
6	Concentrate and other Waste Discharge System					
7	General Site Service Facilities					
8	Ancillary & Support Services					
9	Instrumentation and Controls					
10	Electrical Supply System					
11	New Access Roads to SWRO Plant Site as described in Section 6: Chapter 1; Sub Clause 1.3.7 (u)					
12	Any other Item required to achieve a functional, reliable and durable plant					
13	-----					
14	-----					
	TOTAL (to Schedule No. 3 Grand Summary)					
	Name of Bidder					
	Signature of Bidder					

¹Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

**Schedule 4: Build Services
(Compliance with Employer's Requirements - Section 6)**

Schedule 4: Build Services (Summary)

Item	Description	Qty.	Unit Price ¹		Total Price ¹	
			Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion	Local Currency Portion
			-----	LKR	-----	LKR
		(1)	(2)	(3)	(1) x (2)	(1) x (3)
1	Preliminaries (From Price Schedule 4.1)					
2	Installation, Testing and Commissioning (From Schedule No. 4.2)					
	Total (to Schedule No. 4 Grand Summary)					
	Name of Bidder					
	Signature of Bidder					

¹Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

Schedule 4.1: Build Services - Preliminaries

Item	Description	Qty.	Unit Price ¹		Total Price ¹	
			Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion	Local Currency Portion
		(1)	(2)	(3)	(1) x (2)	(1) x (3)
1	Allow for Insurance	1 item				
2	Establishment of Employer's Representative Main office as per Section 6 – Employer's Requirement	1 item				
3	Establishment of Employer's Representative Sub offices as per Section 6 – Employer's Requirement	1 item				
4	Maintenance of Employer's Representative Main office	30 months				
5	Maintenance of Employer's Representative Sub offices	30 months				
6	Allow for Project Name boards and Signs (both Temporary & Permanent)	1 item				
7	Allow for establishment and maintenance of Contractor's all Site facilities and Storage	1 item				
8	Allow for Provision and maintenance of Site Safety Facilities	114 months				
9	Allow for Provision for implement the Environmental Management Plan	114 months				
10	Rent, Supply and maintain [including insurance, fuel, utilities, driver etc]. 6 seats dual AC van for Employer's Representative as per Section 6 – Employer's Requirement	114 months				
11	Rent, Supply and maintain [including insurance, fuel, utilities, driver etc]. 4 wheel drive AC cabs for Employer's Representative as per Section 6 – Employer's Requirement	114 months				
12	Progress photographs as specified in Particular Specifications and monthly progress reports.	1 item				
13	Any other Item required to achieve a functional, reliable and durable plant					
14	ditto					
Total (to Schedule No. 4 Build Services (Summary))						
Name of Bidder						
Signature of Bidder						

¹Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

Schedule No. 4.2 - Build Services – Installation, Testing and Commissioning

Item	Description	Qty.	Unit Price ¹		Total Price ¹	
			Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion	Local Currency Portion
		(1)	(2)	(3)	(1) x (2)	(1) x (3)
1	Seawater Intake System & Raw Water Main					
2	Pre-treatment System					
3	Reverse Osmosis System					
4	Potable Water Post-treatment System					
5	Potable Water Storage and Conveyancing System					
6	Concentrate and other Waste Discharge System					
7	General Site Service Facilities					
8	Ancillary & Support Services					
9	Instrumentation and Controls					
10	Electrical Supply System					
11	New Access Roads to SWRO Plant Site as described in Section 6: Chapter 1; Sub Clause 1.3.7 (u)					
12	Any other Item required to achieve a functional, reliable and durable plant					
13	ditto					
14	-----					
	Total (to Schedule No. 4 Build Services (Summary)					
	Name of Bidder					
	Signature of Bidder					

¹Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

Schedule 4.3: Provisional Sums

Item	Description	Qty.	Unit Price ¹		Total Price ¹	
			Foreign Currency Portion (USD)	Local Currency Portion (LKR)	Foreign Currency Portion (USD)	Local Currency Portion (LKR)
		(1)	(2)	(3)	(1) x (2)	(1) x (3)
1	Payment for obtaining licences and approvals from road authorities (deposit and supervision charges)			10,000,000		10,000,000
2	Provision of permanent power supply to the Plant by Ceylon Electricity Board			30,000,000		30,000,000
3	Allow for pre-shipment inspection of materials by Employer's Engineers as specified in Section 6 – Employer's Requirement		75,000		75,000	
4	Allow for to recruit experts, technical and management staffs other than required by the Contract and as directed by the Employer's Representative			10,000,000		10,000,000
5	Allow for to conduct Social and Environmental Awareness Campaigns and Initiatives			12,000,000		12,000,000
6	Additional EMP implementation as identified in the EMP or as directed by the Employer			30,000,000		30,000,000
7	Allow for Social Safeguard to comply with Resettlement Plan as directed by the Employer's Representative			17,000,000		17,000,000
8	Allow for translocation & monitoring the marine species as directed by the Employer's Representative			15,000,000		15,000,000
9	Allow for Purchase and supply of vehicles for construction and O&M vehicles and equipment and as given in Section 6			300,000,000		300,000,000
10	Allow for Soil Investigation, Water quality testing, topography surveying, bathymetric study and environmental study as directed by the Employer's Representative			5,000,000		5,000,000
11	Accreditation of Regional Laboratory to ISO standard 17025			2,000,000		2,000,000
12	Appointment of Auditing Body to conduct the Independent Compliance Audit in accordance with GCC Sub - Clause 10.3		500,000		500,000	
13	Supply and installation of 1 MW Standby Sound Proof Diesel Generator with Generator Room	1	250,000		250,000	

	including all necessary spare parts and tools as describe in Section 6 - Employer's Requirements					
14	Providing Spare Parts as directed by the Employer's Representative		500,000		500,000	
15	Allow for to execute the Health and Safety Programme in accordance with Section 8 as directed by the Employer's Representative			5,000,000		5,000,000
16	Allow for to provide safe drinking water facilities (Service reservoir and distribution system) to adjoining villages of SWRO plant		800,000		800,000	
	Sub Total				2,125,000	434,000,000
	Total Provisional Sum (to Grand Summary Item No. 10)					
	Name of Bidder					
	Signature of Bidder					

**Schedule No. 5. Operation Services
(Compliance with Employer's Requirements - Section 6)**

Schedule 5: Operation Service (Summary)

Item	Description	Qty.	Unit Price ¹		Total Price ¹	
			Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion	Local Currency Portion
			-----	LKR	-----	LKR
		(1)	(2)	(3)	(1) x (2)	(1) x (3)
1	Contractor's Fixed Fee (From Price Schedule 5.1)					
2	Contractor's Variable Bid Price (From Price Schedule 5.2)					
3	Contractor's Electricity Payment (Summary) (From Price Schedule 5.3)					
	Total (to Schedule No. 5 Grand Summary)					
	Name of Bidder					
	Signature of Bidder					

¹Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

Schedule 5.1: Contractor's Annual Fixed Fee

Item	Description	Qty. Years	Unit Price per Annum ¹		Total Price ¹	
			Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion	Local Currency Portion
			-----	LKR	-----	LKR
		(1)	(2)	(3)	(1) x (2)	(1) x (3)
1	Staff and personnel	7				
2	Administration	7				
3	Contracted services	7				
4	Guarantees, insurances, permits	7				
5	Audit	7				
6	List other Fixed Fee items	7				
7	-----	7				
	Total (to Contractor's Fixed Fee – Schedule No. 5 Operation Services)					
	Name of Bidder					
	Signature of Bidder					

¹Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

Schedule 5.2: Contractor's Annual Variable Fee

Item	Description	Water production (forecast)	Unit Price per m ³		Total Price ¹		
			Foreign Currency Portion ¹	Local Currency Portion	Foreign Currency Portion ₁	Local Currency Portion	
			-----	LKR	-----	LKR	
	Describe separately for chemicals, other consumables, disposal of solid waste and other O & M related variable items	(1)	(2)	(3)	(1) X (2) X 1000 X 365	(1) X (3) X 1000 X 365	
1	For 1 st Year	6					
2	For 2 nd Year	12					
3	For 3 rd Year	18					
4	For 4 th Year	24					
5	For 5 th Year	24					
6	For 6 th Year	24					
7	For 7 th Year	24					
	Total (to Contractor's Variable Fee – Schedule No. 5 Operation Services)						
	Name of Bidder						
	Signature of Bidder						

¹Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

Schedule 5.3 Contractor's Electricity Payment**Schedule 5.3 Contractor's Electricity Payment (Summary)**

Item	Description	Qty.	Unit Price ¹		Total Price ¹	
			Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion	Local Currency Portion
			-----	LKR	-----	LKR
		(1)	(2)	(3)	(1) x (2)	(1) x (3)
1	Contractor's Electricity Payment: SWRO Plant (From Price Schedule 5.3.1)					
2	Contractor's Electricity Payment: Administration Building, Quarters, Circuit Bungalow and internal lighting (From Price Schedule 5.3.2)					
3	Contractor's Electricity Payment: Potable Water Pumps (From Price Schedule 5.3.3)					
Total (to Schedule No. 5 Operation Service)						
Name of Bidder						
Signature of Bidder						

¹Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

Schedule 5.3.1: Contractor's Electricity Payment: SWRO Plant

Item	Description	Water production (forecast)	Guaranteed Energy Efficiency Value for the SWRO plant	Annual electricity consumption	CEB Tariff	Total Price ¹
		MLD	KwHrs per m ³	KwHrs	LKR / KwHrs	LKR
		(1)	(2)	(3) = (1)X(2)X1000X365	(4)	(3) X (4)
1	For 1 st Year	6			12	
2	For 2 nd Year	12			12	
3	For 3 rd Year	18			12	
4	For 4 th Year	24			12	
5	For 5 th Year	24			12	
6	For 6 th Year	24			12	
7	For 7 th Year	24			12	
Total (to Contractor's Electricity Payment – Schedule No. 5 Operation Services)						
Name of Bidder						
Signature of Bidder						

¹Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

Schedule 5.3.2: Contractor's Electricity Payment: Administration Building, Quarters, Circuit Bungalow and internal lighting

Item	Description	Annual electricity consumption	CEB Tariff	Total Price ¹
		KwHrs	LKR / KwHrs	LKR
		(1)	(2)	(3) = (1) X (2)
1	For 1 st Year		12	
2	For 2 nd Year		12	
3	For 3 rd Year		12	
4	For 4 th Year		12	
5	For 5 th Year		12	
6	For 6 th Year		12	
7	For 7 th Year		12	
	Total (to Contractor's Electricity Payment – Schedule No. 5 Operation Services)			
	Name of Bidder			
	Signature of Bidder			

¹Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

Schedule 5.3.3: Contractor's Electricity Payment: Potable Water High Lift Pumps

Item	Description	Water production (forecast)	Proposed Power Consumption for Potable Water Pumps	Annual electricity consumption	CEB Tariff	Total Price ¹
		MLD	KwHrs per m ³	KwHrs	LKR / KwHrs	LKR
		(1)	(2)	(3) = (1)X(2)X1000X365	(4)	(3) X (4)
1	For 1 st Year	6			12	
2	For 2 nd Year	12			12	
3	For 3 rd Year	18			12	
4	For 4 th Year	24			12	
5	For 5 th Year	24			12	
6	For 6 th Year	24			12	
7	For 7 th Year	24			12	
Total (to Contractor's Electricity Payment – Schedule No. 5 Operation Services)						
Name of Bidder						
Signature of Bidder						

¹Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

Schedule 6: Asset Replacement Fund

Item	Description	Qty.	Unit Price per Annum ¹			Total Price ¹		
			Foreign Currency Portion	Local Currency Portion	Custom Duties	Foreign Currency Portion	Local Currency Portion	Custom Duties
			-----	LKR		-----	LKR	
		(1)	(2)	(3)		(1) x (2)	(1) x (3)	
1	For 5th Year							
1.1	List the items							
1.2	-----							
	Sub Total 1 (for 5th Year)							
2	For 6th Year							
2.1	List the items							
2.2	-----							
	Sub Total 2 (for 6th Year)							
3	For 7th Year							
3.1	List the items							
3.2	-----							
	Sub Total 3 (for 7th Year)							
4	For 1 Year after completion							
4.1	List the items							
4.2	-----							
	Sub Total 4 (for 1 Year after completion)							
	Total (Sub Total 1 + 2 + 3 + 4) (to Schedule No. 6 Grand Summary)							
	Name of Bidder							
	Signature of Bidder							

¹Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

Schedule No. 7. Grand Summary

Item	Description	Total Price ¹				
		Foreign Currency 1	Foreign Currency 2	Foreign Currency 3	Local Currency	Custom Duties
01	Total Schedule No. 1. Plant and Mandatory Spare Parts Supplied from Abroad					
02	Total Schedule No. 2. Plant and Mandatory Spare Parts Supplied from Within the Employer's Country					
03	Total Schedule No. 3. Design Services					
04	Total Schedule No. 4. Build Services (Summary)					
05	Total Schedule No. 5. Operation Service (Summary)					
06	Total Schedule No. 6. Asset Replacement Fund					
07	Sub Total -1					
08	Contingency (10%)					
09	Sub Total – 2 (Sub Total -1 + Contingency)					
10	Total Provisional Sum					
11	Grand Summary (Sub Total 2 + Provisional Sum)					
	VAT (15 %)					Nil
	Grand Summary + VAT					
	Name of Bidder					
	Signature of Bidder					

Tables of Adjustment Data

The adjustment data shall be applicable only in respect of Price Schedules 5 and 6 as per ITB 18.6.

Table A - Local Currency

Index Code	Index Description	Source of Index	Base Value and Date	Bidder's Local Currency Amount	Bidder's Proposed Weighting
	Nonadjustable	---	---	---	a: <u>0.15</u> b: _____ c: _____ d: _____ e: _____
Total					1.00

Table B - Foreign Currency

Name of Currency: _____

Index Code	Index Description	Source of Index	Base Value and Date	Bidder's Currency in Type/Amount	Equivalent in FC1	Bidder's Proposed Weighting
	Nonadjustable	---	---	---		a: <u>0.15</u> b: _____ c: _____ d: _____ e: _____
Total						1.00

- Note -

The base date shall be the date 28 days prior to the deadline for submission of the bid.

Tables of Adjustment Data shall only be included if prices are to be quoted as adjustable prices in accordance with ITB 18.6.

Section 5 - Eligible Countries

1.	AFG	Afghanistan	35.	FSM	Micronesia, Federal States of
2.	ARM	Armenia	36.	MON	Mongolia
3.	AUS	Australia	37.	MYA	Myanmar
4.	AUT	Austria	38.	NAU	Nauru, Republic of
5.	AZE	Azerbaijan	39.	NEP	Nepal
6.	BAN	Bangladesh	40.	NET	Netherlands
7.	BEL	Belgium	41.	NZL	New Zealand
8.	BHU	Bhutan	42.	NOR	Norway
9.	BRU	Brunei Darussalam	43.	PAK	Pakistan
10.	CAM	Cambodia	44.	PAL	Palau
11.	CAN	Canada	45.	PNG	Papua New Guinea
12.	PRC	China, People's Republic of	46.	PHI	Philippines
13.	COO	Cook Islands	47.	POR	Portugal
14.	DEN	Denmark	48.	SAM	Samoa
15.	FIJ	Fiji Islands	49.	SIN	Singapore
16.	FIN	Finland	50.	SOL	Solomon Islands
17.	FRA	France	51.	SPA	Spain
18.	GEO	Georgia	52.	SRI	Sri Lanka
19.	GER	Germany	53.	SWE	Sweden
20.	HKG	Hongkong, China	54.	SWI	Switzerland
21.	IND	India	55.	TAJ	Tajikistan
22.	INO	Indonesia	56.	TAP	Taipei,China
23.	IRE	Ireland	57.	THA	Thailand
24.	ITA	Italy	58.	TIM	Timor-Leste,
25.	JPN	Japan	59.	TON	Tonga
26.	KAZ	Kazakhstan	60.	TUR	Turkey
27.	KIR	Kiribati	61.	TKM	Turkmenistan
28.	KOR	Korea	62.	TUV	Tuvalu
29.	KGZ	Kyrgyz	63.	UKG	United Kingdom
30.	LAO	Lao People's Democratic Rep.	64.	USA	United States of America
31.	LUX	Luxemburg	65.	UZB	Uzbekistan
32.	MAL	Malaysia	66.	VAN	Vanuatu
33.	MLD	Maldives	67.	VIE	Vietnam
34.	RMI	Marshall Islands			

Section 6

Employer's Requirements

for

Design, Build and Operate (DBO) of a 24 MLD

Sea Water Reverse Osmosis (SWRO)

Desalination Plant at Thalaiyadi, Jaffna District,

Sri Lanka

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CHAPTER 1. INTRODUCTION

This Employer’s Requirements for Design, Build and Operate (“DBO”) services comprising engineering, procurement and construction (“EPC”) and Operation Service for the Jaffna Kilinochchi Water Supply and Sanitation Project (JKWSSP) - Seawater Reverse Osmosis (“SWRO”) Desalination Plant.

Terms used in this Employer’s Requirements will have the meanings given in the DBO Contract unless specifically defined otherwise in this document. The entity submitting binding offer is further referenced as “Bidder”. The Bidder who is awarded the contract for DBO services is named “Bidder” or “Contractor” throughout this document.

1.1 Project Background

The National Water Supply and Drainage Board (“NWSDB”) is the project developer and Employer of the Project (“Employer”). The Asian Development Bank (“ADB”) provides assistance to NWSDB with project development and funding.

All SWRO Desalination Plant structures, equipment, piping, utilities, seawater intake and outfall infrastructure, treated water storage system and other components of the JKWSSP SWRO Desalination Plant as well as of the potable water delivery system, which are included in the scope of work of this Project, are collectively referred to as “Works”.

The SWRO Desalination Plant site is located in a Greenfield site at Thalayaidai Village (Vadamaradchchi East Divisional Secretariat Division) in Jaffna District.

Once the SWRO Desalination Plant is constructed and commissioned, the Contractor shall provide full Operation Service of the SWRO Desalination Plant for a period of seven years in accordance with Chapter 16 of Employer’s Requirements and in accordance with the Conditions of Contract for Design, Build and Operate Projects (Gold Book) prepared by the Fédération Internationale des Ingénieurs-Conseil, (FIDIC) First Edition 2008.

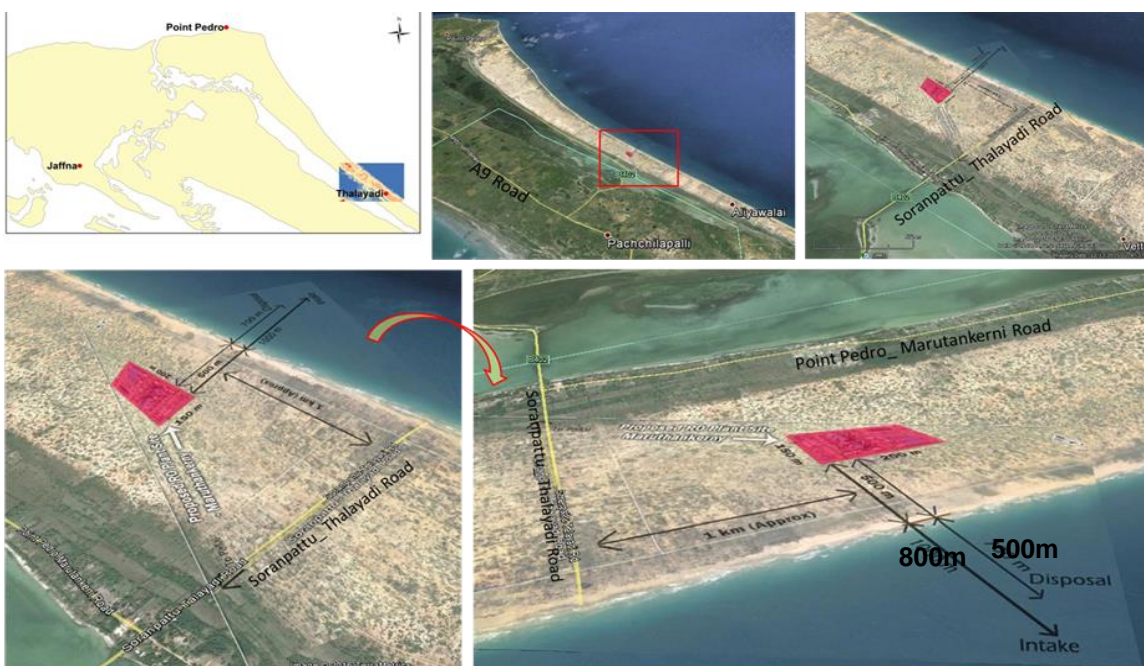


Figure 1.1: Location of SWRO Desalination Plant Site

1.2 Project Description

1.2.1 Plant Production Capacity

The JKWSSP SWRO Desalination Plant shall have a production capacity of 24 MLD (24,000 m³/day) of potable water from seawater.

To provide a flexible water supply, the plant should be designed to operate reliably and cost effectively at turn-down capacity of 6 MLD which is nominally 25 % of its design potable water production flow of 24 MLD. Under such minimum production capacity only one of four (4) seawater reverse osmosis (SWRO) desalination trains (racks) will be in operation. Each of the RO trains should be capable of operating efficiently at nominally 6 MLD of potable water production capacity and achieve highest efficiency and flexibility of operation at other capacities of 12 MLD, 18 MLD and 24 MLD of Potable Water. The proposed potable water requirement for first three years of Operation Service Period would be 6 MLD, 12 MLD and 18 MLD respectively and from the fourth year onwards 24 MLD.

The Contractor shall ensure that the potable water storage tank working capacity of 10 ML (10,000 m³) is considered in the sizing and design of the RO training cleaning system i.e. there should no net reduction in the SWRO Desalination Plant’s capability to export a net 24 MLD capacity, even when one RO train is being cleaned.

The plant production capacity availability factor for the SWRO Desalination Plant shall be no less than 96 % - i.e. the plant will produce potable water of at least 24 MLD for at least 350 days per year on a running annual average basis. The plant should be designed and operated such that the scheduled plant shutdown for the complete plant is minimized and all shutdown activities for individual (or groups of 6MLD trains) is completed within a maximum of 15 non-sequential days per year (up to 1.25 days per month of plant down time to accommodate planned maintenance activities) (see also 16.15.3). Contractor shall demonstrate this very important requirement throughout the 7-year Operation Service Period (which is part of this DBO Contract).

Sodium hypochlorite is to be used for disinfection and the control of biological growth throughout the plant. Chlorine gas is to be used for disinfecting the potable water.

1.2.2 Works Description

The Works, include the design, procurement, construction, installation and operation service of the SWRO Desalination Plant, pipelines, pump station and service facilities for delivery of potable water to the JKWSSP potable water distribution system at specific points designated by NWSDB (“Water Delivery Point”) and all associated permanent and temporary works to provide a fully functional, environmentally compliant and reliable facility over the entire Operation Service Period.

All piping and facilities to convey the potable water of the JKWSSP SWRO Desalination Plant beyond the boundary of the SWRO Desalination Plant site to designated delivery points shall be completed under this DBO contract and are included in the scope of work of the Contractor for this project. The potable water storage tank, pump station and conveyance facilities shall be handed over to the Employer’s Representative after issuance of Commissioning Certificate.

Design, construction, start-up and commissioning of the SWRO Desalination Plant shall be completed in accordance with prudent engineering practices using design and construction methods, technologies and criteria, which comply with all applicable codes and regulatory

requirements as well as contemporary industry practices. All activities associated with project implementation including plant design, site preparation, mobilization, construction, start up, and commissioning, shall be overseen by the Employer’s Representative.

Attachment 1 provides requirements for the useful life of key plant equipment. The Bidder shall submit a Preliminary Durability Plan in the tender submission detailing how they will select proven and reliable materials of construction showcasing a minimum 5 to 10-year track record of successful operation in SWRO Desalination plants. The successful Contractor will submit a final Durability Plan 1 month after contract commencement.

The type and quality of materials used for construction and for key equipment and piping shall be selected to achieve plant, structural and mechanical integrity, and performance for the full design life. All materials used for the construction of key SWRO Desalination Plant structures should be proven and reliable for use in seawater (or other chemical) environment to achieve highest plant availability and operational integrity.

Plant structure architecture, type and appearance should be designed to substantially conform to the requirements of NWSDB, local communities, the Environmental Impact Report requirements and applicable standards and regulations and for safe operation. All materials shall be new and meet required national and international standards (as appropriate). No old or reconditioned materials shall be used.

Materials as specified in Employer’s Requirements shall be inspected to ensure specified quality is achieved.

The Contractor’s Durability Plan is an important commitment from commencement through to the completion of the operation service period. The Bidder shall confirm that all process equipment will be procured by the Bidder from reputable manufacturers that have proven and reliable operating experience on at least one existing SWRO Desalination Plant. The reference shall be provided under Section 4 – Method Statement.

The SWRO Desalination Plant shall be constructed within the boundaries of the site and easements identified by the Employer (other than the seawater intake and outfall conduits/pipes, intake and outfall structures and the Potable water transmission pipeline).

The SWRO Desalination Plant will be constructed on a Greenfield site located in the Thalayadi Village (Vadamaradchchi East Divisional Secretariat Division) in Jaffna District. (Site depicted on Figure 1-2).



Figure 1.2 – SWRO Desalination Plant Site Location

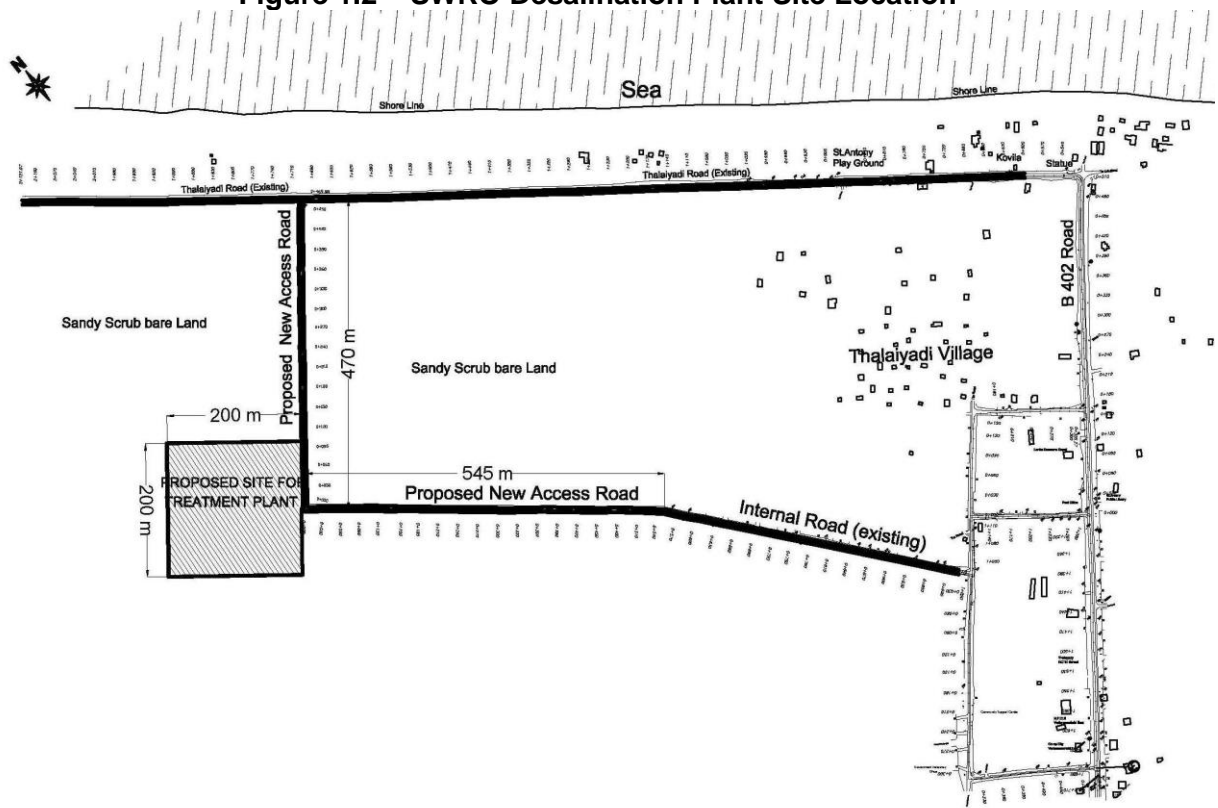


Figure 1.3 – SWRO Desalination Plant Site Location



Figure 1.4 – Potable Water Conveyance Route

This site is approximately 500m away from the ocean shore. At this distance, the site is in compliance with Sri Lanka's regulatory requirements for location of structures at least 300m from the shore in tsunami-prone coastal zones. In addition, the Contractor shall raise the level of the earthworks on the Proposed RO Plant Site to ensure that plant remains operational during heavy rain events – further details of this requirement is detailed in the Environmental Report – Refer Attachment 2.

The SWRO Desalination Plant shall use an ocean intake structure for source seawater collection located more than 800 meters from the shore and more than 1,300 meters from site boundary of the SWRO Desalination Plant.

To minimize environmental impacts from the plant discharge, the SWRO Desalination Plant should employ an offshore outfall arrangement (equipped with diffusers) for discharging brine concentrate and other side streams generated by the desalination process. The brine outfall structure shall be located more than 500 meters from the shore and more than 1,000 meters from the site boundary of the SWRO Desalination Plant.

The brine outfall arrangement and diffuser system shall be designed, constructed and operated to allow the discharge salinity to be dissipated rapidly and to reach ambient seawater levels in less than 50 meters from the point of discharge.

The design, supply and laying of potable water conveyance (approximately 8 km) shall include pipe network from SWRO Desalination Plant to Water Delivery Point at Puthukkadu Junction (Figure 1.4) and required pipework connections, air valves, scour valves, isolation valves, pipe supports, bridge crossings, recirculation lines, drains, vents, instrumentation and necessary works to ensure a functional and reliable system.

Attachment 2 of this document provides site information and other project information to facilitate design.

As a summary;

- The treatment plant site is 200m by 200m. For bidding purposes, it is to be assumed that the site is unencumbered with surface or buried structures.
- Distance from shore line (MWL):
 - Intake structure: 800m
 - Outfall diffuser: 500m
- Distance from seaward boundary of treatment plant site boundary:
 - Intake structure: 1,300m
 - Outfall diffuser: 1,000m
- The two pipes may be laid in a common trench providing at least one pipe diameter distance is maintained between the two pipes and the intake and diffusers are separated by at least 300m. Each pipe shall be a single pipe and together with its intake/outfall structure will be sized for the ultimate development of the plant (48 MLD production). The pipes shall be HDPE. The pump station shall be located at the SWRO plant site and may be wet or dry well.
- A plant availability of 96% has been set. The Bidder is to design, construct and operate a desalination plant to deliver this availability. This availability is tied to the first functional guarantee. In the design of the plant and the selection of equipment and materials, and the incorporation of backup systems, and the maintenance of the

plant and the availability of spares and the provision of competent staff, the Bidder is to assure itself that this availability will be achieved.

- The design, supply and laying of potable water conveyance
 - Length: approximately 8 km
 - Diameter of the Pipe: 800 mm
 - Pipe Material: DI
 - Lagoon Crossings: with pipe supports
 - Connection to the existing line at water delivery point by trenchless method (across A9 road)
- The Bidder is to draw the Employer's attention any requirement listed in Section 6 which may adversely affect the reliability.

1.3 Key Systems and Facilities

The SWRO Desalination Plant Works shall include (but not limited to) the following key systems and facilities:

1.3.1 Seawater Intake System

The Seawater Intake System shall be sized to cater for future expansion capacity of 48 MLD of Potable Water delivery and shall comprise:

- a) Offshore intake structure, grills and arrangements to minimize any adverse impact to local fishing community;
- b) Off-shore and on-shore pipework (conduit), civil and mechanical connections;
- c) Wet well, surge chamber;
- d) Intake screens, inlet isolation valves, mechanical screening equipment (rotating band screens) upstream of the intake pumps;
- e) Pump well with all required flood-prevention sumps & all required controls (wet or dry)
- f) Seawater intake pumps and reticulation pipework
- g) Intake system chemical dosing system (dual redundant (duty / standby)
- h) Electrical works, transformers, switchgear, earthing, lighting and all required electrical control and protection system;
- i) Earthwork, piling, foundations, temporary and permanent works to achieve environmental, social and community obligations.
- j) Local control panel, interface with the plant control system;
- k) Instrumentation including the following:
 - i. Silt Density Index (SDI2.5);
 - ii. Turbidity;
 - iii. Total Organic Carbon (TOC);
 - iv. Total Suspended Solids (TSS);
 - v. Algal Content Expressed as Algae Concentration of Chlorophyll;
 - vi. Parameters listed in the Seawater Intake Quality specifications
 - vii. Total Hydrocarbons
 - viii. Protection system to trigger shutdown of the intake pump station should the values exceed unacceptable level;
- l) Intake pump station building with HVAC, maintenance crane, access stairs, personnel lift, sump pump;
- m) Equipment shall provide to monitor the biological growth within the intake pipe and intake structure.
- n) Any other equipment to achieve SWRO Desalination Plant availability, guaranteed performance, operational flexibility and durability (and service life) of the asset.

- o) Provision needs to be made for safe access to the pipeline for inspection and maintenance purposes.
- p) A surface marker buoy is to be anchored at the place of Intake.

1.3.2 Pre-Treatment System

The Contractor shall supply, install, commission and operate a Pre-Treatment System sized to supply a reverse osmosis system with a capacity of 24 MLD of potable water. The pre-treatment system will:

- a) Remove suspended and settleable colloids and particles;
- b) Achieve a pre-treatment product water quality as defined in Table 6-2;

The contractor shall configure the pre-treatment system using unit operations listed in Table 6-1. The Contractor will include space and hydraulic capacity for the future installation of pre-treatment equipment to remove algae and allow for uninterrupted operation of the reverse osmosis system during algal bloom events in the water located above and around the intake structure.

Other components of the pre-treatment system include;

- a) All pumps and recirculation pipework
- b) Backwash and clean-in-place system, waste and drains collection, storage and pumping;
- c) Provision to prevent contamination of treated seawater from airborne particles;
- d) Electrical works, transformers, switchgear, earthing, lighting and all required electrical control and protection system;
- e) Local control panel, interface with the plant control system;
- f) Instrumentation including the following to monitor seawater quality at the entrance to the pre-treatment system:
 - i. Flow;
 - ii. Turbidity;
 - iii. pH;
 - iv. Conductivity;
 - v. Temperature;
 - vi. Chlorine residual (and ORP);
 - vii. Dissolved oxygen.
 - viii. any other instrument required to meet Environmental approvals
- g) Building for filters and membranes with HVAC, maintenance crane, access, sump pump (Note dissolved air floatation may be located outside area served by HVAC);
- h) Safe shut-down and safety system;
- i) Earthwork, piling, foundations, temporary and permanent works;
- j) Environmental controls;
- k) Floor space in the layout for future installation of an additional Pre-treatment system to cater for 48 MLD Expansion Works;
- l) Any other equipment to achieve SWRO Desalination Plant availability, guaranteed performance, operational flexibility and durability (and service life) of the asset;
- m) Safe and adequate access by operators and maintenance personnel must be available to all instruments, sampling points, manually operated fittings, change out equipment, joints and mechanical equipment such as pumps and valves for the purposes of inspection, maintenance and replacement. Where appropriate (such as ladders, walkways and platforms) access must comply with relevant National Standards;

1.3.3 Reverse Osmosis System

The Reverse Osmosis (RO) System shall be sized for 24 MLD Potable Water plant and shall comprise:

- a) RO Feed Water Conditioning Facilities and Instrumentation and Controls to Protect the Integrity and Useful Life of the RO Membranes;
- b) RO Membrane Trains (incorporating high pressure pumps, pipework, valves and manifolds);
- c) Membrane cleaning system;
- d) Membrane flushing system;
- e) Isobaric Pressure-exchanger type Energy Recovery System and all required controls and protection;
- f) Interface with and connections to the Post-treatment system and other systems;
- g) Drains and waste collection, storage and conveyancing system;
- h) Electrical works, transformers, switchgear, earthing, lighting and all required electrical control and protection system;
- i) Local control panel, interface with the plant control system;
- j) Instrumentation including the following to monitor seawater quality leaving the pre-treatment system;
 - i. Turbidity;
 - ii. pH;
 - iii. Chlorine residual;
 - iv. Conductivity;
 - v. SDI;
 - vi. ORP;
 - vii. Boron;
 - viii. Any other instrument required to provide Operator information and plant control;
- k) Building with HVAC, maintenance crane, access, sump pump;
- l) Safe shut-down and safety system;
- m) Earthwork, piling, foundations, temporary and permanent works;
- n) Environmental controls;
- o) Floor space and associated provisions such as plinths or embedded conduits in the layout to cater for future installation of plant expansion i.e. second stage of 24 MLD to reach (future) 48 MLD Plant capacity;
- p) Floor space to install 2nd stage of RO membranes for (possible) Boron reduction in the future (enough membranes to reduce Boron from 2.4 mg/l to 1 mg/l);
- q) Any other equipment to achieve SWRO Desalination Plant availability, guaranteed performance, operational flexibility, safety and durability (and service life) of the asset;

1.3.4 Potable Water Post-Treatment System

The Potable Water Post-Treatment System shall be sized for 24 MLD Potable Water plant and comprise:

- a) Re-mineralization system incorporating lime and carbon dioxide or calcite and carbon dioxide (or sulphuric acid) dosing system;
- b) Disinfection system incorporating chlorine gas dosing system;
- c) Interface with and connections to the Reverse Osmosis Plant and the Potable Water storage and transmission systems;
- d) Drains and waste collection, storage and conveyancing system;
- e) Electrical works, transformers, switchgear, earthing, lighting and all required electrical control and protection system;
- f) Local control panel, interface with the plant control system;

- g) Instrumentation including the following to monitor the water quality:
 - i. Turbidity;
 - ii. Conductivity;
 - iii. Temperature;
 - iv. pH;
 - v. Boron;
 - vi. Any other instrument required to provide operational flexibility for the post-treatment system;
- h) Building with HVAC, maintenance crane, access, sump pump;
- i) Safe shut-down and safety system;
- j) Earthwork, piling, foundations, temporary and permanent works;
- k) Environmental controls;
- l) Floor space and associated provisions such as plinths or embedded conduits to add additional post-treatment equipment to expand Plant capacity from 24 MLD to 48 MLD in the future and floor space and pipeline connections blank ended for future installation of Ultra-violet (UV) treatment stage;
- m) Any other equipment to achieve SWRO Desalination Plant availability, guaranteed performance, operational flexibility and durability (and service life) of the asset;
- n) Safe and adequate access by operators and maintenance personnel must be available to all instruments, sampling points, manually operated fittings, change out equipment, joints and mechanical equipment such as pumps and valves for the purposes of inspection, maintenance and replacement. Where appropriate (such as ladders, walkways and platforms) access must comply with relevant National Standards;

1.3.5 Potable Water Storage and Conveyance System

The Potable Water Conveyance System comprises a storage tank, a pump station and a pipe line as follows;

- a) One above-ground reinforced concrete potable water storage tank of working capacity of 10 ML;
- b) On-site Pump station building with all required facilities to install 2 X 6 MLD and 3 x 12 MLD high-lift pumps (only 2 X 6 MLD and 2 x 12 MLD Pumps shall be installed initially);
- c) 2 X 6 MLD and 2 x 12 MLD Pumps
- d) Suction and delivery pipework for 2 X 6 MLD and 3 x 12 MLD
- e) Potable water transmission pipe line (8 kilometres long, 800 mm diameter, ductile iron material and 36 MLD transfer capacity) from the potable water storage tank to the delivery point tank, 3 x in-line isolation valves and valve pits;
- f) Pipeline surge control devices capable of limiting surge pressure to within the maximum design pressure of the entire Potable Water system;
- g) All required pipework connections, air valves, scour valves, pipe supports, bridge crossings, recirculation lines, drains, vents, instrumentation and necessary works to ensure a functional and reliable system;
- h) Interface with and connections to the 10 ML Storage Tank and Post-treatment facility;
- i) Drains and waste collection, storage and conveyancing system;
- j) Electrical works, transformers, switchgear, earthing, lighting and all required electrical control and protection system;
- k) Local control panel, interface with the plant control system;
- l) Instrumentation including the following to monitor Potable Water Quality:
 - i. Turbidity;
 - ii. Conductivity;
 - iii. pH;

- iv. Chlorine residual;
- v. Boron;
- vi. Any other instrument required to measure critical Water Quality Parameters and ensure public health;
- m) Building with HVAC, maintenance crane, access, sump pump;
- n) Safe shut-down and safety system;
- o) Earthwork, piling, foundations, temporary and permanent works;
- p) Environmental controls;
- q) Floor space and pipeline connections blank ended for installation of additional equipment to reach 48 MLD capacity;
- r) Any other equipment to achieve SWRO Desalination Plant availability, guaranteed performance, operational flexibility and durability (and service life) of the asset;
- s) Cathodic Protection must be provided to all metal pipelines and tanks using either suppressed current or sacrificial anodes. Suppressed current systems must be connected to the SCADA system;
- t) Instrumentation including the following to monitor Potable Water Quantity: Flow and Pressure monitors connected to the SCADA system at the beginning and end of the transmission line;

The potable water storage tank, pump station and conveyance facilities shall be handed over to the Employer’s Representative after issuance of Commissioning Certificate.

1.3.6 Concentrate and other Waste Discharge Facilities

The Concentrate and other Waste Discharge Facilities shall be sized 48 MLD Plant capacity including the Waste Retention Tank (see below) and shall comprise the following:

- a) Concentrate discharge system including outfall pipework, valves, offshore structure, diffuser pipe and diffusers;
- b) Waste Retention Tank sized for 2 hours’ waste streams based on future 48 MLD capacity;
- c) Integrated system for accepting drains and waste streams from the entire SWRO Desalination Plant to the Discharge Retention Tank;
- d) Pump station building, pumps, suction and delivery pipework, full-flow recirculation line back to the discharge retention tank;
- e) All required interconnecting pipework, valves, drains, vents, instrumentation and necessary works to ensure a functional and reliable system;
- f) Interface with and connections to the other systems;
- g) Overflow and drains collection, storage and conveyancing;
- h) Discharge tank mixing and pH correction (neutralization system);
- i) Electrical works, transformers, switchgear, earthing, lighting and all required electrical control and protection system;
- j) Local control panel, interface with the plant control system;
- k) Instrumentation including the following to monitor waste water quality – before discharge to the brine concentrate system;
 - i. Conductivity;
 - ii. Change flow rate;
 - iii. Temperature;
 - iv. pH;
 - v. Dissolved oxygen;
 - vi. Turbidity;
 - vii. Chlorine residual or ORP equivalent;
 - viii. Any other measurement required by the Environmental Approval to ensure there will be no harm to the marine environment;

- l) Building with HVAC, maintenance crane, access, drains sump pump;
- m) Safe shut-down and safety system;
- n) Earthwork, piling, foundations, marine/dredging, pipe laying, rock armour, temporary and permanent works;
- o) Environmental controls, instrumentation and monitoring;
- p) Diffuser arrangement with smooth contours to mitigate adverse impacts to local fishing community;
- q) Marine exclusion zone marker buoys (temporary and permanent facilities) and marine monitoring devices;
- r) Any required equipment or controls such that there is no limitation if the SWRO Desalination Plant is operated at turn-down capacity of 6 MLD (or combination of 6 MLD trains);
- s) Any other equipment to achieve SWRO Desalination Plant availability, environmental performance commitment, operational performance, flexibility and plant durability (and service life);
- t) Safe and adequate access by operators and maintenance personnel must be available to all instruments, sampling points, manually operated fittings, change out equipment, joints and mechanical equipment such as pumps and valves for the purposes of inspection, maintenance and replacement. Where appropriate (such as ladders, walkways and platforms) access must comply with relevant National Standards;
- u) A surface marker buoy is to be anchored at the place of the diffusers;

1.3.7 General Site Service Facilities

The General Site Service Facilities shall be sized for 24 MLD Potable Water Plant and shall comprise the following:

- a) Plant and Equipment Buildings, Civil Works and Foundations for each of all of the systems as noted above;
- b) Administration building and facilities including minimum specified floor areas (refer Chapter 11, Employer’s Requirements);
- c) Paved areas, parking facilities, hard-stands, site roads;
- d) All required building utilities, facilities, locker rooms, shower, toilets, plumbing, valves, drains, vents, instrumentation and necessary works to ensure a functional and reliable building;
- e) Workshop facility along with special tools and equipment required for plant maintenance;
- f) Suitable storage for spares with storage racks and forklift access;
- g) Suitable air-conditioned and heat-alarmed fire-proof room to securely house computer and communication equipment and with fire suppression system;
- h) Maintenance access doors and craneage;
- i) Electrical works, transformers, switchgear include MCCB, MCB, RCB and isolating switches, earthing, lighting, cabling, cable trenches, cable management system;
- j) Building Fire and Alarm system, local control panel, interface with the plant control system;
- k) Earthwork, piling, foundations, temporary and permanent works;
- l) Storm water management system draining to a single site discharge point, storm water basins, site-wide sump pumps and pipework;
- m) Construction facilities, laydown areas, access and road improvements, temporary and permanent storm water and other drainage works;
- n) All required temporary and permanent housing facilities for site works, construction, commissioning, operations and maintenance staff and sub-contractors;
- o) HVAC, access stairs, fire doors and other building facilities;

- p) Floor space and tapping connections for easy interconnection such that future expansion from 24 MLD to 48 MLD Potable Water capacity can be achieved without shut-down of the plant;
- q) Landscaping and irrigation facilities;
- r) Environmental controls;
- s) Any other facilities required to achieve SWRO Desalination Plant operational flexibility and durability (and service life);
- t) CCTV coverage of the site is to be provided and connected to screens in the control room with 7 days’ storage capacity of video data.
- u) Site Access (Refer to Figure 1.3): The contractor shall establish new access roads (shown in Attachment A.2.1.b) to the SWRO Plant site in accordance with Section 3.7.10 Roadways. Further the Contractor shall establish a permanent access road to the site from the B402. In addition, the Contractor is likely to use the A9 (Class A road) and B402 (Class B road) to bring in equipment and materials to the site. The Contractor is responsible for ensure the integrity of the B402 and the waterway crossings (culverts) along the route before using the road and to repair any damages to this road caused by the Contractor’s and Sub contractors’ vehicles. The Contractor shall have access to the land to construct the new road and will have use of the B402. Both are public spaces.

1.3.8 Ancillary and Support Services

The Ancillary and Support Services shall be sized for 24 MLD Potable Water plant capacity and shall comprise the following:

- a) Service Air system;
- b) Instrument Air system;
- c) Fire Detection, Fire Alarm, Fire Protection and Fire Fighting system;
- d) Chemical Unloading, Storage, Handling, Metering, Mixing, Injection and Distribution systems and controls;
- e) Potable Water system for use in the Plant;
- f) Service Water system;
- g) General Site Services, Utilities, Safety Showers system;
- h) Membrane Flush system;
- i) Manual sample system and sampling points must be located at the following locations;
 - i. Seawater pump discharge;
 - ii. Inlet to pre-treatment facilities;
 - iii. Inlet to Reverse Osmosis process (outlet from the pre-treatment facilities);
 - iv. Permeate from each RO train;
 - v. Brine concentrate from each RO train;
 - vi. Potable Water prior to entry to the Potable Water Storage Tank;
 - vii. Potable Water at the outlet of the Potable Water Storage Tank;
 - viii. Potable Water at just before the Delivery Point;
 - ix. Five (5) additional sampling points;
- j) Fuel filling arrangement on site;
- k) Site Security, site fencing, plant roads and access control system, plant and building access control system;
- l) Fire detection and protection system, very early smoke detection and alarm system, firefighting system including fire water storage tank, fire hydrants and potable fire extinguishers throughout the site;

- m) Electrical works, transformers, switchgear, earthing, lighting and all required electrical control and protection system;
- n) Building HVAC, access stairs, fire doors and other building facilities;
- o) Earthwork, piling, foundations, temporary and permanent works;
- p) Floor space for installation of additional equipment to change from 24 MLD to 48 MLD Potable Water capacity plant;
- q) Environmental controls;
- r) Any other facility required to achieve SWRO Desalination Plant availability, guaranteed performance, operational flexibility and durability (and service life) of the asset;
- s) Adequate access must be made for chemical deliveries with tanker connection points located within bunds, and delivery locations comprising concreted areas sufficient to cover an entire tanker and draining to a sump which is connected to a neutralisation tank

1.3.9 Instrumentation and Controls

The Instrumentation and Control System shall cater for 48 MLD Capacity for systems that are sized for 48 MLD Capacity and cater for 24 MLD Capacity for systems that are sized for 24 MLD Capacity and shall comprise:

- a) Plant Control System incorporating Supervisory Control and Data Acquisition (SCADA), Programmable Logic Controllers (PLCs) and integrated system through internet;
- b) Plant instruments, control elements and remote equipment;
- c) Shielded data highway (including dual-redundant fibre loop) connecting all plant items;
- d) Engineer and Operator workstations and a Control Desk with a Mimic and HMI Panel for Operator information;
- e) All required hardware, servers, software, redundancy;
- f) Local control panels, emergency stop devices, hard-wired controls and interface terminals;
- g) Alarm management system and reporting system;
- h) Instrumentation cabling and segregation with power supply system;
- i) Secure power supplies and dual-redundant UPS system;
- j) Remote communications facilities and integration;
- k) Plant communication system, CCTV and cameras, electronic security / access control system;
- l) Interface with Employer's system;
- m) Redundancy and other features required to ensure SWRO Desalination Plant availability, guaranteed performance, operational control and operational flexibility.

1.3.10 Electrical Supply System

The Electrical Supply System shall be sized for 48 MLD Plant Capacity for transmission lines and up to the inlet to the step-down transformer and shall comprise:

- a) Power supply infrastructure, Electrical Substation, step-down transformers, electrical isolation (breakers), cabling, bus ducts or any required connection to the Power Grid of Ceylon Electricity Board;
- b) Two 100%-load 33 kV electrical conduits provided for the desalination plant electrical system with the 1.1 kV electrical switchgear of the SWRO desalination plant and facilities for interconnecting to the SWRO Desalination Plant electrical system
- c) Electrical switchgear, motor control centre, electrical isolation (circuit breakers), cabling, cable management system, cable trenches, cable draw-pits, conduits;

- d) Construction required by the Contractor including Substation and Connection to the Power Grid of Ceylon Electricity Board;
- e) Variable Frequency Drives and Motor Control Centres (MCCs);
- f) Electrical Generators, power management system including plant shut-down system;
- g) Cable management system, cable pits, cable trenches, cable supports, cable terminations and cable segregation;
- h) Fire and smoke detection and protection system for the electrical switch rooms, transformer areas and associated works;
- i) Space provision to install additional step-down transformers to support expansion to 48 MLD Plant Capacity (in the future);
- j) A diesel generator of sufficient size to power the controlled shutdown of the plant in the event of a complete power outage is to be provided (contractor to price in bid);
- k) A diesel generator of sufficient power to operate one of the 6 MLD trains and upstream and downstream supply systems is to be designed and costed (a provisional sum has been made for this)
- l) Arrangement to measure the power consumption of RO system, high lift Potable Water Pumps and Area Lighting and Administration Building separately;

Important Note:

The Ceylon Electricity Board (CEB) is the nominated service provider and Contractor is expected to liaise with CEB and include all required is expected works to provide a functional and high reliability electrical supply.

1.4 Mandatory Spare Parts

Refer 1.7.

1.5 Guarantees and Plant Performance

1.5.1 Schedule of Guarantees

The Contractor shall ensure that the SWRO Desalination Plant meets, as a minimum, guarantees for the following parameters as part of Acceptance Tests as well as during the 7-year DBO Contract:

- a) Potable Water Production Quantity for each train as well as the complete plant;
- b) Potable Water Production Quality for each train as well as the complete plant;
- c) Energy efficiency of the SWRO Desalination Plant (excluding the high lift Potable Water Pumps, Area Lighting and Administration Building);
- d) The total leakage of water within the facility shall be nil.

1.5.2 Other Plant Performance Requirements

In addition to the above Guarantees, the Contractor shall also demonstrate the following additional plant performance requirements (as part of Acceptance Tests and each year, during the 7-year DBO Contract):

- a) The Chemicals usage for each of the 6 MLD train and the full plant;
- b) Pressure loss through the cartridge filters;
- c) the cost of replacing membranes that are under five years will be borne by the Contractor;
- d) Plant arrangement is suitable for future expansion to 48 MLD of Potable Water;
- e) Plant arrangement is suitable for future second pass membranes for Boron reduction;
- f) Quality and reliability of the energy recovery devices;

- g) Overall plant availability in excess of 96%;
- h) Outfall diffuser performance to meet the Environmental Approval conditions; including the dispersal requirements of this contract;
- i) Other stakeholder, social and community obligations and key performance outcomes to be delivered

1.6 Operation Service

1.6.1 Operation Management Requirements

The Contractor shall provide full Operation Service of all SWRO Desalination Plant to satisfy the Works performance standards and in accordance with the Operation Management Requirements as detailed further in Chapter 16 of Employer’s Requirements.

All Operation Service shall be performed in accordance with legal and statutory requirements in Sri Lanka, meet Employer’s requirements and meet prudent industry practice standards and will include, but not be limited to:

- a) Operating and maintaining (to include repair and replacement) the Works, including meeting the water quality and quantity obligations and conformance to the agreed dispatch protocol. The Contractor shall be responsible for purchasing the necessary chemicals, membranes and other consumables required to achieve plant operation;
- b) Providing an annual operating plan; to be approved by the Employer’s Representative;
- c) Providing an annual preventative and responsive maintenance and asset condition monitoring plan; to be approved by the Employer’s Representative;
- d) Determining appropriate staffing levels and maintaining these levels with competent staff;
- e) Maintaining comprehensive records relating to Works performance;
- f) Providing monthly reports and invoices to Employer and additional reports as may be reasonably required;
- g) Conducting appropriate inspections and making the Works available for inspections by Employer, Auditor, Lenders, Employer’s authorized representatives or agents and water customers;
- h) Obtaining and maintaining water, sewer, electricity and telecommunications services;
- i) Developing, implementing and enforcing of programs for safety, quality assurance and quality control;
- j) Disposing appropriately of all commissioning water, discharge water and concentrate, and other waste, including without limitation, wastewater and spent chemicals including in compliance with the EIA;
- k) Complying with all permits and Governmental approvals related to Works operation;
- l) Making its personnel available during the design, procurement, construction and commissioning phase to ensure plant will meet long-term durability;
- m) Ensuring Contractor’s key Operation Service Leadership Team is available from the commencement of the DBO Contract and all Operators and staff are fully trained and available at least one (1) month before commencement of Commissioning;
- n) Supporting Employer for maintaining good relationships with water customers, Authorities and public (including tours, community relations programs, etc.).
- o) Operating the Works in such a manner commensurate with contemporary practices and the ISO Quality, Environmental and Safety standards;
- p) Cleaning up and disposing of any chemical spills in accordance with National environmental standards and/or the environmental approvals for this site;
- q) Carrying out the services in a safe manner that protects the health and safety of all site personnel and people near the site

1.7 Inventory Items and Mandatory Spares

1.7.1 Descriptions

Inventory items have been classified as follows:

- Critical Spares
- Non-Critical Spares
- Consumables

Other related matters are:

- Warrantied Items
- Asset Replacement Fund Items
- Damaged Items

The plant is required to achieve a 96% reliability. If the failure of a part would impact on achieving this reliability, then that part is considered a ‘Critical Spare’. Critical Spares must be available in such numbers as to ensure the 96% reliability is achieved.

If the failure of a part did not impact on the plant achieving this reliability, then the part is considered a Non-Critical Spare. A failure in a Non-Critical Spare may, however have other consequences, such as an adverse impact on safety, disruption to the overall functioning or efficiency of the plant, result in a social or environmental non-compliance or adversely affect the operator’s reputation. Some Non-Critical Spares therefore play an important part in the inventory of the plant and must be stocked as a mitigation measure to any of the above impacts.

Materials are used in the daily maintenance of equipment, such as the replacement of a gasket. These are considered to be ‘consumables’, and while being kept in an inventory are not considered spares. Consumables are also known as ‘sub-assembly parts’.

Warrantied Items are any item that comes with a manufacturer’s warranty. Warrantied items are not to be included in the Asset Replacement Fund for the term of their warranty, but may be included thereafter. The contractor is to seek redress from a manufacturer for any warrantied items that malfunction due to a manufacturing fault.

Asset Replacement Fund Items are any item that has a nominated asset life greater than or equal to five years and less than or equal to the Operation Service Period. The Asset Replacement Fund is intended to establish sufficient funds to replace all assets as they reach the end of their nominated lives within this window.

Damaged Items are those items which become impaired as the result of an act or omission of the contractor, whether intended or unintended. The contractor is to cover the cost of the repair or replacement of damaged items.

Mandatory Spares

A Mandatory Spare is defined as the Critical Spare or a Non-Critical Spare where the failure of a part would result in a breach of the Contractor’s social or environmental requirements. Referring to Table 3-3 in Section three this is equivalent to not satisfying:

- Functional Requirement: Produce Water – Quantity and Quality – Items 1 to 6
- Management Requirement: Practise Project Management – Items 5 and 6

1.7.2 Operation Service Spares for 7-years

The Contractor shall provide mandatory spares for all Systems and Facilities identified above including the following:

- a) Contractor shall provide Operation Service spares during the 7-year Operation Service Period and a further period of 1 year (after the completion of the 7-year Operation Service Period);
- b) All spares shall be handed over to the Employer as free-issue at the time of acceptance testing towards the end of the 7-year Operation Service Period;
- c) The assets with the life expectancy of less than five years are not eligible for replacement through the asset replacement fund;
- d) An inventory of spares is to be maintained throughout the Operation Service Period.

1.7.3 Critical Items

The Contractor shall identify and provide any Critical Items. Critical Items are those items required to ensure the meeting of the delivery requirements for the water. Failure of a critical item would cause a significant disruption to the operation of the works. Critical Items must be help in store on site, and immediately restocked when used.

CHAPTER 2. WATER CHARACTERISTICS

2.1 Intake Water Quantity and Quality

2.1.1 Key Design Parameters

The intake source seawater system shall be designed & constructed by the Contractor based on overall seawater recovery of 45% and ultimate plant Potable Water capacity of 48 MLD.

Recovery

The recovery rate from the RO has been listed as 45%. If the Bidder provides a Plant recovery that is higher, this will leave some buffer capacity. If the offered plant recovery is lower than 45%, the Bidder shall explain reasons for the lower recovery (without compromising on energy efficiency) and shall design the intake system to cater appropriately.

Raw Water Quality

The SWRO Desalination Plant design shall be based on Intake Seawater Quality Specification presented in Tables 2-1 and 2-2.

The Contractor shall design the SWRO Desalination plant so that it can continue to operate satisfactorily for the full range (Average, Maximum and Minimum) of parameters noted in Table 2-1 and Table 2.2 (below) over and above any other parameters that the Contractor may have identified as part of its due diligence.

Upon commencement of the DBO Contract and no later than 30-days thereafter the Contractor shall prepare influent water quality testing procedure and commence the water quality analysis by taking regular daily samples of the seawater from the area adjacent to the proposed seawater intake. This shall continue up to completion of design phase and weekly water quality analysis shall continue up to successful commissioning of the plant.

This is to ensure that the Contractor has sufficient and more reliable baseline data on the raw seawater variability and can utilize this information to further optimize and refine the SWRO Desalination Plant design, procurement, construction and commissioning and ensure the plant equipment is resilient and can cater to the variations in seawater quality.

Influent water quality testing and analysis shall be completed using mutually acceptable methodology and protocol sampling and analytical methods approved by the Employer.

The contractor is required to satisfy itself that it fully understands and allows for the water intake quality and the variations in this water intake quality, and to take all necessary steps to gain this understanding.

**Table 2-1
Intake Seawater Quality Specifications – Minerals**

Water Quality Parameter	Concentration (mg/L)
Calcium	338
Magnesium	1,720
Sodium	8,738.4
Potassium	600
Boron	4.5
Bromide	73
Bicarbonate	170
Sulphate	2,572
Chloride	17,934
Fluoride	2.1
Nitrate	18.0
Silica	5
TDS (mg/L)	32,170

**Table 2-2
Intake Seawater Quality Specifications – Water Quality**

Parameter	Average	Maximum	Minimum
Total Dissolved Solids, mg/L	32,500	35,000	30,000
Conductivity, mS/cm	50,266	53,500	46,875
Temperature, °C	29.0	30.6	24.0
Turbidity, NTU	1.0	25.0	0.3
Total Suspended Solids (TSS), mg/L	8.0	30.0	1.0
SDI₅	14.7	17.7	8.1
Oxidation Reduction Potential, mV	148	152	144
Chlorophyll a, µg/L	1.5	2.13	1.1
Total Organic Carbon (TOC), mg/L	1.3	6.0	0.5
pH, Units	7.5	7.8	7.4
Total Hydrocarbons, mg/L	Non-detectible	Non-detectible	Non-detectible
NO₃/ Phosphates, mg/L	18.0/3.20	35/10	5/5
Volatile Organic Compounds	Non-detectible	Non-detectible	Non-detectible
Faecal Coliforms, cfu/100 ml	Non-detectible	Non-detectible	Non-detectible
Total Coliforms, cfu/100 ml	Non-detectible	Non-detectible	Non-detectible
E. Coli, cfu/100 ml	Non-detectible	Non-detectible	Non-detectible
Heterotrophic Plate Count, cfu/100 ml	Non-detectible	Non-detectible	Non-detectible

2.1.2 Special Considerations

Bidder shall note that based on preliminary analysis of the site-specific conditions of the selected JKWSSP SWRO Desalination Plant, the source seawater intake water quality is also impacted by the following event:

- a) Heavy Rains During the Monsoon Season;

Except for an Exceptional Event the Bidder shall design the SWRO Desalination Plant to be able to accommodate these seawater excursions and events without interruption of SWRO plant operations and without reduction in Potable Water production capacity of minimum 24 MLD. The frequency and potential impact of this event on the plant source seawater quality is discussed below.

2.1.2.1 Algal Bloom /Red Tide Events

Deleted

2.1.2.2 Surface Water Runoff during the Monsoon Season

During heavy rain events of the monsoon season the SWRO Desalination Plant intake will be influenced by surface runoff water delivered to the intake area with the near-shore winds, currents and tides. The SWRO Desalination Plant site is located near agricultural lands and residential settlements, which are likely to cause anthropogenic contamination. The main anthropogenic contaminants that could reach the plant’ intakes are fertilizers, raw wastewater from flooded and inundated latrines and septic pits; heavy metals, oil and grease from parking areas, and pathogens. While the water quality data collected to date do not point out to hydrocarbon contamination, SWRO Desalination Plant source water could potentially contain hydrocarbons originating from latrine/septic tank discharges or from surface runoff.

Because of the potential for contamination of the SWRO Desalination Plant source water by anthropogenic sources containing hydrocarbons, heavy metals and organics, the SWRO Desalination Plant pre-treatment system should be designed to monitor and handle such contamination. The data collected to date indicate that such contamination is limited. However, the design of the SWRO Desalination Plant shall cater for such events without damage to the plant. Regular monitoring of source water quality for hydrocarbons during the monsoon season should take place to prevent accidental hydrocarbon contamination from malfunctioning latrines, septic pits, agricultural equipment, and surface runoff.

The above Water Quality Parameters are currently indicated as Non-detectible in the Table 2-2, however the Contractor shall implement a monitoring regime throughout the design and construction period and if any excursions are found outside of the Maximum or Minimum values in Table 2-2 the Contractor shall implement additional controls in the design, procurement and construction – so that commissioning or operation is not adversely impacted. Bidder shall also notify the Employer immediately if any excursions are found.

The Contractor is also required to take reasonable steps to prevent any airborne matter entering the plants treatment systems.

2.1.2.3 Tsunamis

Tsunamis are considered as Exceptional Events.

2.2 Pre-treatment Water Quality

Pre-treatment system shall ensure that the Pre-treatment Filtrate meets the minimum water quality noted in Table 2-3 (below) and meets the RO membrane manufacturer’s warranty requirements for membrane performance (quality and quantity) as well as design life and durability.

Table 2-3

Minimum Pre-treatment Filtrate Water Quality Requirements

Parameters	Concentrations/Levels	Units
Turbidity (daily avg./max)	Granular Media Filters May never exceed 1 NTU, and must not exceed 0.3 NTU in 90% of daily samples in any month Membrane Filters May never exceed 0.5 NTU, and must not exceed 0.2 NTU in 90% of daily samples in any month	NTU
Silt Density Index (SDI ₁₅)	< 3 (90% time) Never exceed 4.0	
Total Organic Carbon	< 1.0	mg/L
pH (min)/(max)	4.0/9.0	pH Units
Oxidation Reduction Potential (ORP)	Less than 250	mV
Chlorine Residual	≤ 0.02	mg/L
Total Hydrocarbons	≤ 0.04	mg/L

The Contractor shall design, procure, construct and operate the pre-treatment system to provide:

- a) A filtered seawater to the RO membranes of a quality that fully complies with the membrane manufacturer’ requirements, minimises organic and biological fouling and which satisfies ongoing performance guarantees for the plant;

- b) The required rate of flow, uninterrupted during backwash operations, necessary for operations, over the operational lifetime of SWRO Desalination Plant in accordance with equipment manufacturers’ requirements;
- c) A backwash water flow for any media filter to maintain a consistent filter-bed operation;
- d) An arrangement that prevents growth of sunlight-induced biological matter whilst ensuring good access for inspection and maintenance purposes;
- e) Protection to the RO Membranes from unacceptably high suspended solids loads by including cartridge filters or alternative fine filtration method sized generously to ensure low pressure drop;
- f) Integration with a clean-in-place system (as required and in compliance with manufactures recommendations) to condition and maintain system and prevent build-up of excessive fouling and head loss. It must also integrate with an automated waste neutralization and storage prior to disposal in accordance with environmental standards and/or the approved project environmental plan;
- g) Arrangement that prevent contamination of treated seawater from airborne particles;
- h) Arrangement that will ensure safe shut-down and safety system to prevent harmful chemicals from damaging the membranes or the environment;

2.3 Potable Water Quality

The SWRO Desalination Plant shall be designed to produce water of quality compliant with the requirements of Table 2-4.

Such requirements are described in Attachment 3 – Water Quality Requirements and Conditions.

Table 2-4 summarizes the Key Potable Water Quality parameters that must be met by the SWRO Desalination Plant.

Given the treatment system being installed, and the use of sea water from an open ocean as a raw water source these parameters should be able to be met by the Contractor.

The Employer would not accept any product water that did not meet the health requirements. The employer may accept for limited periods of time water that meets the health requirements but does not meet the aesthetic requirements. However consistent or regular transgressions of the aesthetic requirements would not be accepted.

**Table 2-4
Key Potable Water (Product Water) Quality Requirements**

Parameter	Requirement (maximum)
1. Physical Requirements	
Colour	10
Odour	Unobjectionable
Taste	Unobjectionable
Turbidity (NTU)	Less than 1
pH	6.5 – 8.5
2. Chemical Requirements	
Chloride (as Cl) (mg/l)	250
Free Residual Chlorine (as Cl) (mg/l)	Minimum 1 (with option to vary from 0.5 to 1.5, to meet Employer's need)
Alkalinity (Total as CaCO ₃) (mg/l)	200
Free Ammonia (mg/l)	0.06
Albuminoid Ammonia (mg/l)	0.15
Nitrate (as NO ₃) (mg/l)	50
Nitrite (as NO ₂ ⁻) (mg/l)	3
Fluoride(as F ⁻) (mg/l)	1
Total Phosphate (as PO ₄) (mg/l)	2
Total Dissolved Solids (mg/l)	200
Total Hardness (as CaCO ₃) (mg/l)	250
Total Iron (as Fe) (mg/l)	0.3
Sulphate (as SO ₄) (mg/l)	250
Oil and Grease (mg/l)	0.2
Calcium (as Ca) (mg/l)	100
Magnesium (as Mg) (mg/l)	30
Sodium (as Na) (mg/l)	200
Manganese (as Mn) (mg/l)	0.1
Boron (mg/l)	2.4
3. Other Parameters	
E Coli and Cryptosporidium	0
Lange liar Saturation Index (LSI)	0 to 0.2
Total Recoverable Hydrocarbons	0

2.4 Concentrate/Waste Stream Water Quantity and Quality

The discharge from the SWRO Desalination Plant including concentrate (brine) from the SWRO membrane system; sludge collected at the DAF clarifier/backwash from pre-filter; spent backwash water from the pre-treatment system, and spent membrane cleaning solutions and flush water shall be treated such that it does not exceed the limits presented in Table 2-5 (as per CEA (Central Environmental Authority) guidelines).

Table 2-5

SWRO Desalination Plant Concentrate/Waste Discharge Limits (as per CEA Guidelines)

Parameter	Unit, type of limit	Discharge Limit ⁽¹⁾
Total suspended solids	mg/L, max	250
Total dissolved solids	mg/L, max	Not more than 1 % higher than ambient salinity at 2 meter depth from the shore
pH at ambient temperature	-	7 – 9.0
Biochemical oxygen demand (BOD ₅ in five days at 20°C)	mg/L, max	400
Temperature at the measurement point	°C, max	40
Oil and grease	mg/L, max	Non Detectible
Phenols*	mg/L, max	5
Chemical oxygen demand (COD)	mg/L, max	800
Dissolved Phosphates	mg/L, max	5
Ammonia nitrogen (as N)	mg/L, max	150
Cyanide (as CN)*	mg/L, max	0.4
Total residual chlorine (as OCl ⁻)	mg/L, max	0.2
Fluorides (as F)	mg/L, max	5
Arsenic (as As)*	mg/L, max	0.2
Cadmium (as Cd)	mg/L, max	0.10
Chromium, total (as Cr)	mg/L, max	0.10
Chromium, hexavalent (as Cr ⁶⁺)*	mg/L, max	0.05
Copper (as Cu)	mg/L, max	1.0
Lead (as Pb)*	mg/L, max	0.10
Mercury (as Hg)*	mg/L, max	0.01
Nickel (as Ni)*	mg/L, max	1.0
Selenium (as Se)*	mg/L, max	0.10
Zinc (as Zn)*	mg/L, max	5
Silver (as Ag)*	mg/L, max	0.35
Pesticides (Total)*	mg/L, max	0.05
Surfactants (Total)*	mg/L, max	10
Faecal Coliform level	MPN/100mL, max.	*10 ⁷
Radio Active Material:*	micro curie/mL, Max.	10 ⁻⁸ 10 ⁻⁷
(a) Alpha emitters		
(b) Beta emitters		
Sulphides (as S)*	mg/L, max	5

Note:

Except for salinity, the limits given in this table should be measured at the entrance of the outfall preferably at the pumping station or a manhole.

*: These parameters are not found in sea water, but listed here to show the limit as per CEA guide lines.

CHAPTER 3. GENERAL ENGINEERING, PROCUREMENT AND CONSTRUCTION (EPC) APPROACH AND CRITERIA

3.1 Description of General EPC Approach

The Contractor shall consult with the Employer throughout the design, procurement and construction activities involving the entire SWRO Desalination Plant facilities, access to existing public utilities, power supply to site as well as establishment of new approach roads (including upgrade to existing roads adjacent to the site), provision of new pipelines, electrical services, other facilities and other utility services in and around plant.

The Contractor shall also consult with the Employer in respect of any Works outside of the boundary of the SWRO Desalination Plant site such as seawater intake and outfall pipes, seawater intake structures and other brine discharge pipe, etc.

3.2 Key Engineering, Procurement and Construction Tasks

The overall project implementation consists of the following general tasks:

- a) Engineering and design. Preparation of all engineering studies and activities needed to complete project design, including but not limited to bathymetric survey, geotechnical survey, topographic survey for construction any other relevant studies;
- b) Preparation of design review packages to achieve design progress in accordance with Attachment 4;
- c) Mobilization and demobilization for project construction;
- d) Preparation of the project site for construction;
- e) Removal and/or relocation of existing above and underground structures, piping and other facilities, equipment, debris, vegetation and other physical obstacles to execution of project construction located at the site designated by the Employer for the 24 MLD SWRO desalination plant and or any construction water and other services supply routes;
- f) Identification and removal or alleviation of surface and subsurface obstacles along the route of the intake and discharge piping and on or above the intake pump station, the electrical interconnection facilities and the potable water delivery system;
- g) Construction of electrical supply facilities for interconnecting the SWRO Desalination Plant electrical system from the 100%-load 33 kV electrical conduits for the desalination plant electrical system with the 1.1 kV electrical switchgear of the SWRO desalination plant;
- h) Specification of equipment (aligned with Employer performance requirements);
- i) Selection of vendors for all mechanical, electrical and instrumentation equipment, membranes, cartridge filters and consumables with the approval of the Employer. Managing of all vendors and logging and exercising all warranties to ensure the efficient highest quality and defect-free products as well as on-time delivery. Completion of final design;
- j) Preparation of design review packages and other deliverables as indicated in attachment 4 and as required to achieve overall plant performance, durability and quality;
- k) Obtaining design, procurement and construction related licenses and permits ensuring that any assistance or support required from the Employer is identified as soon as possible;
- l) Ensuring timely procurement, manufacture, delivery, unloading, unpacking, inspection, installation and testing of equipment;
- m) Integrate construction of Works to ensure safety of personnel, assets and environment;

- n) Pre-commissioning and commissioning of individual equipment, items of plant and entire systems using a consistent step-by-step methodology prioritizing early operation of the seawater intake and brine systems, pre-treatment system and treatment systems – so that each system is reliable and can support uninterrupted operation of the entire system in a safe and reliable manner to produce Potable Water;
- o) Performance testing of Works;
- p) Training of plant operations personnel;
- q) Preparation of Works Operation Service systems, standard procedures and manuals;
- r) Preparation of Works “as-built” construction drawings;
- s) Provision of construction, commissioning and Operation Service spare parts for all items of plant.

An indicative list of Contractor’s Key Responsibilities is summarized in Table 3-1. Other items (where noted in other parts of this document or the Contract) may be added to this list to make it comprehensive.

The Employer shall have the right to seek information, updates and right to inspect works listed works in this Table 3-1 or other works that are part of the DBO package. The Contractor shall consult and coordinate with the Employer to ensure ongoing approvals (as required to progress all works noted in Table 3-1)

Table 3-1: Contractor’s Key Responsibilities

No.	Description
1	Project Management / Administration
1.1	Project Management and Coordination
1.2	Initial and Ongoing Design Project Deliverables
1.3	Daily, Weekly, Monthly, Quarterly or Annual Progress and Compliance Reporting to Employer
1.4	Any other services required to achieve best Practices in Project Management in accordance with Project Management Standards (including Project Management Institute http://www.pmi.org/PMBOK-Guide-and-Standards.aspx)
2	Engineering & Design
2.1	Updates on the Compliance with Environmental Obligations listed in the Environmental Impact Assessment
2.2	Development and Implementation of the Environmental Monitoring Plan
2.3	General Layout, Site Layout, Plant Layouts and Layouts of key Areas of Work or Interfaces
2.4	Roadway Improvements and New Access Roads
2.5	Civil/Site Work (grading, paving, drainage, fencing, security, access control and facilities and landscaping)
2.6	Utility Installations and Connections (electrical, water, sewer, telecommunications)
2.7	Connecting Pipelines, Tanks and Utilities
2.8	Architecture
2.9	Structures
2.10	Power Consumption for entire system
2.11	Chemical area arrangement and chemical usage within entire treatment process
2.12	RO projection
2.13	Site Landscaping
2.14	Plumbing and Drainage
2.15	Fire Protection
2.16	Heating, Ventilation and Air Conditioning systems (including exhaust systems) and linkage to fire detection & protection systems.
2.17	Electrical systems
2.18	Instrumentation and Controls (INC.) System including overall Plant Control System, Programming Logic Controllers and Supervisory Control and Data Acquisition (SCADA) system, servers, IT infrastructure (fibre loops)
2.19	A full set of process and instrumentation drawings (P&IDs)
2.20	Process Instruments and hardwired control systems for all systems including seawater intake, outfall and the entire Works
2.21	Digital Communications
2.22	Process Equipment Layouts
2.23	Process Equipment Design Integration
2.24	Equipment Utility Connections
2.25	Signage for the Construction Site
2.26	Intake Pumps
2.27	Pre-treatment Facilities
2.28	Waste Discharge Systems
2.29	Cartridge Filters
2.30	RO Pumps, Pipework and associated works
2.31	RO Trains & Clean-in-Place System

2.32	Energy Recovery System
2.33	Chemical Unloading, Handling, Feed and Monitoring Systems
2.34	Re-mineralization Equipment and Controls
2.35	Potable water Storage Tank and associated works
2.36	Potable water Pump Station
2.37	Potable water conveyance including required pipework connections, air valves, scour valves, isolation valves, pipe supports, bridge crossings, recirculation lines, drains, vents and instrumentation
2.38	Process Control Panels (Local Panels and Remote Terminal Units)
2.39	Valves & Piping
2.40	Spare Parts (including start-up/construction spares, commissioning spares and Operation Service spares) and Spare Parts storage
2.41	Transfer Pumps
2.42	Chemical Storage Tanks, Bunds and Pipe Connections for Loading, Unloading and Cleaning. All required level indication and alarms to prevent over-flow
2.43	Hoists & Cranes
2.44	Electrical Metering Equipment
2.45	Transformers
2.46	Three phase Standby Generator
2.47	Electrical Switchgear
2.48	Electrical Control Panels
2.49	Cables, Conduits & Trays
2.50	Power and Control Wiring
2.51	Indoor/Outdoor Lighting
2.52	Grounding/Earthing (including visible earthing provision) for all items of plant
2.53	Lightning and Corrosion Protection Systems
2.54	Fire Protection/Detection/Alarm Systems. Early smoke Detection and Alarm systems
2.55	Yard Piping
2.56	Seawater Intake Structure, Grilles and Intake Conduits (Intake System)
2.57	Potable water system
2.58	Service Water and Air
2.59	Valves & Instruments
2.60	Annunciation Panels
2.61	Desktop Computers, printers, scanner and fax machine
2.62	Laboratory Equipment
2.63	Furnishings and Office Equipment
2.64	Any other Engineering and Design effort to achieve highest standards of Safety, Environmental Compliance, Public Health, Equipment and Plant Guarantees, Plant Performance, Plant Availability and Durability (Design Life)
2.65	Training and involving the Employer's Staff in design
3	Construction Services
3.1	Supply of Power, Water and Other Utilities, Services, Chemicals, and Consumables during the Time of Works Construction, Pre-commissioning and Acceptance Testing Through to Completion
3.2	Relocation of Existing Utilities & Piping
3.3	Building Erection
3.4	Equipment Installation
3.5	Temporary Ground Access
3.6	Outdoor Lighting and Security Systems
3.8	Fencing and Access Control Gates and System
3.9	Any other Construction services to achieve highest standards of Safety, Environmental

	Compliance, Public Health, Equipment and Plant Guarantees, Plant Performance, Plant Availability and Durability (Design Life)
4	Equipment Procurement
4.1	Specification Preparation, Equipment Selection, Purchase & Delivery and Installation
4.2	Review & Analysis for Compliance with Specifications
4.3	Placement of Purchase Orders and Issuance of Subcontracts
4.4	Packing, Marking, Shipping, Expediting, Inspecting, Shipping, International Shipping, Customs, In-land and air transport and all required services to ensure equipment is delivered to site timely and in the best possible condition
4.5	Processing of Invoices for Payment
4.6	Construction materials such as concrete, rebar, small diameter piping, etc., supplied by the Bidder
4.7	Initial Set of Equipment Spare Parts (for start-up, commissioning and operation)
4.8	All other items that are included in the Engineering & Design
5	Site Work
5.1	Site Preparation Including Demolition & Relocation of Existing Facilities and Piping
5.2	Roadway Improvements and New Access Roads
5.3	Civil / Site Work (grading, paving, drainage, fencing)
5.4	Utility Installations & Connections (electric, water, sewer, telephone)
5.5	Foundation & Slab Installation
5.6	Building Installation
5.7	Plumbing Installation
5.8	HVAC Installation
5.9	Fire Protection Equipment Installation
5.10	Electrical Power, Grounding, and Lighting Installation
5.11	Instrumentation and Control System Installation, Point-to-Point Checks and any required Calibration and Installation of Field Instruments
5.12	Communications Work
5.13	Equipment Installation
5.14	Landscaping
5.15	Signage Installation
5.16	Any other Site Works to achieve highest standards of Safety, Environmental Compliance, Public Health, Equipment and Plant Guarantees, Plant Performance, Plant Availability and Durability (Design Life)
6	Construction Management
6.1	Construction Supervision
6.2	Construction Inspection, Quality Assurance (Inspection and Test Plans) and Quality Control
6.3	Shop Drawing Reviews
6.4	Coordination of Field Requests for Information
6.5	Employer Liaison
6.6	Progress Reporting
6.7	Cost & Scheduling
6.8	Records & Document Maintenance
6.9	Equipment Receipt
6.10	Bulk Receipt
6.11	Safety management systems, equipment and clothing
7	Commissioning and Acceptance Testing
7.1	Pre-Commissioning Planning and detailed Commissioning Plan

7.2	Supply of Consumables (power, water, chemicals, etc.) during Commissioning and Acceptance Testing and all required spares
7.3	Training to all Operators, Supervisors, Subcontractor and Employer staffs
7.4	Providing Temporary Operation Service Staff During Commissioning and Acceptance Testing and Assisting the Employer with Retaining and Training of Permanent Operation Service Staff
7.5	Preparation of Operation Service Manuals
7.6	Start-up and Commissioning of Process and Non- Process Systems of Both Full-Scale Plant
7.7	Final Acceptance Testing, Data Analysis and Reporting to Employer
7.8	Punch Listing and rectification of all Defects
7.9	Final Project Documentation
7.10	Transfer of SWRO Desalination Plant to the Employer upon completion of 7-year Operation Service Contract
8	Plant Operation
8.1	One-Year Engineering Support to Employer after the Completion of the 7-year Operation Service Contract
8.2	Personnel
8.3	Operation Service
8.4	Chemicals
8.5	Insurance
8.6	Membranes
8.7	Operations Licenses/Regulatory Compliance
8.8	All Required Facilities and Services for the full Operation Service Scope
8.9	Obtaining ISO Standard for the Plant

**Table 3-2
Contractor’s Key Personnel during Design and Build period (Minimum Requirement)**

The Contractor is responsible for providing adequate and competent resources for undertaking the Project. As an indication, the following key personnel are suggested.

No.	Position	Minimum Qualification	Total Work Experience [years]	Experience In Similar Work [years]
1	Lead Design Engineer (Treatment Process)	Bachelor degree or equivalent in Mechanical / Chemical Engineering	15	10 Must include SWRO desalination plant experience
2	Design Engineer (Civil / Structural Design)	Bachelor degree or equivalent in Civil Engineering Masters qualification in Structural Engineering	12	8
3	Design Engineer (Electrical)	Bachelor degree or equivalent in Electrical Engineering	10	5
4	Design Engineer (Mechanical)	Bachelor degree or equivalent in Mechanical Engineering	10	7 Must include SWRO desalination plant experience
5	Design Engineer (Water Supply & Civil Design)	Bachelor degree or equivalent in Civil Engineering	12	8 Must include major pipeline design experience
6	Control Systems/Control Philosophy Specialist	Bachelor degree or equivalent in Mechanical / Process Engineering or Computer Science or Equivalent	12	7 Must include RO desalination plant experience
7	PLC and Instrumentation Specialist	Bachelor degree or equivalent in Mechanical / Electrical / Industrial Engineering	12	7 Must include RO desalination plant experience
8	Construction Manager – Desalination Plant	Bachelor degree or equivalent in Civil / Mechanical Engineering or Equivalent	15	8 Must include SWRO desalination plant experience
9	Construction Supervisor – Intake / Outfall	Bachelor degree or equivalent in Civil Engineering	15	8 Must include Intake and/or Outfall construction experience
10	Health and Safety Officer	Bachelor degree or equivalent in Engineering	10	5
11	Environmental Specialist	Bachelor degree or equivalent in Environmental Management	10	5
12	Sociologist / Community Development Officer	Bachelor degree or equivalent in relevant field	10	5

**Table 3-3
Equipment (Minimum Requirement)**

The Contractor must demonstrate that he has the equipment required for execution of the Facility based on his technical proposal.

No.	Equipment Type and Characteristics	No. Min. Number Required
1	Backhoe excavator (crawler type) 90 - 120 HP	2
2	Backhoe excavator (wheel type)-	4
3	Generator – 150 kVA	2
4	Dump Truck (4T, 2T)	8
5	Truck Crane (15T)	2
6	Mobile crane (10T)	2
7	Truck mixer (5 cubic meter)	3
8	Submersible dewatering pumps (4”, 6”, 8”)	10
9	Sludge pump (3 HP & 7 HP)	2
10	Concrete Pump Car (95m ³ /hr)	1
11	Vibro hammer (2T)	2
12	Concrete Vibrator (electrical) with long flexible cables 2”	10
13	Butt Fusion Machines	2
14	Plate Vibrators (Earth)	2
15	Marine vessels	2
16	Dredging equipment	2

3.2.1 Design Services

The Contractor shall have full responsibility for project design. The design process shall include the following key activities but not limited to:

- a) Engineering of the full-scale plant and all required engineering approval submissions;
- b) Process and mechanical design of the full-scale plant;
- c) Civil and structural design: The standards mentioned below shall be used as applicable; however, other British or other internationally recognized equivalent standards shall be used for specific areas of design;
 - i. BS 5950 Structural Steel
 - ii. BS 5400 Bridges and related structures
 - iii. BS 8110 Reinforced Concrete Framed building structures
 - iv. BS 8007 Water retaining structures
 - v. BS8004 Foundations
 - vi. BS 6399 Part 1 Design loading for building - Live Loads
 - vii. BS6312 “Design of Buildings for High Winds –Sri Lanka –Ministry of Local Govt. Housing and Construction -1980” and BS CP 3 –Chapter V. Basic data for the design of buildings - Wind Loads
 - viii. BS 4449 Specification for steel bars for reinforcement of concrete
 - ix. BS4461 Rolled steel bars for reinforced concrete
 - x. BS 5328 Specifying concrete including ready-mixed concrete
 - xi. BS 8110 Part I 1997 – Code of Practice for Design and Construction.
 - xii. BS 8110 Part II 1985 – Code of Practice for Special circumstances.
 - xiii. BS 8110 Part III 1985 – Design Charts for Reinforcement elements.
 - xiv. BS 8007 1987 – Code of Practice for design of concrete structures for aqueous liquids.
- d) Instrumentation & control design;

- e) Electrical systems design;
- f) Development of site layout and architectural plans and specifications;
- g) Specification of Mechanical, Electrical and Instrumentation equipment and items of plant;
- h) Selection of vendors for mechanical, electrical and instrumentation equipment and items of plant;
- i) Development of building, piping & Works layouts and detailed arrangements (and sectional views);
- j) Design of foundations for all structures and equipment;
- k) Design of electrical/mechanical/I&C and other utility systems;
- l) Design of potable water pump station, delivery pipelines, structures and associated equipment;
- m) Design of all equipment, plant and items to ensure safe, efficient and effective use of SWRO Desalination Plant and associated works;
- n) Design for fire detection alarm and protection system according to BS 5839;
- o) Design of standby power supply system for unexpected power failure for the safe shut down of the plant and protect the components of the treatment system and for administrative works;
- p) Design of standby power supply system (generator) to operate at least one train (6 MLD), CIP unit, PLC and SCADA;

Design Review Deliverables

The Contractor shall prepare all design review deliverables as described below and shall be available to respond to follow-up requests for clarification and to attend meetings associated with the design package review. Summary of design review deliverables provided in Attachment 4.

A Design progress measurement system will be implemented by the Contractor to ensure transparency of design deliverables throughout the project phases. The following is proposed:

- a) 20% complete – First formal issue of drawing / document / Specifications / information for early comments / feedback and Employer internal design review. This should be submitted within 1 month of Contract commencement;
- b) 45% complete – Issue of updated Drawings by the Bidder following review with the Employer and resolution of all major issues identified in the design review. Only when this part is completed, should Contractor place major orders – this will ensure Contractor has Employer input before major Vendor orders are placed. This should be completed within 3 months of Contract commencement;
- c) 60% complete – First Formal issue to the Employer for further review and approval, At this stage the Bidders shall also complete any Change or Deviation notices clearly identifying areas where any particular specification requirements cannot be met or an alternate solution is proposed. Bidder shall also secure approval from any required statutory authorities. This should be completed within 5 months of Contract commencement;
- d) 75% complete – Issue for Construction (IFC) incorporating any final comments from the Employer. This should be completed within 6 months of Contract commencement;
- e) 90% complete – Further update incorporating feedback from Bidders Construction or Commissioning teams and enclosing confirmation from the Bidder’s Operation Service Representative that the drawings / documents will meet the operational requirements for the SWRO Plant including performance warranty, reliability and operability. At this stage the Employer may also sign-off the drawings and authorize pre-commissioning and commissioning to take place. This would continue throughout the Construction, Pre-commissioning and Commissioning period;
- f) 100% complete – when drawings are CAD back-drafted to as-constructed stage. This shall be completed within 90 days after the issue of the Commissioning Certificate.

The agreed Bidder’s program will become the Contractor’s baseline program at commencement.

3.2.2 Construction Services

The Contractor shall be responsible for all construction activities, including management of all sub-contractors completing portions of the work. The Contractor’s site manager shall be supported by project engineering staff in the field to resolve technical issues as they develop.

Construction activities requiring coordination with the Employer of the SWRO Desalination Plant shall be identified in the Contractor’s project schedule. Principal areas requiring consultation include:

- a) Construction of SWRO desalination plant intake and outfall;
- b) Connection of the electrical supply system of the SWRO desalination plant to the Ceylon Electricity Board’s power supply system;
- c) Bidder shall provide a list of areas where they require Employer to assist or support to coordinate with the Ceylon Electricity Board;
- d) Re-routing of pipelines passing through the SWRO desalination plant site, as needed if such pipelines are found;
- e) Connection of the SWRO desalination plant to the JKWSSP water supply system at locations and conditions (pressure and flow) designated by NWSDB;
- f) Communication, internet and other utilities and services needed for construction and normal Operation Service of the SWRO desalination plant;
- g) Developing SWRO plant storm drain system;
- h) Contractor mobilization and demobilization;
- i) Construction staging areas location, access and use;
- j) Contractor, sub-contractor and other general parking and overall site access;
- k) Contractor shall secure construction power from the Ceylon Electricity Board;
- l) Use of potable water during construction and commissioning;
- m) Delivery of equipment, materials, chemicals, and other consumables to the site;
- n) Contractor security, safety, QA/QC and execution plans

The Contractor shall be responsible for placing all equipment orders and coordinating delivery of equipment, materials, and consumables (chemicals, membranes, cartridge filters, etc.) to the site. Because of their significance to long-term operation of the desalination facilities, warranties for several process components shall extend beyond the one-year warranty for the EPC Agreement. These longer-term warranties shall be assigned to the Employer. The terms of the warranties listed below shall begin as of the first day after passing the plant acceptance test and shall continue as a minimum for the time specified below:

- i. RO Membranes: 5 to 7 years prorated replacement warranty is required based on membrane performance. The replacement of membranes which fail before five years of operation are the responsibility of the Contractor
- ii. Cartridge Filters (if used): A minimum of 0.5 to 1 year cartridge filter useful life warranty. All cartridge filters shall be capable of maintaining reasonable performance and the differential pressure increase through the filters shall not exceed 1.0 bar for a period of minimum of 8 weeks.
- iii. High Pressure RO Pumps, Motors, Energy Recovery Devices (ERDs), and Variable Frequency Drives (VFDs): A 5 years extended performance efficiency warranty is required, commencing on the date of satisfactory completion of the Project Acceptance Test and initiation of the plant operations phase.
- iv. Pre-treatment System: A 5 years extended warranty is required for all primary components of the pre-treatment system, and 5-year warranty for the membrane modules commencing on the date of satisfactory completion of Project Acceptance Test.

Potable Water Storage Tank at the 24 MLD Plant and Other Storage Facilities which are Part of the Potable Water Distribution System – a 2-year extended warranty is required, commencing on the date of satisfactory completion of Acceptance Test. This tank and other structures shall be built above ground and made of concrete.

The agreed Bidder’s program will become the Contractor’s baseline program at commencement.

3.2.3 Plant Start-up, Commissioning and Acceptance Testing

Start-up, commissioning and acceptance testing of the both SWRO plant and potable water pipelines shall be the responsibility of the Contractor. Contractor shall appoint a dedicated Commissioning Manager from commencement so that Commissioning requirements are considered in the design, procurement, manufacture, and construction stages.

Formal Plant Commissioning and Acceptance Testing Plan for each component of the project shall be developed to cover these activities as soon as possible and no later than six (6) months prior to the start of commissioning. This phase of the projects shall culminate in a 30-day Acceptance Test. The Employer will review and approve the Start-up, Commissioning and Acceptance Testing Plan. The Contractor shall be responsible for all activities associated with the Works start-up, commissioning and acceptance testing.

3.3 Project Team Organization and Key Sub-contractors

Bidder’s organization chart will become the Contractor’s organization chart at commencement.

All key project task managers of the Contractor’s team are expected to be located in Sri Lanka within a reasonable proximity of the project site for the duration of the activities they oversee. Once assigned to their respective positions in the team, the key project team members shall not be replaced without prior approval by the Employer.

The Contractor shall be responsible for the selection of all other sub-contractors involved in the construction of this project and shall have the overall financial responsibility for design, procurement, construction, pre-commissioning, commissioning and start-up of the Works.

3.4 Quality Assurance / Quality Control (QA/QC) Plan

3.4.1 Design Team QA/QC

For each component of the project, the Contractor shall prepare a Project Management Plan to describe and communicate to project personnel the scope of work, goals, objectives and requirements for project work.

One portion of the Project Management Plan shall be the Quality Management Plan, which shall address procedures that the Bidder will adhere to ascertain the quality of their work and compliance with all regulatory requirements applicable to project implementation. An individual shall be assigned as the project QA/QC Manager.

3.4.2 Construction Team QA/QC

The Contractor shall develop a separate Quality Management Plan for executing the construction phase of the project.

3.4.3 Inspection

1. Inspection by Inspection Agencies

The Employer may require that various Goods to be supplied under this contract conform to the requirements given in Employer's Requirements. As directed by the Employer the Contractor shall obtain the Certificates of Inspection from one of the following inspection agencies in the format acceptable to the Employer

- i. Loyds Register,
Loyds Register Industrial Division,
Register House, 29 Wallesey Road,
Croydon DRO-2AJ, U.K.
- ii. Crown Agents,
Quality Assurance & Inspection Service,
Townend House, Walsall WSI INT, U.K.
- iii. Societe Generale de Surveillance S.A.,
1, Place des Alpes, Case Postale 898,
CH-1211 Geneva 1, Switzerland.
- iv. Bureau of Veritas,
Cedex 44, 92077 Paris Le Defense,
France.

2. Pre-shipment Inspection by Employer's Personnel

The following Materials may be inspected by the Employer at the factory:

- i. RO membranes
- ii. Ultra Filters Membrane (if required)
- iii. Granular media filter pressure vessels (if required)
- iv. RO high pressure feed pumps
- v. LV electrical cabinets, generator sets and all motors
- vi. SCADA, PLC system
- vii. DI / HDPE pipes, fittings, specials and accessories and valves
- viii. Any other relevant goods on request of Employer's Personnel giving adequate notice

Each shipment should be inspected by Employer's Personnel before dispatching at Manufacturer's factory. The Contractor shall provide the Employer's representative the test program and test process before at least one month of scheduled testing and get his approval. Contractor shall organise the inspection and make all arrangements. The inspection programme and costs shall be agreed with the Employer's representative.

The inspection at the specific manufacturer shall include;

- i. Introduction to design standards and procedures adopted.
- ii. Introduction to relevant procedures and quality control standards.
- iii. Manufacturing process, and Quality Assurance procedure.
- iv. Testing procedures, mill certificates, product conformity certificate, Quality Management System Certificate and any other relevant certificates etc. regarding the products.
- v. Packing & dispatching procedure

The Contractor shall arrange for up to two of the Employer’s Personnel for each pre-shipment inspection visit to the country of manufacture. The duration of inspection for each officer shall not be less than five (5) days excluding travelling to the Manufacturer’s country and back. All visas, insurance and permits, air fares, taxes, transfer fees accommodation on full board basis and per diem allowance, traveling expenses within the manufacture’s country, other minor expenses to perform the inspection during pre-shipment inspection visit at manufacture’s country shall be arranged and paid by the Contractor under the Provisional Sum provided for this purpose. The payments shall be made by the Contractor in accordance to the circular MOFP 01/2010/01 dated of 2010/10/11 of Ministry of Finance and Planning of Sri Lanka. Contractor shall assist and bear all costs (from the Provisional Sum) associated for obtaining visa for the inspection from the relevant Embassy/ High commission for Employer’s Personnel for such inspection. The Employer’s Personnel shall be guided by an experienced engineer and quality controllers of the Contractor/Manufacturer who shall be competent in English language. The Employer’s Personnel shall be provided with printed catalogues, manuals, illustrative videos etc., relevant to the manufacturing process and provide extra information as requested by them as appropriate, and the Contractor shall arrange to dispatch these documents to the Employer’s Personnel, to be paid for under the Provisional Sum. The Contractor shall submit to the Employer’s representative the reports of all the factory tests to format acceptable to the Employer’s representative including all the conditions of testing, methods, measuring, results and graphs. The Contractor shall also submit manufacture’s test certificates. Nominated inspection agency should be present during pre-shipment inspection by the Employer’s Personnel and should assist them for the testing and inspection. Any inspections carried out by Inspection Agencies or Employer’s Personnel shall not relieve the Contractor of his obligations under the Contract. Contractor/Manufacturer shall not deliver / dispatch materials from the Factory or Stores without approval of the Employer’s representative.

3.5 Site Establishment

3.5.1 Office Facilities

The Contractor shall provide, erect, furnish, equip, clean, maintain, air condition, heat, light and, if directed, subsequently remove a temporary building as scheduled below for the exclusive use of the Employer’s Representative and his staff at the site for proposed SWRO Desalination Plant. This building shall be adjacent to the Contractor’s site office at site and are required for the Design-Build Period only.

- a) Main Office building, including washrooms, 100 m².
- b) Sub Office building, including washrooms, 60 m².

The Contractor shall provide furniture and equipment as listed in this sub-clause for each office mentioned above.

Floors shall be covered by heavy duty vinyl sheet throughout. The washroom shall be provided with wash basin and cold potable water supplies and a flush operated WC connected to an approved septic tank (which shall be removed and refilled at the end of the Contract) provided by the Contractor. All doors shall be lockable and there shall be sufficient windows and adequate fly screened ventilation.

A car port for four cars shall be provided adjacent to the site office to provide shaded accommodation for the sole use of the Project Manager’s staff. Vehicle and pedestrian access to the office shall be maintained and kept free of dirt and other obstructions at all times.

The Contractor shall supply and maintain the office building, furniture and equipment at least as follows for Main office and Sub Office:

Internal and external entrance door mats and external boot scraper

- i. A battery-operated wall clock
- ii. Four (04) desks with chairs
- iii. One (01) drawing board, tee square and stool
- iv. Four (04) visitor chairs
- v. For the main office a meeting table and chairs
- vi. Two (02) lockable metal filing cabinets with four drawers and all fitments
- vii. Two (02) plan chests with at least 8 drawers each
- viii. Three (03) book cases each 1.2 m long and fitted with 4 shelves 400 mm apart
- ix. One (01) maximum/minimum thermometer
- x. Two (02) desktop computers with Intel Pentium 1.7 GHz processors – latest generation processor, minimum 500 Gb hard disks, 4 Gb RAM, Windows 8 Professional, Microsoft Office latest versions, uninterruptible power supply and surge protection device.
- xi. One (01) computer installed with a fully operational Internet, e-mail system with modem.
- xii. 2 x 24 inch monitors for the computers
- xiii. 1 laptop computer with Intel Pentium 1.7 GHz processors – last generation processor, minimum 500 Gb hard disks, 4 Gb RAM, Windows 8 Professional, Microsoft Office latest versions.
- xiv. One (01) printer, HP Laser jet A4 colour
- xv. One (01) Parallel port back-up device
- xvi. All necessary interconnecting cables between the screens, printer and back-up device.
- xvii. One (01) dry powder photocopy machine (up to A3 capacity) with printing and scanning option.
- xviii. One (01) electronic scientific calculating machine with at least two memories and printer or printing attachment (battery/mains operated)
- xix. One (01) 'tea service' for 10 persons
- xx. One (01) refrigerator of capacity 150 litres
- xxi. Two (02) kettles
- xxii. Four (04) angle poise desk lamps
- xxiii. Two (02) variable speed floor mounted oscillating fans
- xxiv. Two (02) gas rings (with gas cylinder and regulator)
- xxv. General office and stationery equipment
- xxvi. General purpose cupboards including one with cleaning equipment
- xxvii. Lockable cupboard fitted for storage of survey instruments, staffs, tripods and other survey equipment
- xxviii. Adjustable blinds on all office windows
- xxix. Four (04) fire extinguishers (CO2)
- xxx. Dustbins and wastebaskets

The office and the materials, surface fittings and furniture shall be new at the start of the Contract.

The Contractor shall install a telephone/fax system in the office and make all arrangements including payment for connection to the national telephone network. The telephone system shall be suitable for email/Internet connection.

The offices shall be air conditioned and lit by electricity. The Contractor shall maintain light and cold air conditioning in all the rooms and clean daily all rooms, furniture, fittings and WC's throughout the period of the Contract. The Contractor shall provide full-time attendance on Site

to carry out these duties.

Before placing any orders or delivering any materials or fittings for the offices the Contractor shall obtain the approval of the Employer's Representative in writing as to the location and type of the structure and the furniture, fittings, and equipment to be supplied.

The office and contents shall be maintained until the Works have been completed and the final Certificate issued after which time they shall be removed by the Contractor and the Site cleared. The computers, screens, software, printers and back-up devices shall be handed over to the Employer in whom the ownership shall then be vested. All other office equipment and items shall be moved and integrated in the Plant office facilities. All items will be the property of the Employer at hand back at the end of the Operation Service Period.

3.5.2 Transport Facilities

The Contractor shall rent and supply vehicles described below for the use exclusively of the Employer's Representative and his staff.

Two (02) number pickups (4WD) and Two (02) number six seats Van, petrol or diesel engine of capacity above 2800cc with dual AC, cloth seats, locking fuel cap, tool kit, spare wheel and seat belts to front seats.

Vehicles shall be in very good working condition and registration less than 5 years, plain coloured and approved by the Engineer. The vehicles are for the exclusive use of the Engineer and his staff. The vehicles shall be licensed and insured for use on the public roads with comprehensive insurance cover for any qualified driver authorized by the Engineer, together with insurance cover for all authorized passengers and for the carriage of goods or samples.

The Contractor shall provide a competent, qualified driver for each vehicle. The drivers shall hold a -valid driver's license and shall be subject to the approval of the Engineer at commencement of their duties and throughout their employment. The Contractor shall provide fuel, oil and maintenance in conformity with the manufacturers recommendations and shall clean the vehicles inside and outside, and fuel and oil the vehicles daily. Vehicles shall be ready to be provided from 7.00 am to 6.00 pm on any day including government and mercantile holidays as requested by the officer who use the vehicle. The vehicles shall also be ready for use during or after office hours on these days. A suitable replacement vehicle shall be provided for any vehicle that is out of service for whatever reason for longer than 24 hours. Vehicles provided under this Contract may be required by the Engineer or his staff for use on other Contract Packages of Jaffna Kilinochchi Water Supply Project; even if the other Contract Packages are awarded to this Contractor or some other contractor, to travel outside of the contract limits. No additional payment will be made in respect to such uses as stated above. The Contractor shall provide all fuel and oil for such journeys and shall pay the drivers an appropriate and adequate accommodation and meal allowance when such journeys involve an overnight stay.

The Contractor shall adhere to maintenance concepts such as:

- a) Equipment;
- b) Road taxes for use on public highways as appropriate;
- c) Comprehensive insurance covering the Engineer and his authorized Staff and any driver authorized by the Engineer and for the carriage of goods and samples;
- d) Provision of a suitable replacement vehicle when a regular vehicle is unavailable or unserviceable for more than 24 hours;
- e) Depreciation
- f) Maintenance in a roadworthy condition and in conformity with the vehicle manufacturer's recommendation
- g) Fuel, oil, lubricants and other consumables
- h) Cleaning inside and outside daily

- i) Provision of a fulltime driver including all overtime payments and any accommodation payments including overnight accommodation allowance when n away from the duty station;
- j) Security

Vehicles shall be measured as number of vehicle months that is provided and maintained. Vehicles not provided for a full month will be measured for reduction on a pro-rata basis on contract unit rate. Payment for vehicles shall be at the unit price for each vehicle as contained in the bill of quantities. Maximum number of kilometres to be done per month from the 4000km per month. Any excess number of kilometres shall be paid on pro-rata basis at the contract unit rate for the vehicle month as an additional payment. For work carried out after 6.00pm, Contractor will be entitled for over time payment at the contract unit rate. No additional payment shall be considered for fluctuation of fuel prices. Vehicles shall be provided for as long as they are required by the Engineer and his staff in connection with the Contract, including a period beyond the certified date for Completion of the Works and shall remain the property of the Contractor on completion.

3.6 Project Implementation Schedule

The Bidder shall develop a detailed implementation schedule indicating all key design, procurement, manufacture, shipping, customs clearance, unloading, inspection, receipt, construction and commissioning activities as well as all activities associated with the connection of the SWRO Desalination Plant electrical system and intake and discharge facilities to the power plant facilities.

In addition, the Bidder shall provide a proposed project drawdown schedule with monthly milestone levels of project completion, which correspond to the amount of work incorporated in the monthly drawdowns, as part of the Bidder's bid submission.

The detailed project schedule shall delineate clearly the following information and milestones:

- a) The Total Duration of the Project Implementation;
- b) The key dates specified in the FIDIC contract;
- c) Start Date and Duration of All Key Design Activities (Preliminary Design and Detailed Design);
- d) Start Date and Duration of All Construction Preparation Activities;
- e) Start Date and Duration of Contractor Mobilization and Site Preparation;
- f) Start Date and Duration of Removal of the Equipment and Piping Designated for Removal/Relocation from the SWRO Desalination Plant Site by the Employer;
- g) Start Date and Duration of Construction of the SWRO Desalination Plant Intake and Discharge Pipelines;
- h) Start Date and Duration of Procurement and Installation of High Pressure RO Pumps, Energy Recovery Equipment; High-Pressure Stainless Steel Piping; RO Membrane Elements and any Other Significant Long Lead Time Items, Which Procurement, Installation or Start Up Requires Over Three Months;
- i) Start Date and Duration of Construction of Intake Facilities, Intake and Discharge Interconnecting Piping; Pre-treatment System; RO System and Post-Treatment Facilities;
- j) Start Date and Duration of all Inspection and Pre-Commissioning of all Seawater Intake, Pre-treatment and RO items of plant so that plant is certified complete prior to live Commissioning. Start-up, Duration of Construction, Commissioning, and Acceptance Testing of the Potable Water Delivery System to the Jaffna Water Supply Network;
- k) Anticipated Downtime (if Any) for Construction During the Monsoon Season;
- l) Start Date and Duration of Plant Start Up and Commissioning;
- m) Start and Finish Date of SWRO Desalination Plant Acceptance Testing and Works Transfer to the Employer.

The total length of the proposed project implementation schedule shall include appropriate float to cover key risks and shall not exceed the contract duration.

The agreed Bidder’s program will become the Contractor’s baseline program at commencement.

3.7 Civil Works Design Plan

3.7.1 Governing Codes and Standards

All work, materials and equipment shall be designed to comply with, and shall be installed in accordance with the requirements of all legally constituted state and local authorities having jurisdiction, including the building code, state and local ordinances, industrial safety orders, health and safety rules and other applicable standards. Unless otherwise specified in this document the precedent for the use of Standards is as follows:

1. Sir Lankan Standards
2. International Standards
3. British Standard
4. American Standard
5. Another Standard as agreed

3.7.2 Topographic Survey for Construction

An initial topographic survey of the SWRO Desalination Plant and the potable water delivery pipelines is presented in Attachments 2 and 3, respectively. The Contractor shall be responsible for the preparation of all topographic information the Contractor needs to complete the Project, especially including the seabed for the intake and outfall pipelines. The Contractor shall complete detail aerial survey of the plant site during the design and pre-construction phases of the Project, if they deem it necessary.

The Contractor shall be responsible for developing of the final site layout including the intake and outfall pipelines based on criteria provided herein. The proposal shall constitute acceptance that the available site is sufficient to accommodate the required facilities. Key site development and equipment layout criteria include the following:

3.7.3 Expandability

The site must be arranged and equipment placed such space and connections are identified for future expansion to 48 MLD net Potable Water capacity. In addition, the design shall ensure that future facilities can be installed without significantly disturbing components installed for the first 24 MLD plant.

This means that all infrastructure must allow for the following expansions without additional major engineering works:

- Expansion from 24 MLD to 48MLD
- Expansion to allow for additional Boron reduction from 2.4 mg/l to 1.0 mg/l
- Addition of a future DAF plant

With the exception of assets that have a life less than five years, in general this means that civil works and computer and communication systems must reflect the ultimate plant development while installed mechanical, electrical and electronic works and equipment must be sufficient for

the initial 24 MLD. When the expansion is required new mechanical, electrical and electronic works and equipment should be able to be installed following a ‘plug and play’ approach. Note that incoming power must be able to support the ultimate plant development.

The Bidder must allow for all future expansion work to be carried out without adversely impacting the daily operation of the 24 MLD operating plant.

3.7.4 Maintainability

Arrangement of equipment and facilities on the site shall provide adequate access for maintenance. This shall include removal and replacement of individual equipment items. Travelling bridge crane and or forklift access shall be provided to process areas including but not limited to the pre-treatment system; RO system, RO membrane cleaning system; chemical feed areas (in particular—chemical storage totes); cartridge filters; and dry chemical storage areas.

All installed pumps shall be removable for maintenance. Pumps installed indoors (e.g., the RO high pressure feed pumps) shall be accessed by permanently installed facilities (such as a traveling bridge crane).

Any outdoor pumps shall have properly designed weather protection so that Operators and Maintenance staff can undertake their works without exposure to the elements.

Additional space around the RO trains shall be provided to allow membrane removal. Clear space shall be provided to permit withdrawal of pressure vessels from the racks of the RO trains. Clear space of 4.0 to 5.0 meters shall be provided on both ends of each RO train to permit loading of membrane elements.

Hose bibs shall be provided throughout the Works for general maintenance requirements. Hose bibs, hoses and hose racks shall be spaced to provide complete coverage of the new facilities using standard hose lengths.

Floor drain gratings in trafficable areas shall be designed so that they take the full load of a Forklift or Mobile Elevated Work Platforms and made from materials that have long life and durability.

3.7.5 Accessibility

Equipment facilities shall be arranged to allow vehicle access (including emergency response vehicles) to all areas of the site so required by local codes and the Employer, including parking areas and designated chemical delivery routes. This requirement is specifically in addition to any other access required for maintenance and Works expansion.

Pumps and valves must be safety accessible by maintenance personal without the need for temporary access equipment.

A Site Plan for the SWRO Desalination Plant and the intake and discharge structures and pipelines shall be included with the proposal.

3.7.6 Plan for Staging/Laydown Area

The Bidder shall develop a Construction Staging Plan that indicates the location and size of the temporary construction staging (laydown) area, which will be used for storage of equipment, construction, materials, consumables, temporary power supply generators, construction trailers and other facilities which will be required to implement the Project. This plan shall also include

the contractor parking requirements. The plan must also show any areas of the beach that are proposed to be used as a staging area (subject to the Employer and local Authority approval).

At present, there are no designated locations for construction staging area for the 24 MLD project including associated pipelines. The Bidder shall prepare a layout of the staging area needed for the project and shall provide it to the Employer for consideration. The staging area shall be in immediate vicinity of the SWRO Desalination Plant site at the direction of NWSDB.

3.7.7 Grading and Drainage Plan

Finished floors of all buildings shall be a minimum 300 mm (0.3 meters) above the maximum existing ground elevation of SWRO plant site.

Storm drainage from the site of the 24 MLD plant shall be collected in catch basins and discharged via the SWRO Desalination Plant outfall, whilst complying with all Environmental controls as noted in this document and any Environmental approvals.

3.7.8 Sanitary Sewerage Management

Sanitary drainage from the desalination Works shall be collected on site and disposed off via septic tank located at the plant site. Drainage waste shall not be released to the seawater.

3.7.9 Geotechnical Survey

Preliminary geotechnical survey for the plant site is provided in Attachment 2. However, the bidder/contractor shall make their own interoperation of such surveys, and the Employer takes no responsibility for the accuracy of such reports, and or for the interpretations made by the Bidder/Contractor from such reports.

The Contractor shall be responsible for preparation of more detailed geotechnical survey as needed for SWRO Desalination Plant, the intake and outfall pipelines, potable water storage tank and potable water transmission line design and constructions and for any other hydrogeological studies and activities needed for Project implementation.

3.7.10 Roadways

Roads shall be designed to provide adequate turn-around for 16-wheel tanker trucks and fire trucks and shall be approved by the jurisdictional fire-fighting agency. Paved areas of the site shall consist of asphalt concrete (AC) paving on aggregate base course over compacted sub-grade and shall be designed such that it can allow the use of 20-ton 16-wheel trucks and the heaviest loaded vehicles required to attend site for construction, operation or maintenance.

Thickness shall be as required for wheel load. A liquid asphalt tack coat shall be applied on the base coarse before laying asphalt concrete paving. A liquid asphalt fog seal shall be applied two months after completion of paving work. Paving shall extend to all process areas to provide for maintenance access by forklift or other vehicle, as required.

Crushed rock conforming to applicable standards shall be provided in and around all equipment areas not abutted by AC paving. A 2-meter wide strip of crushed rock shall be provided around the belowground tanks and 1.5-meter wide strip of crushed rock shall be provided around equipment pads. Portland cement concrete curb and gutter meeting local standards shall be provided on established roadways and parking areas.

Maximum road gradients shall not exceed 5 percent; minimum gradients shall be 1 percent in the travelled direction and 2 percent cross-fall. Minimum width of roads shall be 6.0 meters.

Grading, foundation excavation, and compaction shall be conducted in conformance with prudent engineering practices, all applicable codes and regulations, and shall be inspected by a geotechnical engineer. Testing and inspection shall be conducted in accordance with all applicable regulatory requirements. Excess excavated material and unsuitable material shall be hauled offsite and disposed of at a site approved by local authorities and shall be transported along approved haul routes. All grades shall be sloped away from equipment pads, buildings and structures. All site areas shall be freely draining.

Storm water shall be collected on site and utilized for landscaping (if possible). Excess water should be routed to location from which it shall be pumped to the SWRO Desalination Plant outfall. The design storm duration and intensity shall conform to all applicable regulatory requirements.

Storm drainage piping shall be 400 mm minimum diameter reinforced concrete. Storm water inlets shall be side-opening type in conformance with local standards to the extent possible. Grating inlets shall be used only where side-opening inlets are not practical.

3.7.11 Equipment Pads

All equipment items, external supports, control panels, and other similar items shall be mounted on reinforced concrete equipment pads. All chemical storage and feed facilities shall be located in bunded containment areas constructed with reinforced concrete water-stopped, leak-tight curbs, and shall meet all applicable building code requirements. Each containment area shall be sloped to drain to a covered watertight sump.

Tanks and equipment shall be located on concrete slabs at least 0.3 meters above the finished floor. Concrete within containment areas shall be lined with an appropriate chemical resistant coating. The Bidder shall be responsible for design and construction of all equipment pads, including coordination of all required equipment anchors, electrical raceways, and sub-grade piping.

3.7.12 Seismic, Flooding, Monsoon and Tsunami Design

All equipment and facilities shall be suitably designed according to applicable construction code requirements and shall be compliant with requirements associated with extreme conditions such as flooding, monsoon impacts, and seismic and tsunami impacts. It is proposed to raise the site above the surrounding area, and to protect the site by a drainage system. Both actions fall within this contract. The site is to be elevated to at least 300mm above the surrounding area. The raised surface level must be suitably contained within a permanent retaining wall. A drainage system suitable for monsoon conditions must surround the site while an internal drainage system must also be installed. Drainage system may discharge their flows on the ocean side of the site in a manner that does not result in erosion. All buildings are to be constructed to the Sri Lankan building code. Buildings must be protected from the ingress of water from surface runoff. All underground conduits and trenches must also be protected from the entry of moisture and surface runoff. All anchor bolts, anchorage components and fasteners shall be constructed of duplex stainless steel of PREn Number of 40 or higher.

Bidders are advised that the site level, drainage system, buildings and underground conduits and trenches will be checked for these aspects at the design and construction stages.

3.8 Mechanical Works Design Plan

3.8.1 Governing Codes and Standards

The Bidder shall be responsible for the identification, implementation and compliance with all design and construction codes and standards applicable to this Project. The requirements of National and International (where there is not a National) Code and/or Standard (ISO) are to be used. Where not otherwise specified in this Bidding Document any variation to this, such as the use of a Code or Standard from a different jurisdiction must be approved by the Engineer. All work, materials and equipment shall be designed to comply with and shall be installed in accordance with the requirements of all legally constituted authorities having jurisdiction over the Project implementation and by the Employer.

3.8.2 Process Piping

3.8.2.1 General

Within the equipment pads the Bidder shall install the piping above grade or in trenches. Above grade piping shall be installed on supports. Any joints, in-line instruments, offtakes or connections must be properly supported. The above grade piping shall be arranged so that unobstructed foot access is provided to the equipment.

All process piping (excluding vertical train piping) shall be located in the piping trenches. No horizontal piping runs will be allowed to be supported from the pressure vessels or support rack assembly. All trenches shall be covered with plastic or aluminium bar type grating, with banded openings for pipe transitions and valve operating nut access. Grating penetrations for electrical conduit will not be permitted. Piping shall be configured in the trenches to allow required access for maintenance, permit connection to required blind flanges for future equipment, and provide dedicated runs for future piping.

Concrete Pipe trenches shall be constructed such that they are leak-tight and will not fill with groundwater. If groundwater or surface water (because of area washing, etc.) enters the trench it shall immediately flow towards a low-point so that all trenches can be de-watered immediately using a sump pump.

Appropriate number of sump pumps should be provided by the Contractor to keep the trenches in a clean and dry condition.

Concrete pipe trenches that convey chemicals (small bore pipelines, valves, etc.) should be epoxy coated so that concrete in the trenches is not damaged by chemicals. Provision should also be made to quickly remove gratings and install protective barriers and wash-down the pipe trenches on an annual basis and in the event of a spill or flooding, so that the pipe trenches can be accessed for maintenance or inspection as required.

3.8.2.2 Piping and Valves

All piping and fittings in contact with source (raw) seawater and concentrate (brine) shall be made either of plastic material of type and class suitable for the application, or of super duplex stainless steel of PREn Number higher than 40 (i.e., 254SMO, SAF2507, AL-6XN, or Zeron 100). Use of alternate materials is not allowed.

The Bidder shall include a list of materials for all piping and fittings which classifies the piping by the type of water or chemical they convey.

The Bidder shall select pipe materials for all process lines as part of the Works design. The Bidder shall demonstrate that the materials selected are appropriate for the service conditions. This requirement includes, but is not limited to, demonstration by the Bidder that:

- a) The pipe interior shall not be degraded by the transmitted fluid. The use of pipe lining is permitted. However, the Bidder must demonstrate that the lining material will protect the pipe interior from degradation and that the lining material will not be degraded by the transmitted fluid.
- b) The pipe exterior is adequately protected against the exterior environment. This requirement includes but is not limited to the impacts due to: the corrosivity of the soil; UV light; seawater, and the ambient air conditions (i.e., wind abrasion, ambient air temperatures of up to 40°C and air humidity of up to 80 %).

The Contractor shall use a 50-year service life for the design of pipes and valves and all pipe materials.

The use of PVC pipe shall be limited to pipe diameters 300 mm and smaller and the schedule and thickness of all PVC pipes shall be such as to exceed highest pressure expected, including transient pressures.

The following are general criteria, which shall be used in sizing piping systems throughout the project:

- a) Maximum velocity in plastic piping systems (including GRP, FRP and HDPE) shall be 2.5 meters per second (m/s), except seawater, which will be limited to maximum velocity of 2.0 m/s; pipes must be fixed to prevent movement due to dynamic loads;
- b) Maximum velocity in metallic piping systems shall be 3 m/s (other than seawater systems which shall be limited to 2 m/sec); pipes must be fixed to prevent movement due to dynamic loads;
- c) The minimum diameter of chemical storage system piping shall be 150 mm.
- d) Storage tank overflow/drain lines shall be sized to carry the cumulative maximum flow associated with the process inlet line(s).

Except for control valves, valve sizes shall match the diameter of connected piping. Manual Actuators on 5-centimeter (cm) and larger valves shall be gear type. The use gear type actuators for valves that are DN 200 and larger for low pressure applications is acceptable.

When valves are located above the trench grating, they shall be furnished with geared (manual and motorized) actuators.

Valves located beneath trench grating shall be furnished with geared actuators. Openings shall be provided in the grating to allow an access to the operating nut with a valve key.

All outdoor valves and valve operating mechanisms should have proper IP rating and corrosion protection covers supplied.

Manual valves located more 2 meters above finished floors or grade levels shall be provided with geared actuators with duplex stainless steel (PREn Number higher or equal than 40), and with safe permanent access for maintenance. Buried valves shall be enclosed in concrete vaults or in valve boxes with cast iron frames and covers.

Automatic flow and control valves shall be furnished with electric motors. All automated valve actuators shall be provided with OPEN/CLOSED limit switches, with feedback to the control system for status indication. Modulating actuators shall be provided with position feedback. Local control stations shall be provided incorporating LOCAL/OFF/REMOTE control selector switches and OPEN/STOP/CLOSE pushbuttons for manual valve control in LOCAL mode.

All pressure piping shall be rated at a minimum of 150 percent of its design maximum operating pressure and shall be fully restrained. The method of restraint shall be in accordance with the

pipe manufacturer’s recommendation. The use of thrust blocks shall not be allowed. All pressure pipes shall be pressure tested to at least 3.5 bars above the design working pressure.

The Contractor shall provide pipe-coating systems and/or cathodic protection to protect buried metallic pipes from corrosion. Dissimilar metals shall be isolated for protection against electrolysis. The Bidder shall demonstrate that adequate corrosion suppression is provided.

Piping beneath concrete slabs or structures shall be encased in concrete with a minimum of 0.2 m cover. Buried gravity piping shall be sloped uniformly without sags or crests. Minimum cover over buried pipe shall be 1.0 m. All process piping shall be installed with 20 mm vents and drains at pipe high and low points, respectively. Valves and hose connections shall be installed to match the service.

All vent valve outlets should be piped to site drains or appropriate drains.

3.8.2.3 RO Process Piping

All RO membrane train feed piping and fittings shall be made of super duplex stainless steel of PREn number of 40 or higher. All welds shall be butt type with 100 percent penetration. All stainless-steel assemblies shall be pickled and passivated following welding, and then electro-polished until a homogeneous, polished finish is attained. Connections from the pressure vessel feed/concentrate ports to the pipe manifolds shall be via 90-degree ell weldments with grooved pipe couplings on both ends. The use of fabricated ells will not be permitted. Permeate manifold connections to the pressure vessel permeate ports shall be made using Schedule 80 PVC U-bends, with a union at the connection to the vessel and a grooved pipe coupling at the connection to the manifold. Machine grooves in other PVC piping will not be allowed.

The RO feed piping pumps and controls shall be designed such that they can withstand pressure surges of at least 2 times the normal operational pressure of the respective piping. The Bidder shall install surge protection equipment such as rupture disks and design the piping such that pressure surges, such as these caused by equipment failure, loss of power, power surges, human error or other water conveyance interruptions do not result in damage of equipment, piping, RO membranes, or other plant components.

3.8.2.4 Chemical Process Piping

Chemical transfer and injection piping shall be run on a non-metallic framing system above grade. High points in injection lines, between the metering pumps and injection point are not permitted. All chemical injectors shall be located at the bottom or the side of pipelines. All chemical lines where the chemicals may cause harm to operators or damage to equipment if spilled shall be run in secondary containment piping systems external to containment areas.

Acid and caustic lines shall not be combined into one secondary containment – but routed separately.

Transparent enclosures made of Plexiglas or other chemically resistant material shall be installed at injection locations and in containment areas around metering equipment for personnel protection. All connections to chemical storage tanks (excluding vent, overflow, and top entry fill connections) shall be furnished with isolation valves connected directly to the tank flange and adequately supported.

Necessary permanent fill, drain, flushing and testing connection shall be provided as required to meet the Operation Service needs for all Chemical services.

The main chemical pump suction outlet line shall be equipped with a motor operated isolation valve which will open when an injection pump starts and close when all injection pumps stop. The Contractor is to select the appropriate valve type.

Piping between the tank connection and valve shall be metallic. All root connections to devices (e.g., calibration columns, pressure gauges, pressure switches, etc.), excluding safety relief valves, shall be installed with isolation valves. Injection line backpressure regulators shall be installed close to the injection point, and shall incorporate block and bypass valves to allow regulator maintenance.

3.8.3 Mechanical Equipment

3.8.3.1 General

Plant mechanical equipment shall be provided with lubrication systems that require not more than monthly attention during continuous operation. Lubrication systems shall be provided with convenient grease and oil fittings and drains that are accessible from the operating floor. Oil lubrications systems shall be furnished with constant-level oilers and oil level indicators.

Rotating parts on equipment shall be enclosed or covered with appropriate coupling guards of stainless steel construction. Covers shall be designed for ease of installation and removal and shall permit ready access for maintenance. Unless otherwise noted, pumps shall be furnished with mechanical type seals. Seal materials shall be selected for compatibility with the pumped fluid.

3.8.3.2 Chemical Metering Pumps

Pump capacities shall be selected such that the maximum operating requirement is achieved between 40 and 60 percent of the pump average stroke setting. Chemical pumps should have automatic stroke adjustment and should not require manual (operator) adjustments when plant is operated at lower or higher throughput.

3.8.3.3 Other Pumps

All pumps shall be furnished with LOCAL/OFF/REMOTE control stations (in the field or at the control panel). Pumps without a local control station shall have a local mounted LOCK-OUT STOP pushbutton for safety shutdown and emergency stop button. All pumps shall be furnished with a discharge pressure transmitter, pressure gauge and high-pressure switch to provide alarm shutdown.

In-line pumps shall be furnished with suction gauge and switch as well. Pumps located in a clear well or taking suction from an above grade tank, shall be protected by low-level switches.

Pumps should have Y-type suction strainers to prevent damage to pumps from any objects that may be left-over from the construction phase. It should be possible to remove the strainer baskets (where appropriate) to reduce pressure drop and improve operational efficiency after initial period of operation.

3.9 Electrical and Instrumentation Design Criteria

3.9.1 Governing Codes and Standards

The Contractor is ultimately responsible for the identification, implementation and compliance with all design and construction criteria, codes and standards applicable to this Project. The equipment, materials, installation, and other work shall conform to all applicable regulations, standards, specifications, and codes, which are current as of the date of the final generation of contract documents. As per the latest edition BS 7671 of the IEE wiring regulations. Both National and International Standards apply to this project. Where there is conflict National Standards to take precedent.

3.9.2 Instrument Installation Requirements

A list of key instrument installation requirements, pertinent to this project, is presented below.

- a) All Instruments Shall be Installed in Boxes with Transparent Cover at the Front.
- b) Instrument installations shall conform to all applicable standard and manufacturer specifications and warranty requirements.
- c) Instrument installation materials, tube, tube fittings and manifolds shall be standardized throughout the project to reduce spare supply inventories and minimize rework time for replacement.
- d) Instrument hardware manufacturers shall be selected during the preliminary Project design phase and shall be submitted for approval by the Employer.
- e) Junction boxes shall be mounted accessible from floor or platforms and junction box doors shall be able to open without interference with personal access or other clearances.
- f) All instruments shall be mounted at a working level between 1.0 and 1.5 meters above the operating floor. Instruments shall not be mounted on handrails or on a wall which may vibrate or oscillate.
- g) All process indicators and indicating transmitters shall be mounted in position, which is readable by a Bidder without requiring the use of a ladder or the building of platform.
- h) Temperature and pressure instruments capillary sensors shall be installed and clamped in tube racks on one-inch aluminium channels. Excess capillary tube shall be coiled and clamped to the mounting stand below the instrument.
- i) Where the process indicator is not visible blind pneumatic field transmitter installation shall be provided with a test connection on the transmitter output for use with a portable test gauge.
- j) All transmitters shall have IP65 protection rating.
- k) Instruments located near each other shall be grouped to the maximum extent possible on a common mounting stand, wall bracket or instrument rack.
- l) Instrument impulse lines shall incorporate a blow down leg or contamination accumulation leg for the removal of dirt and moisture.
- m) Instrumentation taps to process lines shall be isolated by root valve at the point of connection. Isolation valves for taps to process lines shall be 1/4-turn ball valves of materials compatible with the process fluid. Isolation valves for chemical service shall match isolation valves used in other portions of that chemical piping.
- n) Critical instrumentation associated with seawater inlet, brine discharge, Potable Water quality or other critical process parameters shall be duplicated and shall not use the same impulse line but have separate process tapping.
- o) Analysers for primary process lines shall be installed in bypass assemblies external to the main process headers to allow routine maintenance. The assemblies shall include an isolation valve at each process connection tap, pressure regulator; manual sample valve; flow meter with integral flow metering valve, check valve, miscellaneous piping and fittings. Assemblies for analyser sensors, which must remain wetted at all times (e.g., pH or conductivity sensors) shall incorporate a vacuum breaker in the drain piping. Sample drain shall be routed to a hub drain. Drains shall not be routed to a storm water system.
- p) Each switchboard shall be type tested assembly of switchgear and control gear protection against direct contact, insulation of live parts as defined in BS 5486.
- q) Final testing and commissioning of entire electrical installation by chartered electrical engineer and submit the certificate as per BS 7671.

3.9.3 Installation of Cables

- a) All cables laid below surface level or in trenches are to be installed in PVC conduits and these conduits are to be sealed to prevent the ingress of moisture or water even if submerged.
- b) Cables carrying electricity and cables carrying digital communications must be laid in separate conduits to prevent electro-magnetic interference.

3.10 Design Standardization

The Contractor shall ensure that like equipment items are made by the same (reputed) manufacturers throughout the Works to minimize spares inventory. Variations from this requirement shall only be allowed by specific approval of the Employer. Contractor preference shall not be justification for failure to comply with this requirement. Only sound, engineering supported justifications will be considered.

3.11 Spare Components and Maintenance Equipment

Spare components shall be provided for all critical equipment where delivery of such components to the SWRO Desalination Plant site would require two weeks or more. In addition, the Bidder shall submit a list from each vendor of equipment of suggested spare parts for three years of operation. All components on this list shall be furnished prior to initiating plant start-up activities. For the SWRO Desalination Plant component spares and maintenance equipment furnished by the Bidder shall include, but not be limited to, the following:

- a) For all process pumps, one complete set of bearings, one complete set of wear rings, one complete set of mechanical seals, one mechanical seal maintenance kit, and one complete set of gaskets and O-ring seals.
- b) One complete ERD unit and ERD spares recommended by the ERD manufacturer.
- c) For all chemical pumps, one set of working diaphragms, one set of check valve assemblies, ten indicating lamp bulbs for the control panel, ten internal fuses, and two relays of each type.
- d) One complete chemical pump of each type so that it can be retained as a shop-spare, serviced and kept ready to replace (when required) without a major outage and without need for servicing chemical pumps in-site with the other pumps operating.
- e) For each storage tank, provide one complete set of nuts, bolts and gaskets.
- f) Provide one (1) container of 20 litres capacity each colour and type of paint used.
- g) Provide one spare of each type and size of drive belt used.
- h) Spare parts kit for each size and type of backflow preventer.
- i) Special tools for equipment required for maintenance and dismantling.
- j) Not less than five lamps, fixture globes, and ballasts of each size and type installed. Preferably LEDs should be used and spare LEDs provided.
- k) Two spare photocells for exterior lighting, if used.

The Contractor is responsible for preparing the first-year spare parts list. This list of spare parts shall be submitted with the proposal.

3.12 Social and Environmental Impacts

The Contractor shall comply with the Environmental Impact Assessment (EIA), the Environmental Management Plan (EMP) and the Resettlement Plan (RP) insofar as the

requirements in these documents are the responsibility of the Contractor (Refer Attachment A.2.8)

Briefly the EIA/EMP and RP cover the Design-Build (DB) and Operation Service (OS) Periods. In addition, the EIA/EMP also cover the Intake and Outfall Works, the Treatment Plant Works and the Pipeline and Roads Works. Each of these Periods and each of these Works has different social and environmental requirements.

The Bidders are required to include the cost of compliance with the social and environmental requirements in their bid prices. The social and environmental requirements are listed in tabular form in Chapter IX Environment Management Plan contained in the Environmental Study document (Attachment A.2.8):

It is expected that the most significant cost will come from the monitoring that is required during the Operate Service Period.

3.12.1 Terrestrial flora and fauna

Refer to EMP.

3.12.2 Intertidal and sub-tidal zones

Refer to EMP.

3.12.3 Energy and greenhouse gases

Refer to EMP.

3.12.4 Cultural Heritage

Refer to EMP.

3.12.5 Groundwater

Refer to EMP.

3.12.6 Sediment and Erosion

Refer to EMP.

3.12.7 Storm water Management

Refer to EMP.

3.12.8 Waterways

Refer to EMP.

3.12.9 Hazardous Materials

Refer to EMP.

3.12.10 Waste

Refer to EMP.

3.12.11 Noise and Vibration

Refer to EMP.

3.12.12 Air Quality

Refer to EMP.

3.12.13 Visual Amenity

Refer to EMP.

3.12.14 Traffic and Transport

Refer to EMP.

3.12.15 Social

Refer to EMP.

3.12.16 Contaminated Land

Refer to EMP.

3.12.17 Land Management

Refer to EMP.

3.12.18 Site Rehabilitation

Refer to EMP.

3.12.19 Marine Pests

Refer to EMP.

3.12.20 Local Fishing Community

Refer to EMP.

3.12.21 Marine and Coastal Integrity

Refer to EMP.

3.12.22 Coastal Processes

Refer to EMP.

3.12.23 Marine flora and fauna

Refer to EMP.

3.12.24 Design and Construction (general)

Refer to EMP.

3.12.25 Intake Structure

Refer to EMP.

3.12.26 Outfall

Refer to EMP.

3.13 Commissioning

The following apply to commissioning:

- a) The downstream infrastructure cannot be used for commissioning;
- b) Sufficient infrastructure (such as return pipelines) must be installed to permit full onsite commissioning;
- c) Metering of return lines is required;
- d) Onsite valves and meters are to be connected to the site’s SCADA system;
- e) Pre-treatment and Reverse Osmosis systems will be commissioned at a capacity of 24 MLD. The plant may operate at reduced flow over the first three years of the Operate Services Period at rates in the order of:
 - i. Year 1: 6 MLD
 - ii. Year 2: 12 MLD
 - iii. Year 3: 18 MLD;
- f) Bidder is to provide full details of protocols and chemicals used to preserve membrane inventory when the plant is operating at reduced capacity;
- g) The commissioning may comprise individual component (and/or components) commissioning and a whole-of-system commissioning;
- h) Project components may be commissioned individually or in logical groups as they are completed;
- i) The downstream transmission pipeline is to be commissioned separately and is not included in the whole-of-system commissioning; and
- j) The whole-of-system must be commissioned in full operating mode prior to the issuing of a commissioning certificate.

3.14 Other EPC Matters

3.14.1 Interface to Network

- a) The upstream flange of the Product Water Storage Tank will be the Contract interface point
- b) Product water tank working storage must be at least 10 ML
- c) Level in product water tank will be used as the control point for the supply of desalinated water
- d) Both the Treatment Plant and Network will have access to the SCADA from the product water tank and pump station
- e) Product water storage tank must have a metered overflow return to the waste stream outfall

3.14.2 Maximise Operational Efficiency

Work with the NWSDB to develop joint Plant and Network operational protocols which will maximise the efficient operation of both the Plant and the downstream Network by operating them as one system.

3.14.3 Match Supply to Demand

Work with the NWSDB to develop Plant and Network interface operational protocols which will minimise the wastage of product water by closely matching the supply to the demand.

3.14.4 Peak Demand

Water produced by the desalination plant is not required to exceed the 24 MLD. The product water tank and downstream storages, and possibly groundwater supplies, will be used to damp out the diurnal demand. As the project progresses further work on modelling this system will be undertaken.

3.14.5 End of Operation Service Period

At the end of the Operation Service Period the following are required:

- a) *People*: Ensure that staff from the NWSDB can fully and competently assume the operations and maintenance of the assets
- b) *Assets*: Ensure that the assets are in a condition that would be expected given their respective ages and typical wear and tear
- c) *Systems*: Ensure that all systems, processes and procedures are documented and current and all drawings up to date
- d) *Spare*s: Ensure that adequate spares and other inventory are provided

A Transition Plan (as per Section 16.16) must be available for implementation three years prior to the end of the Operation Service Period.

3.15 List of Contractor's document requiring approval

The Contractor shall obtain the approval from Employer’s Representative for following documents;

- a) Asset Management Plan
- b) Code of Conduct
- c) Commissioning and Acceptance Testing Plan
- d) Communications Plan
- e) Compliance Register
- f) Construction Staging Plan
- g) Construction Works Plan
- h) Corrosion Protection Plan
- i) Data and Information Management System
- j) Durability Plan
- k) Emergency Management Plan
- l) Incident Management Plan
- m) Information Management System
- n) Maintenance Management System
- o) Membrane Preservation Plan
- p) Monitoring and Reporting Plan
- q) NWSDB Staff Capacity Building Plan
- r) Operate Service Plan
- s) Project Management Plan
- t) Quality Management Plan
- u) Risk Management Plan
- v) Safety Management Plan
- w) Security Management Plan
- x) Site Plan
- y) Staff Roster
- z) Standard Operating Procedures

aa) Potable Water Quality Monitoring and Reporting Manual

CHAPTER 4. SWRO DESALINATION PLANT LAYOUT

4.1 Site Plan

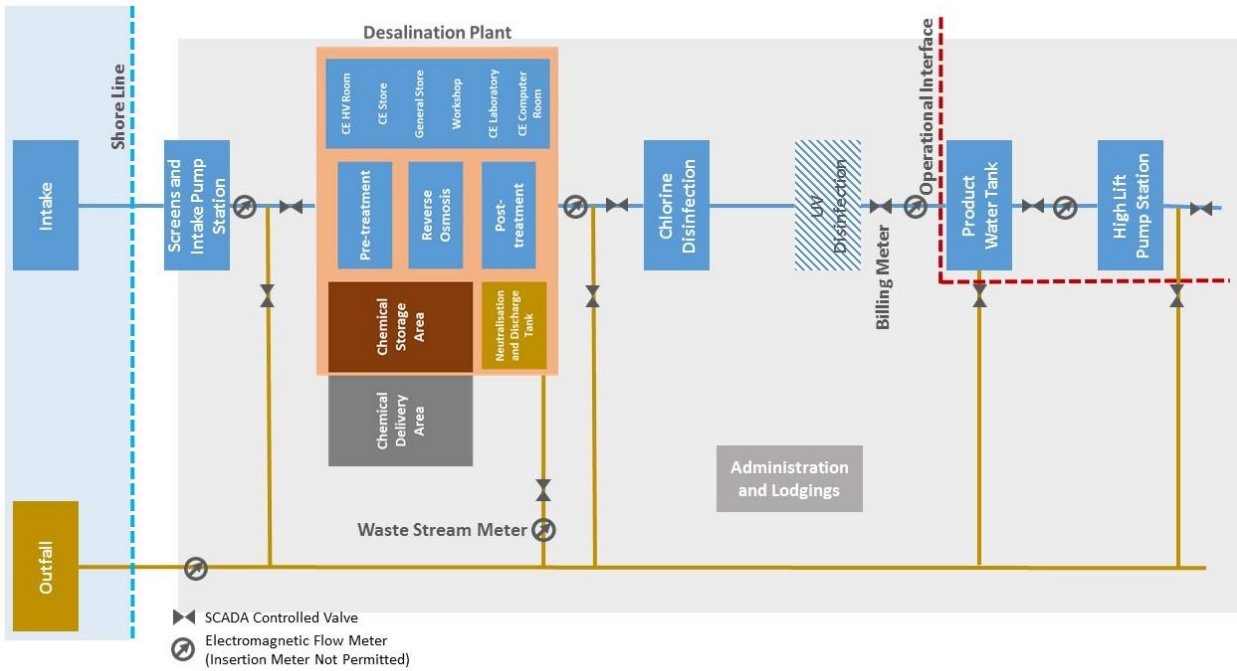
SWRO Desalination Plant site location is depicted in Attachment 2. The site is free from structures. Information regarding the existing vegetation around the parcel of land that constitutes the site is provided in Attachment 2 – Environmental Impact Assessment Report. Bidder shall develop site layout for the 24 MLD plant with future expansion to 48MLD in accordance with the information provided in this section and shall submit this layout with their Proposal. For the preparation of their bidding offer, Bidder shall assume that the shape of the Greenfield plant site is flexible and shall develop the most economically viable SWRO Desalination Plant layout which the Bidder can fit in a site of total surface area not to exceed 40,000 m². In preparation of their bid, the contractor shall assume that the new site has no existing surface or subsurface facilities, structures, buildings and piping which will need to be removed or relocated. A plan and general arrangement (including sectional views) for staging/laydown area for the SWRO Desalination Plant shall also be provided and kept up-to-date by the Contractor.

Topographic and geotechnical surveys of the SWRO Desalination Plant site are provided in Attachment 2. Subsurface hydrogeological conditions (i.e., groundwater level and soil type; soil load bearing capacity; and stratification) of the plant site shall be confirmed by the Bidder during the design phase of the project.

This Site Plan (and general arrangements + sectional views) for the 24 MLD SWRO Desalination Plant shall depict, as a minimum, the following information:

- a) The boundaries of the plant site;
- b) All key permanent on-site structures including but not limited to:
 - i. Intake Pump Station;
 - ii. Source Seawater Pre-treatment Facilities;
 - iii. Reverse Osmosis Building;
 - iv. Post-treatment System;
 - v. Chemical Storage Facilities, and Chemical Unloading Areas;
 - vi. Membrane Flush Tank;
 - vii. Neutralization Tank for Membrane Cleaning Chemicals;
 - viii. Potable water Pump Station and Storage Tank;
 - ix. Electrical Substation and Switch Yard;
 - x. Plant Maintenance Workshop, Equipment and Materials Storage Area and Spares storage facility.
 - xi. Plant Control Area (incorporating Central or Main Plant Control Equipment);
 - xii. All Piping with Diameter equal to or larger than 100 mm;
 - xiii. All flow and/or pressure meters and valves outside of the buildings;
 - xiv. Provision for expansion of the plant to 48 MLD
 - xv. Provision for the addition of second pass membranes for Boron reduction
 - xvi. Provision for a DAF system
 - xvii. Administration Building, Training Centre, & Staff quarters
 - xviii. Roadways and Traffic Circulation;
 - xix. Staging/Laydown Area.
 - xx. Architectural features and arrangements
 - xxi. Sound proof Room for Generator and its control
 - xxii. External lighting
 - xxiii. External security cameras

- xxiv. Site entry and exit points
- xxv. Site emergency exit point



Schematic Diagram for SWRO Desalination Plant

Figure 4.1: Schematic Diagram for SWRO Desalination Plant

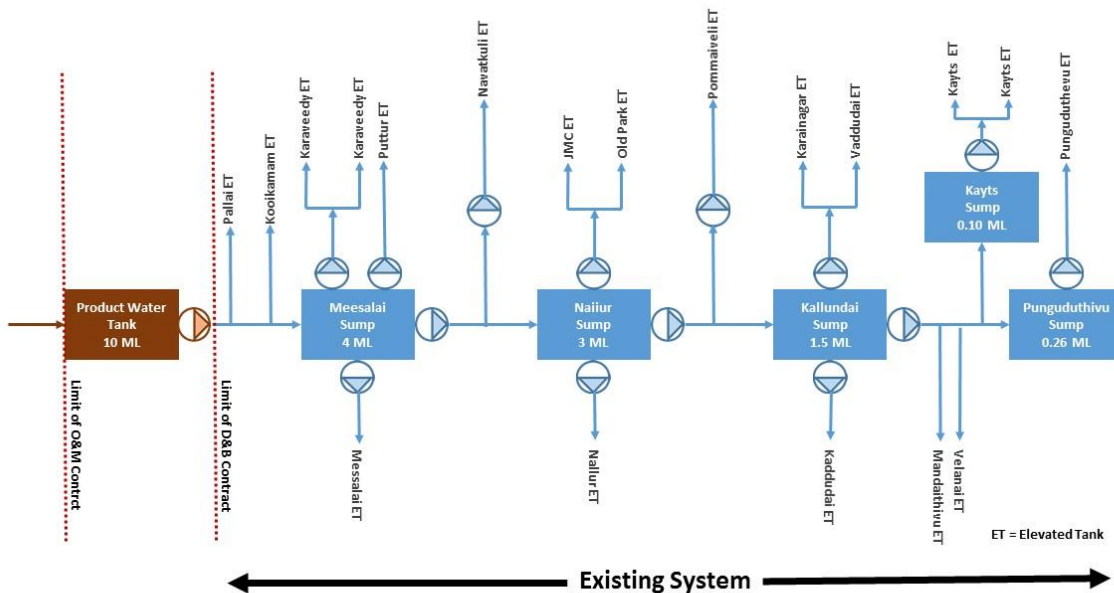


Figure 4.2: Interface of DBO, DB Contract and Existing System

CHAPTER 5. SEAWATER INTAKE SYSTEM

5.1 Works Description

The seawater intake Works shall consist of intake tower, single intake pipeline connecting the intake tower to the SWRO Desalination Plant intake wet well, which shall be located at the plant site; intake pump station; intake pipeline delivering the source seawater to the pre-treatment system, and associated service facilities (electrical substation and instrumentation and control equipment). The conventional intake tower shall have coarse screen and the onshore intake pump station must include intake screens of 3 to 4 mm openings.

The intake system shall be designed with plant recovery rate of approximately 45%. The Bidder may use a different rate but must show why this different rate has been used. The intake works shall be designed and constructed for the future expansion capacity of total 48 MLD Potable Water output.

To prevent the growth of marine organisms in the plant intake and downstream piping connecting the intake to the SWRO Desalination Plant pre-treatment facilities, the plant shall be equipped with dual redundant (duty / standby) sodium hypochlorite system for additional intermittent chlorination of the source seawater, as needed. The Bidder may propose alternative methods and chemicals for controlling excessive bio-growth in the plant intake and pre-treatment facilities and pipelines.

Where sodium hypochlorite is used, the contractor shall store the chemical in black tanks away from direct sunlight to minimise chemical degradation and chlorate production.

5.2 Intake Tower and Interconnecting Pipeline

5.2.1 Intake Structure

The Bidder can use conventional intake tower as intake structure. The intake shall be made of concrete with cupro-nickel grilles to ensure low corrosivity and high durability. The Bidder shall provide the experience detail of the intake structures already used successfully. In their technical proposal, the Bidder shall indicate the locations where they have designed and constructed an intake structure along with project size and contact information (name, phone number and e-mail) for Bidder's clients. (Refer Section 4 Technical Proposal 2.2.2). Seawater resistant cement is to be used in the concrete.

The ocean bottom depth at which the intake structure (intake tower) is located shall be at least 10 meters from the ocean surface at mean sea level. The lowest seawater entrance point of the intake tower shall be at a minimum of 2 meters above the ocean bottom and shall be designed such that it prevents entrance of sand and silt.

The entrance velocity of the water through the intake tower bars openings shall be not more than 0.15 m/s calculated at 50% of the installed water entrance surface area of the seawater screens.

The intake structure shall be supplied with a floating device equipped with a beacon light. The area around the intake is likely to be used for bottom drag net fishing by local fishermen the intake structure shall be designed such that it causes minimum obstruction of fishermen activities.

The Bidders are to provide a brief construction method statement describing the way in which they propose to construct the Intake Structure.

5.2.2 Intake Interconnecting Piping

Source water collected by an intake structure shall be conveyed to an intake pump station located at the SWRO Desalination Plant site via a single intake pipeline or tunnel. The intake pipeline material which can be used for this project is high-density polyethylene (HDPE); or other material which is suitable for the site-specific conditions of the project and with which the Contractor has successful experience in other projects (Refer Section 4 Technical Proposal 2.2.2).

The intake piping must be designed and constructed such that it is completely buried in the ocean bottom such that the surface of the bottom after construction must closely resemble this surface before the installation of the pipelines. The buried pipeline must have a minimum cover of 500mm.

The intake pipelines must be equipped with a system (except "Pigging") for a periodic cleaning to remove the shellfish, which would grow on the inner wall of the intake pipes. The Bidder shall describe what system is proposed for pipeline cleaning and how the system operates. The contractor is only allowed to use intake cleaning method with which they have successful experience on other similar projects (Refer Section 4 Technical Proposal 2.2.2).

The seawater intake system shall be designed in such a manner that it allows to:

- a) Collected adequate amount of source seawater needed to produce drinking water at quantity and quality as described.
- b) Continuously measure, monitor and log the flow rate of the source seawater entering the SWRO Desalination Plant with accuracy of +/- 0.2 % or higher.
- c) Discontinue source water collection if the quality of this water may result in damage of plant treatment processes, equipment and membranes. The design must incorporate a means to achieve a rapid shutdown of the pipeline without an adverse effect on the pipes, pumps and associated fittings
- d) Bypass some or all the source seawater directly to the discharge line if needed in emergencies or unusual source water quality events which may cause harm or material impact on plant facilities and/or staff.
- e) Protect the SWRO Desalination Plant against hydraulic surges in the source water supply pipeline.

Bidders are to provide a brief construction method statement describing the way in which they propose to construct the Intake Interconnecting Piping.

5.2.3 Intake Pump Station

The Contractor shall construct intake pump station to convey the source seawater collected by the intake structure to the pre-treatment facilities. The intake pump station shall be located at the SWRO Desalination Plant site. The site location of the intake pump station, the type, size and number of pumps and pump motors as well as the type of pump motor speed controls (constant

vs. variable speed) shall be determined by the Bidder. Both duty and standby pumps must be provided.

5.3 Process and Equipment Design Criteria

5.3.1 Intake Screens

The SWRO Desalination Plant intake pump station shall have separate mechanical screening equipment (rotating band screens) upstream of the intake pumps with screen openings not larger than 3 mm.

Band screens shall be generously sized with 15% margin for flows and arranged to provide 100% redundancy (duty / standby operation). Under certain seawater conditions, both screens shall be able to operate in parallel and concurrently, if required. Seals shall be provided between the rotating and fixed parts to make sure that raw seawater cannot bypass the band screens.

Band screen material shall be super-duplex stainless steel (PREN greater than 40) of sufficient thickness to prevent abrasive damage from sand or other constituents that may be entrained during monsoon or storm events. Spray jets should be provided to clean the band screen and ensure integrity. Spray water system (including pumping with duty/standby arrangement) should be provided to ensure a highly reliable operation.

Cathodic protection system shall be provided and installed for the band screens to ensure long life and durability.

Any material removed by the screens will be disposed as described in the Environmental Management Plan (EMP).

5.3.2 Intake Pumps

The seawater supply pumps shall be vertical turbine or horizontal centrifugal type pumps. All pump parts in contact with ocean seawater shall be made of super duplex stainless steel (PREN 40). The intake pump control system shall incorporate provisions to automatically close the intake structure connection to the seawater supply line if the pipe has no flow, or the water total suspended solids, turbidity, hydrocarbon content and/or temperature are excessively high. The automatic closure must not result in transients that cause damage to any of the infrastructure.

The intake structure shall be designed and constructed to prevent flooding of the intake pump motors and associated electrical equipment. The pumps shall be protected from running dry. The pump station shall be equipped with crane for pump servicing. To prevent the growth of marine organisms in the intake structure in the pump bay and subsequent discharge piping, provision for intermittent chlorination of seawater shall be incorporated in the intake Works.

The Bidder shall determine the size, construction material, exact location and method of installation of the SWRO Desalination Plant intake pipeline. This pipeline shall be installed within the boundaries of the SWRO Desalination Plant site depicted on Figure 2-1.

5.4 Equipment Specification Data Sheets / Materials of Construction

Seawater intake pump and pipeline sizes, materials, design velocity, design pressure, and pressure rating shall be determined by the Bidder and provided with the proposal in Section 4 2.1.2.

5.5 Process and Equipment Control Strategy

Process and instrumentation diagrams (P&ID’s) and a brief description of the intake system equipment control strategy shall be provided with the proposal. The intake pump station monitoring and control shall be incorporated into the plant control system and data acquisition (SCADA) system and shall include a ultrasonic level sensor, wet well level indicator, pump controller, flow meter and flow recorder, control valves, temperature sensors and indicators, and oil and grease sensors.

The desalination Works intake water quality in terms of turbidity and salinity shall be measured continuously and instrumentation for monitoring and recording of these parameters shall be installed at the desalination Works intake pump station.

Duplicate instruments shall be provided where certain parameters are vital to provide early warning of seawater quality deviation and prevent damage to the downstream plant.

In event of excessive increase in intake seawater turbidity and/or decrease or increase of intake salinity, this instrumentation shall trigger alarms that shall notify desalination Works staff. Additional instrumentation and monitoring provisions, which are required to be provided by the Bidder at the intake pump station include:

- a) Continuous Intake Pump Flow Measurement Devices: The seawater intake pumps shall be equipped with flow meters, which shall record the pumped flow continuously. If the intake flow is discontinued for any reason, including non-routine power Works operations, this shall trigger automatic intake pump shutdown.
- b) Continuous SWRO Desalination Plant Intake Water Temperature Measurement Devices: The seawater intake pump station shall be equipped with instrumentation for continuous measurement of the intake seawater temperature. Any fluctuations of the intake temperature outside pre-set normal limits defined in the SWRO or MF/UF membrane warranties (whichever is lower) shall trigger alarm and intake pump shutdown. This monitoring equipment shall provide additional protection against unusual intake water quality conditions.
- c) Continuous Intake Water Salinity/Conductivity Measurement Devices: The seawater intake pump station shall be equipped with instrumentation for continuous measurement of the intake seawater salinity. Any fluctuations of the intake salinity outside pre-set normal operational limits shall trigger alarm and intake pump shutdown. This monitoring equipment shall provide additional protection against unusual fresh water/surface water streams in the JKWSSP SWRO Desalination Plant’s intake.
- d) Continuous Intake Water Oil Spill/Leak Detection Monitoring Devices: The seawater intake pump station shall be equipped with instrumentation for oil spill/leak detection. Detection of total hydrocarbons in the intake water at concentrations higher than 0.04 mg/L shall activate an alarm and levels higher than 0.1 mg/L shall automatically trigger intake pump shutdown.

This instrumentation and monitoring equipment shall be duplicated and provide redundancy/protection against unusual intake water quality conditions.

CHAPTER 6. PRE-TREATMENT FACILITIES

6.1 Works Description

Pre-treatment facilities shall be provided ahead of the RO system to protect the integrity, customary length of the useful life and the consistent performance of the downstream cartridge filters and reverse osmosis membrane system

6.1.1 Feature of Pre-treatment System

The contractor shall install a pre-treatment system to treat seawater containing the parameters presented in Table 2-1 and 2-2. The quality of the pre-treated seawater will comply with the water quality requirements listed in Table 2-3. The quantity of pre-treated seawater produced will allow continuous operation of the reverse osmosis system at a minimum recovery of 45% and a potable (stabilised permeate) production rate of 24 MLD. Within the limitations contained in the Chapter, the bidder may choose the pre-treatment system.

The pre-treatment system shall consist of a filtration step to remove settleable and suspended colloids and particles. Acceptable systems include “pressured” or “submerged” membrane filtration and “gravity” or “pressurised” granular media filtration.

The contractor will provide three references where the proposed pre-treatment system has been used on desalination plants constructed by the contractor with capacity greater than 10,000 m³/day in the last five years.

Any down time of the pre-treatment system due to filter backwashing, chemical cleaning or any pre-treatment system maintenance will not reduce the 95.9% availability of the desalination plant.

6.1.2 Removal of Algae

The contractor shall make allowances in the civil works to provide space to accommodate a Dissolved Air Floatation (DAF) system to allow continuous operation of the desalination plant during an algal bloom event. The DAF system shall be installed if the occurrence of algal blooms prevents the desalination plant operating at the design availability of 96% and/or complying with the water quality requirements of the pre-treatment system as defined in Table 2-3.

Any DAF clarifier installed on the plant shall be equipped with coagulation and flocculation chambers where ferric sulphate or chloride, acid, and polymer can be added respectively.

6.1.3 Cartridge Filtration

The contractor shall install a set of cartridge filters downstream of the pre-treatment system and upstream of the reverse osmosis feed pumps.

The function of these filters is to protect the reserve osmosis feed pumps and membranes from contamination introduced after the pre-treatment system and/or failure or breakthrough through the membrane filters/granular media filters.

6.2 Pre-treatment System Monitoring

An instrument station equipped with semi-automatic SDI monitors, Redox, conductivity, turbidity and pH instruments will be installed to monitor quality prior to the reverse osmosis membranes.

The filters will be equipped with a differential pressure meter with high differential pressure alarm.

UF Filtrate Pumps, UF Backwash Pumps, UF Scour Blowers and other Equipment shall be monitored.

All ancillary equipment should be arranged on duty/standby and provided with a VSD to ensure efficient operation.

Pre-treatment Process Calculations

Bidder shall provide process calculation for the pre-treatment equipment to guarantee long-term performance and durability.

Granular media filters and membrane filters shall be backwashed automatically. Filtered water stored in the filtrate storage tank shall be used for filter backwash. Filter-to-waste valves and filter drain valves shall be provided for filter cleaning and drainage. If a membrane pre-treatment system is used, the periodic chemical membrane cleaning (i.e., clean-in-place - CIP) shall be completed with RO permeate rather than UF filter effluent.

The structural integrity of all filter cells shall be preserved by applying protective coating to the structure suitable for seawater applications. The filter cell structures shall be designed of materials which have useful life of 50 years.

An in-line turbid meter shall be installed downstream of each granular media filter/membrane filter producing final filter effluent. For the minimum pre-treatment filtrate water quality requirements see Table 2-3.

An overflow system shall be provided at each filter cell/filter train. When water level inside a filter cell reaches a pre-set high level, water would flow over an overflow weir into a pipe and will be conveyed to the plant discharge line for disposal.

The filtered seawater shall be de chlorinated by addition of sodium bisulphite to protect the RO membranes from damage. The sodium bisulphite addition system shall be designed to be able to inject this chemical both upstream and downstream of the plant cartridge filters. An anti scalant feed system shall be provided with a point of introduction downstream of the point of addition of sodium bisulphite.

Bidder shall design and provide description and layout of the proposed pre-treatment system and all chemical feed systems, service and auxiliary facilities.

6.3 Process and Equipment Design Criteria

Proposal shall contain key process and equipment design criteria for each of the components of the pre-treatment system. The proposed pre-treatment system design shall comply with the requirements described below. The system shall be designed such that adequate space is provided for the pre-treatment facilities of the 24 MLD plant to be expanded to the ultimate plant capacity of 48 MLD. Space shall be reserved for the expansion of the service facilities of the pre-treatment system as well, including backwash system; filter effluent transfer pumps; the CIP

system and micro screening facilities if membrane pre-treatment is proposed, and the chemical feed systems.

6.3.1 DAF Clarifiers

Provision for a DAF system must accommodate a DAF clarifier that is equipped with coagulation and flocculation chambers where ferric sulphate or chloride, acid, and polymer can be added respectively. As indicated previously, DAF clarifiers shall be designed such that the raw seawater can be conveyed for treatment directly to the second-stage system.

6.3.2 MF and UF Filters

If pressure-driven filters are proposed to be used in directly coupled configuration, the maximum pressure rating of the filter fibres shall be higher than the maximum feed pressure of the pre-treatment train feed pumps and in no case such pressure rating shall be less than 6 bars. The Bidder shall explicitly state the pressure rating of the proposed MF or UF membranes and the average and maximum feed pressure of the membrane pre-treatment feed pumps in their proposal, along with key design criteria for the pre-treatment system including but not limited to:

- a) Type and model of the pre-treatment membranes (membrane modules);
- b) Number of membrane pre-treatment trains and individual membrane modules per train;
- c) Average and maximum feed pressure of the pre-treatment trains;
- d) Pressure rating of the pre-treatment membranes;
- e) Design average and maximum membrane fluxes in litres per square meter per hour (MH);
- f) Plan and layout of the membrane trains;
- g) Design criteria of the membrane pre-treatment CIP system and filter backwash system.

6.3.3 Micro screens

The self-backwashing micro-screens shall be located downstream of the DAF clarifiers (if required) and upstream of the membrane pre-treatment system. The appature rating of the micro-screens will be determined by the warranty requirements of the membrane filter manufacturer. No micro-screens are needed if Bidder proposes to use granular media filtration system. The following design information shall be provided with the Bidder proposal:

- a) Type and model and size of the micro screens;
- b) Number and configuration of the micro screens;
- c) Minimum, average and maximum feed pressure of the micro screens;
- d) Material of the micro screen internals – is has to be either plastic or super duplex stainless steel of PREN of 40 or more;
- e) Design average and maximum flow through the micro screens;
- f) Plan and layout of the micro screen installation;

6.3.4 Gravity Granular Media Filters

If gravity granular media filters are proposed to be used by the DBO Contractor, the following minimum requirements shall be fulfilled:

- a) Dual or Three Media Filters with Total Filter Media Depth of 1.6 meters or more;
- b) Filter media with uniformity coefficient of 1.3 or less;
- c) Anthracite with specific gravity of 1.5 to 1.6 tons/m³ or pumice with specific gravity of 1.1 to 1.2 tons/m³ shall be used;
- d) Sand with specific gravity shall be 2.57 to 2.67 tons/m³;
- e) Garnet with specific gravity shall be 3.8 to 4.1 tons/m³;
- f) Air/Water Backwash;

- g) Rinse to Waste Provisions;
- h) Filter Cells and Effluent Wet Well Covered with Removable Covers or Roof.

The filter type, size and configuration shall be determined by the Bidder and shall be described in the proposal. The filters shall be provided with air-water backwash system. Constant rate filters shall be used for this application. Declining rate filters are not acceptable. The filter cell structures shall be constructed of reinforced concrete with filter wall coating to prevent entrance of seawater into the structure through micro-cracks and loss of structural integrity of the filters.

Filters shall be backwashed automatically. Filtered water shall be used for filter backwash. Backwash wastewater from the filters shall flow by gravity into an equalization basin. Filter-to-waste valves and filter drain valves shall be provided for filter cleaning and drainage.

6.3.5 Pressure Granular Media Filters

If pressure granular media filters are proposed by the Bidder, the following minimum requirements shall be fulfilled:

- a) Dual or Three Media Filters with Total Filter Media Depth of 1.2 meters or more;
- b) Filter media with uniformity coefficient of 1.3 or less;
- c) Anthracite with specific gravity of 1.5 to 1.6 tons/m³ or pumice with specific gravity of 1.1 to 1.2 tons/m³;
- d) Sand with specific gravity shall be 2.57 to 2.67 tons/m³;
- e) Garnet with specific gravity shall be 3.8 to 4.1 tons/m³;
- f) Air/Water Backwash;
- g) Rinse to Waste Provisions;

The filter type, size and configuration shall be determined by the Bidder and shall be described in the proposal. The filters shall be provided with air-water backwash system. Constant rate filters shall be used for this application. Declining rate filters are not acceptable. The filter cell structures shall be constructed of plastic, rubber or epoxy-lined steel.

Filters shall be backwashed automatically. Filtered water shall be used for filter backwash. Backwash wastewater from the filters shall flow by gravity into an equalization basin. Filter-to-waste valves and filter drain valves shall be provided for filter cleaning and drainage.

6.4 Equipment Specification Data Sheets/Materials of Construction

In their offer, the Bidder shall provide Equipment Specification Data Sheets / material of construction and the followings;

- a) For each component of the pre-treatment system, including but not limited to the type/model, number, size and configuration of individual units/modules
- b) Type, number of units and size of equipment and systems servicing the pre-treatment facilities (i.e., blowers, pumps, chemical cleaning system, etc.)
- c) For all pumps, please provide information of the level of detail presented in table of Section 4 - 2.1.3

6.5 Process and Equipment Control Strategy

The operation and control philosophy for the pre-treatment system shall be illustrated on a separate P&ID/s developed for this system to be submitted as part of bid. A brief description of the proposed pre-treatment system equipment control strategy shall be included in the proposal. Some general directions regarding this strategy are as follows;

- a) A level transmitter shall be installed in the clear well to prevent the feed transfer pumps from starting if the level in the clear well is too low (if gravity granular media filters are used). The flow rate from the discharge of the feed transfer pumps shall be controlled automatically by the permeate flow control of the RO trains.
- b) All chemical feed dosing rates shall be set by the plant Bidder via the plant central control panel. The flow controller on the discharge of the seawater supply pumps shall automatically regulate the coagulant, flocculants and acid dosing rates in proportion to the feed flow rate.
- c) Turbidity of the feed seawater and the filtered water shall be monitored continuously. If turbidity exceeds the limit set by the Bidder, an alarm shall sound to alert the Bidder.
- d) A bypass line shall be provided on the feed header to the RO trains. This bypass line shall be used during the start-up and operation of the pre-treatment system. Flow from the pre-treatment system shall be diverted through the bypass line until it is confirmed that the RO feed water SDI and turbidity are within the acceptable range (see Table 2-3). The feed water bypass line can also be used to divert feed water away from the RO units if oxidizing agents are detected in the RO feed or if the feed water turbidity, pH, temperature or other parameter established as a trigger to void the RO membrane warranties by the membrane supplier/vendor exceeds the maximum allowable value for a predetermined time as defined in the RO warranty agreement.
- e) The pre-treatment system shall have provisions for operation on Automatic, Semi-automatic and Manual modes.

CHAPTER 7. REVERSE OSMOSIS SYSTEM

7.1 Works Description

The RO System shall meet the potable water quality requirements specified in Table 2-4 and the performance criteria described in Section 15 of this Employer's Requirements. The criteria presented herein and in other sections of this document are intended to provide general guidelines and establish minimum system requirements for configuration and materials of construction only. It is the responsibility of the Bidder to design a system, which meets all criteria defined in this document.

The RO system building and service facilities should be planned such that adequate space is provided for the expansion of these facilities from 24 MLD to 48 MLD, and cater for a second pass to remove Boron.

Main system requirements are as follows:

- a) The system shall use the RO membrane process for desalination.
- b) The RO membrane system shall be a single SWRO pass Works. However, space shall be provided in the RO system area to install a second pass with capacity to process permeate to achieve a boron concentration of 1.0 mg/L in the product water if required at a future date. In addition, space shall be reserved near the RO system to upgrade its capacity to 48 MLD.
- c) Installed potable water production capacity of the RO system shall be 24 MLD and the system shall consist of four (4), 6 MLD RO trains capable to operate at the same efficiency. The RO system of the 24 MLD plant shall be capable of continuous operation and production of drinking water of flow rate between 6 MLD and 24 MLD.
- d) Primary system operating cycles (start-up, steady state operation, shutdown, flushing, etc.) shall be fully automated.
- e) System treatment components shall be arranged in parallel modular units (e.g., individual RO membrane trains or sub-units), each of which shall be capable of operating independently of the other units. Alternative membrane configurations may be proposed by the Bidder if they benefit the system reliability and costs.

Information establishing the proposed basis for system design shall be provided with the proposal.

7.2 Process and Equipment Design Criteria

The RO system shall include the following components as a minimum but not limited to:

- a) RO Feed Water Conditioning Facilities and Instrumentation and Controls to Protect the Integrity and Useful Life of the RO Membranes;
- b) RO Membrane Trains;
- c) Membrane Cleaning System;
- d) Membrane Flushing System;
- e) Isobaric Pressure-exchanger type Energy Recovery System.

Specific requirements for each component are provided below. The listed requirements are intended as minimum guidelines. The Bidder is encouraged to augment and expand the proposed facilities to optimize the process.

7.2.1 RO Feed Conditioning Facilities

Intake seawater shall be pre-treated prior to RO desalination as described in Chapter 6. As indicated in this chapter, seawater pumped to the RO system shall be conditioned to remove residual oxidants, prevent scale formation of the membrane elements, and provide a final barrier against incidental particulate breakthrough from the pre-treatment system. Anti scalant shall be injected to the low-pressure feed stream to prevent the precipitation of sparingly soluble salts in the RO concentrate stream. The feed water to the SWRO system shall be treated with sodium bisulphite feed system at any time when the oxidation-reduction potential in this water exceeds 250 mV.

The retention of final particulate barrier contained in the pre-treated water shall be achieved through cartridge filtration. Installation of cartridge filtration system if granular media filters are used is compulsory.

The proposed dosages, type and locations of water conditioning chemicals shall not contradict the standards of the RO system membrane manufacturer as documented on the RO membrane supplier guarantee. System design shall incorporate the listed facilities, as well as any additional facilities required to guarantee compliance with the accepted criteria.

7.2.2 RO Membrane Trains

The core RO treatment system equipment shall be arranged in four (4) discrete membrane trains of individual production capacity of 6 MLD total installed water production capacity of 24 MLD and shall be designed to produce between 6 MLD and 24 MLD of potable water per day. The RO trains shall be designed in such a manner that the 24 MLD plant can be operated as four (4) individual (independent) 6 MLD trains if required to meet lower capacity.

For the purposes of this document, a train is defined as a stand-alone modular unit incorporating a high pressure feed pump, pressure vessels with membrane elements installed on racks, vessel manifold piping, permeate header, concentrate header with flow control, associated instrumentation and valves. To fit this definition, a train must be capable of independently controlling total permeate and concentrate flows through the train; and all parallel feed/concentrate staged vessels within the train must operate continuously during normal operation.

The RO membrane desalination system shall be designed and constructed to meet the following requirements but limited to:

- a) The RO system configuration shall allow achieving flexible and cost effective plant operation to meet potable water quality specifications defined in Table 2-4 of this Employer's Requirements.
- b) To improve energy efficiency, the SWRO system shall be equipped with pressure-exchanger (isobaric type) energy recovery system – the only type of such system allowed to be used for this project is the PX type pressure exchangers manufactured by Energy Recovery Incorporated, USA or equivalent.
- c) Each SWRO train shall be equipped with an individual energy recovery unit.
- d) The RO system design shall be based on the use of spiral-wound, polyamide composite type membrane elements. Suitable RO membrane products of standard 8-inch diameter by 40-inch length from the following manufacturers are acceptable to be used for this project: Dow Chemical - Filmtec (USA), Hydranautics (Japan), and Toray (Japan) or equivalent.
- e) The average design SWRO membrane flux of the SWRO elements per pressure vessel shall not exceed 14 Lmh with all four RO trains in operation and RO train production capacity of 250 m³/hr.

- f) In addition, the SWRO elements shall achieve the net guaranteed Potable Water capacity over the full life of the RO membranes i.e. there shall be no reduction in net Potable Water delivery capacity per 6 MLD train due to ageing of the membranes within the guaranteed membrane life of up to 7 years.

To facilitate the stocking of spares, operations, and maintenance, the capacity and design of each individual train shall be identical. Design operating pressures shall be established by the Contractor.

In addition, the RO system shall be designed to allow future incorporation of up to 10% more efficient or 10% higher recovery 8-inch RO membranes with minimum or no change of other hardware.

Potable water from the RO system shall be conveyed to the plant permeate conditioning system, which includes alkalinity and hardness addition and disinfection. Concentrate and all other waste streams from the RO system shall be conveyed to the discharge pipelines.

7.2.3 Membrane Cleaning System

The Contractor shall furnish a permanently piped clean-in-place (CIP) system to allow cleaning of membranes in each RO train in-situ. Cleaning solutions shall be prepared in a cleaning solution storage tank(s) and pumped through the vessels of the train being cleaned via dedicated solution feed and return pipe headers. Train piping manifolds shall be designed to allow isolation for cleaning of individual vessels within the train in discrete blocks.

The capacity of the installed cleaning solution storage tank(s) shall be sufficient to clean all vessels within the largest single train from a single batch of prepared solution. In addition to the cleaning solution feed and return connections on the feed/concentrate manifolds of each train, individually isolated return connections shall be provided on the permeate header of each train to recycle permeate created during cleaning back to the cleaning solution storage tank(s). The system shall be designed to mix and recirculate a range of alternate cleaning chemicals made up with RO permeate.

The Bidder shall define the water quality and/or equipment performance criteria, which will be used to decide when to clean the RO membranes and the anticipated frequency of RO membrane cleaning.

The Bidder shall submit a list of cleaning chemicals which are recommended to be used and shall include all facilities necessary to prepare the membrane cleaning solutions in the Proposal.

7.2.4 Membrane Flushing System

The RO system shall include a permanently piped membrane flushing system, to automatically flush vessels of the RO trains within 30 minutes of shutdown to remove residual concentrate or as stipulated in the RO membrane warranty. The flushing shall be accomplished using RO system permeate which does not contain post-treatment chemicals. Flush water shall be stored in an on-site tank of sufficient capacity to flush all installed trains without concurrent refill.

7.3 Equipment Specification Data Sheets /Materials of Construction

The Bidder shall provide key design criteria (number, type and size of units) for the following system components:

- a) Cartridge Filters;

- b) Antiscalant chemical addition system;
- c) RO High Pressure Feed Pumps;
- d) RO Trains;
- e) Membrane Clean-in-Place (CIP) System;
- f) Membrane Flushing System.

7.4 Process and Equipment Control Strategy

The RO system’s main operating sequences shall be completely automated requiring only Bidder response to alarms. General control system requirements are included in Chapter 13. The Bidder shall design and implement a control system to provide the required functionality. Specific considerations for individual system components are discussed below.

7.4.1 Pre-treatment Facilities

Control of pre-treatment facilities and monitoring of performance shall be carried out automatically by the control system based on Bidder configurable control set points. The sodium bisulphite system shall be controlled to insure complete removal of chlorine, using measurements of residual and oxidation/reduction potential both upstream and downstream of the injection point. Other monitored parameters shall include cartridge filter inlet and differential pressures, turbidity, conductivity, and temperature. The instruments including sensor bypass assemblies shall be mounted on a common duplex stainless steel or plastic framework and panel assembly. A sample port assembly shall also be provided from which to take silt density index readings.

Configurable alarms shall be provided to alert plant operators on anomalies in the pre-treatment system. The following alarms shall be provided as a minimum:

- a) Cartridge filter high differential pressure;
- b) High feed water turbidity;
- c) High feed water chlorine residual;
- d) High feed water ORP;
- e) High feed water temperature;
- f) High feed water pH;
- g) Low feed water pH.
- h) SDI High Alarm

The RO system shall be provided with an automatic feed diversion valve controlled to route off-spec feed water to waste.

Each RO train shall be provided with full operational capability from a local control panel or Plant Control system as required.

7.4.2 RO Membrane Trains

Each train shall be fed, discharge and controlled independently from the other trains and each train shall be capable of being started and stopped from the control system interface terminal(s). Configurable operating parameters shall include the train permeate flow set point and recovery set point. Automated control sequences shall be developed for starting up individual trains, monitoring train performance during operation, shutting down trains (under both emergency and non-emergency conditions), and flushing trains. The control system shall be configured to allow operators to select individual trains for operation; or input an overall system set point, designate trains available for operation and allow the control system to determine trains for operation.

The system shall receive status feedback from all controlled devices (e.g., ON, REMOTE, OPEN, CLOSED, etc.) to confirm that all devices are in the correct operating mode and that requested control actions are successfully implemented. System operation shall require that all associated devices are in the REMOTE or AUTO operating modes prior to system start or continued operation.

Train permeate flow shall be controlled by varying the speed of the high-pressure feed pump to achieve the selected permeate flow set point. Train recovery shall be controlled by controlling concentrate flow to a set point derived from permeate and recovery set points through modulation of the energy recovery system or train concentrate control valve (as applicable). Additional automated flow valves shall be provided for each train as follows:

- a) Feed water inlet valve on the suction side of the high-pressure feed pump;
- b) Flush inlet valve on the suction side of the high-pressure feed pump;
- c) Permeate isolation valve on the train permeate header;
- d) Permeate dump valve on the train permeate header (configured to fail open on loss of power).

Additional valves shall be provided based on the final system design as necessary to permit independent operation and isolation of each train during normal operations.

Minimum instrumentation requirements for each train are summarized in the technical data sheets which the Bidder shall provide with their proposal. Based on the measured parameters, the following Bidder configurable alarms shall be provided as a minimum to prevent continued operation of the train during upset condition:

- a) High feed water pressure;
- b) High differential pressure across an individual bank of pressure vessels;
- c) High permeate flow;
- d) Low permeate flow;
- e) Low concentrate flow;
- f) High permeate pressure;
- g) High permeate conductivity;
- h) Loss of REMOTE or ON/OPEN/CLOSED status from connected devices.

Instruments for each train (including transmitters) as well as local control stations for train motor operated valves shall be mounted on a local panel alongside each train. The panel shall be mounted on stainless steel frame assembly. The bypass piping assembly for the permeate conductivity analyser shall be attached to the lower portion of the frame to facilitate maintenance.

7.4.3 Membrane Cleaning System

The membrane cleaning system shall be initiated manually by the operator from a local control panel, which shall be located near the cleaning tank(s) and recirculation pump. The panel shall house system indicators and alarm lamps as well as controls for the pump and tank immersion heaters. All instrumentation indicators (including gauges) shall be mounted on the panel or the panel support frame assembly.

7.4.4 Membrane Flushing System

Train flushing shall be controlled automatically through the control system to flush individual trains on shutdown. The system shall be configured to allow manual initiation of train flushes as well as stopping a flush in progress. If multiple trains require a flush at the same time the control system shall be configured to flush them one at a time in sequence.

CHAPTER 8. POTABLE WATER POST-TREATMENT FACILITIES

8.1 Works Description

Post-treatment Works have two key components in order to protect public health and to safeguard integrity of the water distribution system.

- (1) Re – mineralization:
- (2) Disinfection.

The permeate produced by the reverse osmosis system shall be conditioned to achieve potable water stability adequate to prevent corrosion of the potable water pipeline and drinking water distribution system, to disinfect the potable water in accordance with the requirements defined in in Table 2 – 4 or Attachment 3 of this document.

Permeate from the SWRO system shall be conditioned with a combination of lime and carbon dioxide or calcite and carbon dioxide (or sulphuric acid) and disinfected with chlorine gas to ensure a safe and non-corrosive water supply.

The potable water after post-treatment shall be stored in a 10 ML working capacity potable water tank. The post treatment system shall be designed such that the water exiting the potable water storage tank meets the water quality requirements stipulated in Table 2-4.

The water from potable water tank will be delivered to designated points in the JKWSSP water supply system via a water supply system including on-site pump station, storage tank and transmission pipelines. The delivery pipeline of the on-site potable water pump station shall be equipped with one main flow meter and one redundant flow meter in bypass configuration connected to the site SCADA system and with totalizers with accuracy of +/- 0.2 % or higher, for measurement of plant production flow and for contractual tariff related readings.

Flow meters and pressure transducers shall also be installed at the points of delivery of the desalinated water to the JKWSSP water supply system to verify the flow produced by the SWRO Desalination Plant and to monitor for potential water losses (including leakage or bursts) along the pipeline route. The flow monitors, pressure transducers and tank level monitors are to be connected to both the network site SCADA systems.

8.2 Re-mineralization

The Bidder may recommend a post-treatment system of their preference and provide a brief analysis of the cost and operational advantages of the post-treatment stabilization system they propose vs the alternative post-treatment method indicated in Section 8.1

8.3 Disinfection

A chlorine gas disinfection system for the SWRO Desalination Plant shall be constructed to deliver concentration of 0.5 to 2.5 mg/l of chlorine into the distribution system. This system shall be installed in a structure to avoid negative impact of direct sunlight on the strength of the solution used for disinfection. This system shall be designed to use commercially available chlorine gas. The chlorine gas shall be injected into the permeate line downstream of the point of addition of re-mineralization chemicals and upstream of the plant potable water storage tank.

8.4 Operations, Monitoring and Control Provisions

An on-line chlorine residual analyser and turbidity analyser shall be provided on the potable water transfer line delivering the desalinated water via the potable water pump station from the on-site potable water tank to the JKWSSP distribution system.

The Contractor shall set the desired chlorine residual entering the storage tank based on experience in maintaining target chlorine residual at the point of delivery. A signal from the chlorine analyser on the discharge side of the potable water transfer pump shall be used to control the chlorine gas feed pump.

8.5 Process and Equipment Design Criteria

Bidder shall provide key design criteria for these systems, including the dosages of the permeate conditioning chemicals and the sizes of the key components of the re-mineralization systems – storage tanks, pumps and piping. Bidder shall also include plans and profiles and P&IDs for the re-mineralization and the chlorine gas storage and feed systems. The Bidder shall be responsible to independently determine the chemical dosages required for permeate conditioning.

Operation of the re-mineralization and chlorination systems shall be such that the plant operator can optimize and set the dosing rates. The flow controller on the product transfer line shall adjust the feed rates of all permeate conditioning chemicals based on the flow rate change. Similarly, the residual chlorine analyser shall adjust the chlorine gas feed rate as RO trains are taken into and out of service.

8.6 Equipment Specification Data Sheets / Materials of Construction

Bidder shall provide basic design and performance criteria for all key equipment, structures and facilities included in the re-mineralization and disinfection systems in their proposal.

8.7 Process and Equipment Control Strategy

Re-mineralization chemical dosing rates shall be set to deliver a certain quantity of hardness and alkalinity in the finished water needed to protect the potable water pipelines and water distribution system from corrosion and meet the potable water quality requirements listed in Table 2-4 and Attachment 3. Since the RO system will remove most hardness and alkalinity, the chlorine conditioning dose rate shall be more a function of flow rate than of matching analytical parameters. The carbon dioxide (or acid in the case of the use of calcite contactors) feed rate shall be controlled by a signal from the flow controller on the discharge side of the product transfer pumps. A signal from the pH controller on the finished water product line will be used to make minor adjustments in the carbon dioxide/acid feed rate to maintain target equilibrium pH level. A chlorine residual analyser shall also be provided on the potable water line after the plant storage tank and the information may be used to adjust the sodium hypochlorite feed pump to ensure residual chlorine levels leaving the potable water tank are compliant with Employer requirements (taking account of the residence time and mixing in the potable water tank).

CHAPTER 9. POTABLE WATER STORAGE AND CONVEYANCE FACILITIES (DESIGN & BUILD ONLY)

9.1 Works Description

Potable water storage and conveyance facilities shall include:

- a) One above-ground reinforced concrete potable water storage tank of active storage capacity (minimum working capacity) of 10 ML (10,000 m³)
- b) One on-site pump station to convey the potable water from the 10, 000 m³ storage tank to the potable water delivery point (“Points of Delivery of Desalinated Water to JKWSSP Transmission Line”) specified in Attachment 2 (A.2.5.a and A.2.5.b) of this Employer’s Requirements.
- c) Design, Supply and Laying of Potable water transmission line (DI pipe / Diameter 800 mm) from potable water storage tank of SWRO Plant to Puthukkadu Junction, approximately 8 km (including up to 5% increase in scope).
- d) All required pipework connections, air valves, scour valves, isolation valves, pipe supports, bridge crossings, recirculation lines, drains, vents, instrumentation and necessary works to ensure a functional and reliable system.
- e) Interconnection at the Puthukkadu Junction (where the Potable water transmission line from SWRO Plant to Puthukkadu Junction and the Transmission from Puthukkadu Junction to Sump at Meesalai are connecting).
- f) The connection at the water delivery point shall be carried out using a trenchless method.
- g) All the pipe line traces shall be reinstated to existing condition and the pipe line traces along internal village roads shall be upgraded to 3m width macadam carriage way with 0.5m shoulder both sides.

The potable water storage tank, pump station and conveyance facilities, and associated fittings and instrumentation shall be handed over to the Employer’s Representative after issuance of Commissioning Certificate.

9.2 Process and Equipment Design Criteria / Equipment Specifications

9.2.1 Onsite Potable Water Conveyance and Storage Facilities

The Contractor shall size the potable water storage tank, pump station and delivery pipeline and shall present key design criteria for approval by the Employer. The Contractor shall also prepare a plan and cross-section of the potable water storage tank, showing pipework, valves, drains, overflows, tank instrumentation and pump station.

The on-site potable water pump station shall be equipped with pumps with high-efficiency motors and controlled by variable frequency drives. On-site Pump station building shall be with all required facilities to install 2 X 6 MLD and 3 x 12 MLD high-lift pumps. Initially only 2 X 6 MLD and 2 x 12 MLD Pumps shall be installed.

Each pump shall be designed to run in parallel and each pump shall be able to deliver the designed flow plus or minus 20%, using variable speed drives from the SWRO Desalination Plant to the JKWSSP distribution system.

The fourth pump (called standby or assist – 12 MLD pump) shall also be able to run in parallel to permit the Pump station to deliver up to 36 MLD capacity. In addition, space shall be provided to install a fifth pump to permit (future) increase in discharge capacity to cater for plant expansion up to 48 MLD.

Pumps shall allow smooth start-up and provide up to 20% increase in pumping capacity – should it be required for short-time high demand situations.

The design pressure of the desalinated water at the points of delivery of this water to the JKWSSP potable water supply system shall be as specified in Attachment 2. Potable water pump motors shall be equipped with a variable speed drive (VFD) and shall be designed to be operated in parallel if required.

9.2.2 Off-site Potable Water Conveyance and Storage Facilities

- a) Overall network layout diagram attached in Attachment 2 (From SWRO desalination plant to Sump at Meesalai including the transmission lines to Towers at Pallai and Kodikamam)
- b) Layout out diagram form SWRO plant to Puthukkadu Junction is provided in Attachment 2

9.3 Process and Equipment Control Strategy

The control logic for transfer of potable water for interlocking the RO units with the potable water tank shall be shown on a separate P&ID drawing. A level controller on the product storage tank shall send a signal to systematically reduce the number of RO trains in operation as the water level in the product storage tank increases above a predetermined level (for example 80% to 90% capacity).

This level controller shall also be able to send a signal to increase the number of RO trains in operate as the water level in the product water tank decreases below predetermined level (for example below 50% to 60% capacity) and there is continuing water demand.

During a typical plant start-up, the duty RO trains will be started one at a time. Up to three duty potable water transfer pumps will be in operation for conveying the total production capacity (nominal 24 MLD) from the RO Plant to the points of delivery.

The fourth 12 MLD (standby or assist) pump should be designed so that it can come in as a standby or to further supplement the transfer pump net export capacity up to 36 MLD by operating in parallel with the 2 duty pumps (if required).

Pumps shall be complete with inlet and discharge pipework, valves, controls, instrumentation and a full-flow recirculation line back to the Potable Water tank to allow the pumps to be commissioned and tested prior to pumping water into the Transmission line.

Full functionality should be provided for the Potable Water Pump system and control system should be integrated within the SWRO Desalination plant control system.

Pumps shall be installed in a building and shall be provided with all required facilities, maintenance craneage.

The control system shall be programmed to open the transfer control valve to a certain percent depending on the number of trains online, such that the transfer rate shall be more closely matched to the plant production rate, a specified time increment shall be required to establish steady state conditions.

The Contractor is responsible for the development and implementation of process equipment and the control strategy for the potable water conveyance and storage facilities to ensure all parameters (critical and non-critical) are measured (where possible) using dual-redundant instrumentation.

Contractor shall provide hydraulically modelled strategies, hardware and all required controls to prevent water hammer in the downstream pipeline caused by power failure or sudden trip in valves or any other reason. The water hammer prevention shall include future maximum flow (48 MLD plus up to 20% margin) to design and implement the surge (or water hammer) control devices.

9.4 Road Authority Requirements and Transport of Materials and Equipment

It is a requirement that prior approval of the custodian authority be obtained before commencing any work in roads under their administrative purview. The bidders are required to enquire and be familiar with the custodian authority requirements for design and construction of water pipe in the roads administered under them and allow costs and any other requirements as deemed necessary in the tender proposal to comply with the road authority requirements.

A Provisional Sum is provided exclusively to make payments for refundable deposits and non-refundable supervision estimates of the road custodian authorities.

Refundable deposits shall be made by the Contractor to the road authorities in the name of NWSDB. NWSDB shall receive back the deposit from the road authorities on successful fulfilment of the Contract defects liability by the Contractor.

The Table 9.1 indicates the details of the custodian authorities under which the roads are administered along which the potable water transmission line (DI pipe) from potable water storage tank of SWRO Plant to Puthukkadu Junction, approximately 8 km is laid (Refer Attachment 2 – A.2.5.b).

Table 9.1: Road Details

Road Identification	Chainage		Pipe Diameter (mm)	Road Type	Side (LHS/ RHS)	Proposed Pipe Trace Location	Custodian of the Road / Land along which the pipe is laid
	From	To					
From Plant to “Soranpattu – Thalayadi Road” (New Access Road)	0 + 000	0 + 570	800	As per Sub Clause 3.7.10	RHS	Away from Shoulder /Carriage	Pointpedro Pradeshiya Saba
	0 + 570	1 + 500	800	Gravel	RHS	Away from Shoulder /Carriage way	Pointpedro Pradeshiya Saba
“Soranpattu – Thalayadi Road” to Lagoon	1 + 500	2 + 550	800	Tar/ Asphalt	LHS	Away from Shoulder /Carriage way/ RDA Reservation	Road Development Authority
Lagoon Crossing	2 + 550	3 + 240	800	Tar/ Asphalt	RHS	Away from Shoulder /Carriage way/ RDA Reservation (along lagoon with pipe support)	Road Development Authority
Lagoon to Puthukkadu Junction (A9 Road)	3 + 240	7 + 950	800	Tar/ Asphalt	LHS	Away from Shoulder /Carriage way/ RDA Reservation	Road Development Authority
A9 Road Crossing	7 + 950	7 + 970	800	Asphalt	Across A9 road	Across A9 road (Trench less method)	Road Development Authority

With respect to the pipe trace design, Employer envisage that the custodian authorities require the pipe trace be designed so as avoiding laying in the road carriageways and shoulder as far as possible and requires the trace be located furthest away possible from the road shoulder within the road reservation. Along RDA Roads it is a requirement that pipe should be located furthest away possible; located within the 15m limit from the road centre-line. Indicative locations of the pipe trace are given in the above table for the information of the bidders. Verification of the information given therein shall be the responsibility of the bidders.

Road Development Authority (RDA) conditions for excavation, backfilling, pipe laying, temporary reinstatement and permanent reinstatement of trenches at road carriageway, foot walks, and shoulder, embankment and by-road crossings are given in the Attachment 2 (A.2.6) of the Employer's Requirements. These conditions supersede any relevant details given in the Employer's Requirement of the Contract, if conflicts each other and should be strictly complied by the Contractor during the execution of the Contract.

Backfilling / Temporary reinstatement / Permanent Reinstatement of trenches

Contract requirements for backfilling, temporary reinstatement and permanent reinstatement of pipe trenches falling under different road custodian authorities is described in Attachment 2. The details have been provided under following categories. The bidders are required to be fully familiarized with these requirements and allow suitably in the tender price to complete the backfilling, temporary reinstatement and permanent reinstatement of the pipe trenches as specified.

- a) PS Roads / PRDA Roads
 - i. Backfilling and reinstatement of natural ground - pipe located away from the road shoulder
 - ii. Backfilling, temporary reinstatement and permanent reinstatement of earth shoulder- pipe located on the road earth shoulder
 - iii. Backfilling, temporary reinstatement and permanent reinstatement of macadam road carriageway - pipe located on the macadam carriageway
 - iv. Backfilling, temporary reinstatement and permanent reinstatement of concrete road carriageway - pipe located on the concreted carriageway;
- b) RDA Roads
 - i. Backfilling and reinstatement of natural ground - pipe located away from the road shoulder
 - ii. Backfilling, temporary reinstatement and permanent reinstatement of hard shoulder- pipe located on the road hard shoulder
 - iii. Backfilling, temporary reinstatement and permanent reinstatement of asphalt concrete road carriageway - pipe located on the asphalt concrete carriageway

Transport of Materials and Equipment.

The transport of materials and equipment must be undertaken in compliance with the EMP.

It is possible that some parts of the B402 including the culverts will require some strengthening or repair to permit the transport of materials and equipment to the treatment plant site by the Contractor. A provisional sum has been provided for this. This matter is to be addressed during the design phase of the Contract.

The Contractor is to work cooperatively with the Project Management Unit to ensure the safe transport of materials and equipment.

CHAPTER 10.

CONCENTRATE AND OTHER WASTE DISCHARGE FACILITIES

10.1 Works Description

The Contractor shall provide facilities for collection and environmentally safe disposal of all waste streams generated during the treatment process including the following:

- a) Commissioning water;
- b) Concentrate (brine) from the RO desalination process;
- c) Spent filter backwash water from the pre-treatment filters;
- d) Filter-to-waste water;
- e) RO and spent (used) membrane cleaning solutions and post-flush water generated during CIP;
- f) Sludge from re-mineralization system.
- g) Sanitary wastewater and storm water
- h) Any other waste streams or spills

The plant will generate the following solid waste also;

- a) Spent SWRO membrane
- b) Spent Cartridge Filters
- c) Spent MF or UF Membranes (if Membrane Pre-treatment is used)
- d) Any other solid waste

The volume of all liquid waste streams generated by the SWRO Desalination Plant shall be determined by the Contractor. All the streams listed above except the concentrate from the RO system shall be collected (and treated if needed) in a discharge retention tank. After equalization of the plant waste streams in the tank (and their neutralization if the pH of the mixed water in the tank is outside of the range of 7 to 9), these waste streams will be blended with the RO system concentrate and discharged through an offshore plant outfall equipped with diffusers.

In their technical proposal, the Bidder shall indicate one concentrate and other waste discharge facilities with the locations where they have designed and constructed similar concentrate and other waste discharge facilities as proposed in the Technical Proposal along with project size and contact information (name, phone number and e-mail) for Bidder's clients (Refer Section 4 Table 2.2.4).

The solid waste generated at the SWRO Desalination Plant shall be disposed according to the CEA guide lines (Refer Attachment 3)

10.2 Discharge Retention Tank

The discharge retention tank should be equipped with mechanical mixers or recirculation pumps, pipework and associated controls to keep its content uniformly mixed at all times. This tank will also have feed lines for sodium hydroxide, sulphuric acid and sodium bisulphite to adjust the water quality in the tank in order to meet the discharge requirements specified in Table 2-5 after blending of the mix with the RO system concentrate (and any other waste stream). Dual redundant instrument shall be provided and information displayed to the Operator through the Plant Control system.

The discharge retention tank will have at least two compartments to facilitate periodic cleaning. Additional compartments may be provided to separate the CIP water from the flush water for ease of neutralisation. The retention time and volume of the tank shall be selected such that this

tank can retain the volume of at least two filter backwashes for their sequential duration; the volume of sludge from the lime clarifiers or backwash water from the limestone contactors (if limestone is used for post-treatment), and the volume of spent CIP and flush water of at least two SWRO trains occurring at a time.

The tank volume shall be designed for total design retention time of all waste streams (except for brine concentrate) of at least 2 hours based on 48 MLD Potable Water output (taking care of future expansion).

Discharge retention tank inlet and outlet shall be provided with appropriate instrumentation (dual redundant) of high reliability to measure the inlet and outlet conditions – which shall be provided in real-time to the Operator through the Plant Control System.

10.3 Discharge Outfall

Subject to CEA approval all waste streams generated by at the JKWSSP SWRO Desalination Plant, including the plant concentrate shall be discharged via an offshore outfall with appropriate designed diffusers.

The discharge diffuser system shall be designed and constructed such that the plant discharge is released into the ambient seawater at velocity of 3 to 4 m/s, which will allow complete dissipation of the plant concentrate into the ambient seawater within a nominal 100 meters from the top of the diffuser port.

The configuration of the entire diffuser system, its minimum length and diffuser arrangements shall meet the Environmental performance (initial dilution, near-field and far-field performance outcomes) requirements committed by the Employer through its Concentrate Dispersion Modelling Report included in Attachment 2 of this Employer's Requirements and to the satisfaction of the Environmental Management Plan.

The outfall pipe shall be a single pipe with hydraulic capacity designed to discharge all waste streams generated by a SWRO Desalination Plant of ultimate plant fresh water production capacity of future plant expansion (i.e. 48 MLD, minimum RO system, assuming a nominal recovery of 45%).

In addition, if emergency discharge of any process liquid is required, this shall be allowed for in the sizing of the outfall pipework to ensure that the outfall system maximum design pressures containment is not exceed.

The diffuser ports shall function effectively at recovery rates of 45% (or up to 50% recovery, should recovery rates increase in the future through improved RO technology).

The required minimum distance between the intake and outfall is 300 metres to mitigate any short-circuiting of brine concentrate to the seawater intake.

10.4 Disposal of Solid Waste

The solids waste generated at the plant site will include spent cartridge filters; and spent SWRO membranes. If membrane pre-treatment is used, the plant will not have cartridge filters but will have MF or UF membranes.

The volume of solid waste generated by the SWRO Desalination Plant shall be determined by the Bidder.

The solid waste generated at the SWRO Desalination Plant shall be disposed of by the operator in compliance with the CEA guide lines and Environmental Management Plan. (Refer Attachment 2 & 3)

10.5 Process and Equipment Design Criteria

10.5.1 Discharge Retention Tank

The discharge retention tank volume shall be designed for total design retention time of all waste streams (except for concentrate) of at least 2 hours for 48 MLD capacity. This tank will be configured such that all waste streams are delivered to the tank by gravity.

The flow out of the tank to the ocean outfall will be conveyed by duty/standby pumps, which will be an integral part of the Discharge Retention Tank. The waste streams shall be discharged from the tank into the plant outfall pipeline under pressure matching the pressure of the concentrate discharged from the SWRO desalination system.

10.5.2 Discharge Outfall

The SWRO Desalination Plant will be equipped with a SWRO Desalination Plant outfall capable of discharging the entire volume of all plant waste streams for the ultimate plant production capacity of 48 MLD.

The outfall will be installed at a minimum distance of but near to 500 meters from the shore and its last portion (at 50 to 100 meters) will be equipped with diffusers to discharge and disperse the concentrate into the ambient ocean water. Because initially the plant will be constructed for 24 MLD production the discharge diffusers shall be configured such that some of them may be capped in order to maintain adequate exit velocity from the diffusers at low plant production flows.

Concentrate discharge pipe will be made of corrosion- and crush-resistant material and up to its last portion with diffusers it shall be buried under the ocean bottom with a minimum coverage of 500mm in order to prevent potential impact of the discharge structure on the local small-scale commercial fishing activities.

Except for its last section containing the diffusers, the pipeline shall be installed in a covered trench or via directional drilling with a minimum cover of 500 mm below the existing sea floor recognising the sediment profile along the outfall route (see Attachment 2).

HDPE should be used for the outfall. Alternate materials may only be considered with which the Contractor has successful experience in other projects (Refer Section 4 Technical Proposal 2.2.2) and if Contractor provides an extended warranty of 7+ years for workmanship and full design life guarantee.

The outfall pipeline should be designed to maintain velocity of 1 m/s or more in order to prevent formation of deposits and scale on the inner surface of the pipes. Pipe size and velocity shall be determined by the Bidder.

Outfall pipe will terminate with a multiport diffuser, which will be designed so that the end of the transport pipe is capped and the last sections of the pipe contain lines of small ports (openings or

diffuser nozzles around the circumference of the pipe). The purpose of the diffuser is to provide a greater initial dilution of the concentrate as it enters the surface water.

The optimum configuration of the outfall diffuser system shall be developed by the Contractor in consultation with the Employer and (if required by the Employer) with Employer’s specialist hydrodynamic modelling Consultants.

The diffuser design shall be consistent with the findings and recommendations of the Concentrate Dispersion Modelling Report included in Attachment 2 of this Employer’s Requirements. The diffuser system design shall incorporate the following key features:

- a) The actual exit velocity from diffuser shall be determined by the Bidder based on the force needed to eject the desalination concentrate at least 1 metre below the surface of the ocean, which allows to maximize the concentrate mixing/contact time with the ambient water column and to engage the largest possible volume of ambient water in the mixing process. The diffuser jet shall not break out of the ocean surface.
- b) The diffuser system shall be placed perpendicular to the prevailing ocean current. The distance between ports shall be selected such their individual discharge plumes do not overlap.
- c) Diffuser ports shall have sufficient diameter in order to prevent their blockage.

10.6 Equipment Specification Data Sheets / Materials of Construction

Technical Specifications (data sheets) for the following waste handling equipment shall be prepared by the Bidder and included in their proposal:

- a) Discharge Retention Tank;
- b) Concentrate Conveyance System;
- c) Systems for Conveyance of the Other Waste Streams from their Point of Origin to the Discharge Retention Tank.
- d) Disposal of Solid Waste as per the Guidelines of CEA

10.6.1 Discharge Retention Tank

With their proposal, the Bidder shall provide the sufficient information on the design of discharge retention tank.

All wet parts of stainless steel equipment processing waste discharge streams shall be of PREn of at least 40. The Bidder shall also provide plan and cross-section of the discharge retention tank and the pump station.

10.7 Process and Equipment Control Strategy

The operation of the equipment associated with the plant waste stream handling and disposal facilities shall be completely automated. All tank levels and equipment operating status indicators shall be continuously monitored and displayed on the system graphic control stations.

The desalination Works discharge water quality in terms of turbidity and conductivity/salinity shall be measured continuously and instrumentation for monitoring and recording of these parameters shall be installed at the desalination Works outfall near the boundary of the SWRO Desalination Plant.

In event of excessive increase in the discharge seawater turbidity and/or decrease or increase of discharge salinity and/or turbidity at or above the levels listed in Table 2-5 this instrumentation shall trigger alarms that shall notify desalination Works staff.

Additional instrumentation and monitoring provisions, which are required to be provided by the Bidder at the discharge outfall include installation of flow meters on the concentrate discharge line and the discharge pipe of the retention tank pump station. The flow meters shall record these flows continuously.

CHAPTER 11. GENERAL SERVICE FACILITIES REQUIREMENTS

11.1 Buildings

The Contractor shall construct the following ancillary buildings in accordance with the Employer’s Requirements including all facilities complete with water, electricity, sanitation, drainage, permanent fixtures, relevant furniture, air conditioned facilities etc. to make them habitable. All building components (foundations, roof, columns, exterior building walls, etc.) shall be designed to meet local building codes and local authority requirements. All the floor area of the buildings shall be tiled as required.

A separate access shall provide to the circuit bungalow and quarters.

The bidder shall submit his concept with sketches showing preliminary design in his technical proposal.

11.1.1 RO System Building and Chemical Storage Facilities

All chemical storage facilities shall be designed in compliance with all pertinent environmental and worker safety regulations and local building codes and local authority requirements. Appropriate fill connections, loading and unloading provision shall be provided.

All chemical tanks and chemical storage areas shall include containment provisions in accordance with applicable codes and regulations but not smaller than 110% of the total chemical storage tank volume. Where concrete bunds are provided these shall be leak tight (no cracks or minor cracks 100% repaired to leak tight) and all bunds shall be epoxy coated to achieve more than 5 years’ service life of the coatings. Surface must not be penetrated by fasteners.

Incompatible chemicals (acids or caustics) shall not be bundled together and minimum separation distances shall be provided between dissimilar chemical tanks and bunds.

Chemical dosing pumps shall not be located inside the chemical tank bunds but provided with separate containment.

The following rooms will be built within the desalination facility: workshop, store, electrical room, control room, computer room, laboratory, membrane cleaning room and the chemical feed room.

11.1.2 Administration Building

All administrative, control, laboratory and maintenance functions associated with the operation of the SWRO Desalination plant shall be located within the Administration Building.

This building will house the plant management offices, labourer locker and shower rooms; laboratory; plant control room; maintenance shop; equipment storage shop and other rooms that may be needed for the normal functioning of the SWRO Desalination Plant.

The Administration building of the SWRO Desalination Plant shall include rooms and service areas listed in Table 11-1. The minimum footprint of these rooms and areas shall be as indicated in Table 11-1.

The Plant Laboratory shall be adequately furnished and equipped with the required instruments / apparatus and glassware for carrying-out the required tests during operation of the plant. A temperature controlled room must be provided to hold all of the computer equipment used in the Plant Laboratory.

Table 11-1: Key Rooms and Service Areas in the Administration Building – Minimum Footprint Requirements

Offices	80 m ²
Control Room	35 m ²
Break Room	40 m ²
Reception Lobby	25 m ²
Records	40 m ²
Conference Room	60 m ²
Restrooms	40 m ²
Workshop & Storage Area	200 m ²
Electrical Room	30 m ²
Laboratory	60 m ²
Auditorium with stage / podium facilities, sound system and multimedia facilities to accommodate 40 participants	250 m ²

11.1.3 Circuit Bungalow with 4 Rooms

A furnished circuit bungalow with minimum floor area of 175 m² with 4 bedrooms, living room and pantry cum dining, kitchen etc. All bed rooms shall be of 14 m² minimum floor area and have attached bath-room/toilet facilities. Circuit bungalow floor shall be tiled and all bed rooms / living room / dining room etc. shall be provided with ceiling fans to provide proper ventilation.

11.1.4 Quarters for NWSDB Staff Working at the Treatment Plant

The following specific requirements must be fulfilled in respect of the 3 categories of quarters mentioned herein;

1. Three numbers of Quarters for Skilled / Semi-skilled Grade Staff: Floor area of each quarters shall not be less than 70 m². Two Bedrooms, living and dining rooms with pantry/kitchen and bathroom/toilet shall be provided. All rooms shall be provided with ceiling fans to provide proper ventilation.
2. Two numbers of Quarters for Supervisory Grade Staff: Floor area of each quarters shall not be less than 80 m². Two Bedrooms, living and dining rooms with pantry/kitchen and bathroom/toilet shall be provided. Floor shall be tiled. All rooms shall be provided with ceiling fans to provide proper ventilation.
3. Two Quarters for Engineer Executive Grade: Floor area of the quarter shall not be less than 125 m². 3 Bedrooms, living and dining rooms with pantry/kitchen and attached bathroom/toilet for all bed rooms shall be provided. Floor shall be tiled. All rooms shall be provided with ceiling fans to provide proper ventilation.

11.2 Paving and Parking

All plant roads and parking areas shall be paved. The road geometry shall allow ready access for the large (up to 20-ton) trucks expected to make bulk deliveries to the plant.

Parking provided shall include at least 30 parking spaces. The parking layout shall be shown on the proposed site plan.

11.3 Landscaping and Irrigation

Landscaping and associated irrigation system shall be provided around the RO and Administration Buildings.

Source of irrigation water shall be a combination of any storm water (rainwater) harvested from the building roofs and the site and or potable water produced by the SWRO Desalination Plant.

Landscaping of a total minimum surface area of up to 15% of the site shall be provided by the Contractor.

Landscaping shall meet Employer requirements and incorporate feedback from local state and regional bodies. Plants and landscaping features shall be hardy and drought tolerant. Contractor shall also provide all required shelving and fit-out of the workshop and provide a full set of special tools for maintenance, special tools for handling or loading of chemicals.

11.4 Vehicles for Employer’s Representative during Operation Service

The Contractor shall facilitate to purchase and handover to the following vehicles as directed by the Employer’s Representative. The allocation for vehicles included under the Provisional Sums (Schedule 4.3).

- a) Car – 2 nos.
- b) 4WD Double Cab Pick-ups – 1 no.
- c) Crew Cab - 1 no.

11.5 Site Access

The Contractor shall establish a permanent access road to the site from the B402. In addition, the Contractor is likely to use the A9 (Class A road) and B402 (Class B road) to bring in equipment and materials to the site. The Contractor is responsible for ensure the integrity of the B402 and the waterway crossings (culverts) along the route before using the road and to repair any damages to this road caused by the Contractor’s and subcontractor’s’ vehicles. (Refer to Figure 1.3).

The contractor shall establish new access roads (shown in Attachment A.2.1.b) to the SWRO Plant site in accordance with Section 3.7.10 Roadways.

CHAPTER 12. ANCILLARY AND SUPPORT SERVICES

12.1 Works Description

The following systems, which are not addressed in other chapters, are included in the ancillary and support facilities:

- a) Service Air;
- b) Instrument Air;
- c) Fire Detection, Fire Alarm, Fire Protection and Fire Fighting system;
- d) Chemical Treatment Systems (re-mineralization and disinfection systems are included in other Chapters);
- e) Potable Water;
- f) Service Water;
- g) General Site Services, Utilities, Safety Showers
- h) Membrane Flush.

A description of equipment specification data sheets and materials of construction of above mentioned systems shall provide in the Technical Proposal.

12.2 Service Air

A service air compressor and receiver shall be installed in the RO building. A service air ring main shall be installed to service the membrane building and shop areas.

Duty /standby compressors shall be provided along with a suitably sized air receiver to cater for SWRO Desalination plant needs.

Service air system pressure, temperature and flow should be monitored and information provided to the Operator through the Plant Control System.

All equipment shall meet local, state and national codes and standards.

12.3 Instrument Air

An instrument air compressor system, receivers, and drier shall be installed in the RO building. An airline separate from the service air system shall be provided to ensure a clean, dry air supplies to instruments and valves. A cross connect (normally closed) shall be included between the service and instrument air systems for additional backup capacity.

Duty /standby compressors shall be provided along with a suitably sized air receiver to cater for safe and reliable operation of the SWRO Desalination plant.

Instrument air system pressure (dual redundant), temperature, quality and flow (dual redundant) should be monitored and information provided to the Operator through the Plant Control System.

All equipment shall meet local, state and national codes and standards.

12.4 Fire Detection and Protection

Water treatment plant equipment and the concrete floors and metal building frame and walls are not expected to constitute a fire hazard. However, fire protection sprinkler system shall be provided in accordance with the requirements of all applicable building codes.

To protect personnel, a fire detection system shall be installed in critical areas. The administrative offices, control room, laboratory, etc. shall be equipped with a sprinkler system. The fire detection and protection system shall be designed and build in compliance with the local building codes.

Early smoke detection and alarm system shall also be provided for the electrical, control and other areas, as appropriate.

The room used to house the computer equipment must have the following:

- a) Heat sensor, smoke detector and infrared sensor connected to the alarm system
- b) Automated CO₂ fire suppression system
- c) Fireproof walls, floor, ceiling and doors

Fire Detection and Protection system information should be provided to the Operator through the Plant Control system as well as visible and audible alarms.

Fire hydrant ring main, hydrant points and system shall be provided to meet the needs of local Fire authorities

12.5 Chemical Treatment Systems

Chemical treatment/feed equipment shall be located in the following areas:

- a) Intake (feed chlorination);
- b) Chemical Storage Area (source water and potable water conditioning);
- c) Pre-treatment and RO building (coagulant, acid, bisulphite, anti-scalant, membrane cleaning chemicals);

Space shall be allotted in each area for dosing equipment, chemical storage, etc. Layouts of each area shall be provided with the proposal.

Safety showers must be provided at all chemical areas.

Bulk storage tanks for acid, coagulant and flocculants shall be provided adjacent to the Pre-treatment or RO system building. All chemical tanks and chemical storage areas shall include containment provisions in accordance with applicable codes and regulations. Preference is given to discrete coated concrete bunds for all chemical containment.

All Chemical Storage and Treatment systems shall be adequately designed to provide a high quality and reliable operation. Safety of personnel, asset and environment shall be key considerations in the design, layouts, access and other considerations.

Chemical system information (levels, flow, and pH) should be monitored and information provided to the Operator through the Plant Control System.

Hazard and operability studies shall be conducted and all improvements or enhancements identified in the Hazop studies shall be implemented by the Bidder at its cost.

12.6 Potable Water for Use at the Plant

Potable water (for use within the plant) shall be provided by the Contractor to the rest rooms, locker room, and break room of the SWRO Desalination Plant.

Pressure and flow should be monitored and reported through the Plant Control system.

This potable water shall be supplied from the plant potable water storage tank and metered.

12.7 Service Water

Because the anticipated use of service water is small, potable water shall also be used for general area cleaning, washing, cooking and personnel use. Contractor shall provide a metered connection to RO potable water for emergency backup.

Pressure and flow should be monitored and reported through the Plant Control system.

The design shall include back-flow prevention devices to ensure that service water usage does not result in contamination of the potable water system

12.8 General Site Services

The Bidder shall include general site services including small power, pump drains and other water and utility services in its proposal.

All site drainage is to be captured and drain to a single site discharge point.

Bidder shall also include a small fuel tank, mobile refuelling tanker and filling arrangement so that construction vehicles do not have to leave site frequently for refuelling.

12.9 Membrane Flush

To ensure the RO membranes are flushed after each shutdown, a low TDS membrane flush system shall be installed. Equipment shall include flush pumps, a flush tank, and hard piping to each train. During each normal shutdown, the control system shall include a flush sequence for the affected train. The flush tank should be sized to complete flushing of all RO trains.

CHAPTER 13. INSTRUMENTATION AND CONTROLS

13.1 Overall Instrumentation and Controls Strategy

The control architecture for the SWRO Desalination Plant shall be provided with a Plant Control System, incorporating programmable logic controllers (PLCs), Supervisory Control and Data Acquisition System (SCADA), a Plant Control Station, Operator and engineering workstations, backup servers, domain controllers, historian and various touch screen displays for field control & annunciation. Remote input/output (I/O) racks shall be distributed throughout the site to minimize the amount of wiring back to the main control room. The SWRO Desalination Plant shall be visible from SCADA control and mentioning’s room.

The Plant Control System shall be easily expandable to accommodate the doubling of the plant to 48 MLD capacity.

The main control room of the 24 MLD plant will be located in the Administration Building. The PLCs for the plant shall be powered by a dual-redundant UPS system located in the Administration building. The UPS system shall be sized properly and shall meet the Employers requirements.

The SWRO Desalination Plant shall use a tree-type communications system in order to integrate equipment, instruments and computers. The equipment level systems (i.e. control net) shall communicate with such devices as motor control centres, variable frequency drives and other PLC’s. The instrument level system (foundation field bus) shall communicate to most of the process instruments, air operated valves and/or motor operated valves. The computers shall communicate peer to peer via standard TCP/IP or equivalent Ethernet. An UPS shall be included to maintain instrument power during a power outage and allow a controlled and safe shutdown as required.

All panels in process areas shall be appropriately rated (including IP rated) and shall be of duplex steel construction. The system shall be completely automated. However, it will not be unmanned. Detailed narrative control strategies shall be developed by the Bidder on a loop-by-loop basis for each major system and sub-component and shall be provided with the proposal. The narratives shall describe all parameters monitored, displayed, and alarmed as well as detailed control sequences for equipment start, stop, reset and shutdown.

The SWRO Desalination Plant shall be equipped and monitored to allow operating personnel a complete understanding of all process functions and equipment device status from the Operator workstations. All devices shall have field-manual, remote-manual, and remote-automatic operation capability. All rotating devices shall be equipped with fail-safe shutdown interlocks based on critical parameters (e.g. low suction pressure) to protect the equipment.

Access to all system shall be controlled using a hierarchical approach will require password logins, and will be physically isolated from the internet.

All the SCADA and PLCs shall have local agent and all programmes, soft wares, passwords shall handover to the Employer after Operation Service Period. The system must be isolated from the internet, that is, there can be no physical or Wi-Fi connection.

The control strategy must be fully documented with comments and updated as changes are made throughout the Operation Service Period. Alarms may be transmitted using SMS.

13.2 Instrumentation and Control System Requirements

All pressure, level, temperature and flow transmitters shall communicate on the field bus network.

Analytical instruments, such as pH and ORP, shall communicate via the same network. Analog field devices that are not compatible with the installed field bus shall interface using the PLC via 4-20mA input cards (or I/O modules). All digital devices such as pressure switches, vibration switches, flow switches, temperature switches and level switches shall interface with the PLC via digital input modules. Thermocouple or RTD signals shall interface the PLC via specialty analog input modules.

All PLC programs shall be configured to allow modification to set points, pump sequencing, timers, etc. readily by plant personnel from the Operator workstations. Ladder logic in the PLC program shall be configured to allow modification using the programming devices and software installed in the system. Check ladder diagrams be to IEC 61311 standard. International Electro – technical Communication, Standards and Recommendations (IEC) for all PLC, SCADA design and implementation.

All analog and discrete inputs to the PLC shall be displayed at the workstation along with status of hardware, software, communication links and monitoring information required. Real-time and historical trending for all analog inputs to the PLC shall be performed. All analog inputs shall be scaled into specified engineering units at the PLC. Provide high and low alarm trip points at 90% and 10% of span for all analog points unless otherwise required by the detailed control descriptions. All flow inputs shall be totaled at the PLC and displayed at the workstation. All pump run status inputs (including duty / standby, hours run and hours elapsed) shall be used to establish RUN time meters at the PLC and displayed at the Operator workstation.

All alarms shall display on a common alarm screen. No alarm shall be designed to clear automatically until is acknowledged by the plant operations staff.

Bidder shall provide a brief write-up on its proposed alarm philosophy, alarm prioritisation process.

Displays shall be arranged using a hierarchy level, where the first level of a process area shall show only information that needs to be immediately available for operations and shall be a system overview. The second level shall be poke points for more details on a particular process or piece of equipment. The third level shall also be poke points for control stations for devices such as pumps and valves, etc.

The Plant Control System (and or SCADA) HMI graphics colour code shall meet project standards. Contractor shall also provide display panels for all equipment controlled by the PLC, the equipment shall receive and display applicable status and alarm signals, such as operating mode (LOCAL, REMOTE, etc.), operating status (ON, OPEN, CLOSED, etc.) and alarm status (FAIL, LOCKED-OUT, etc.). For multistate devices where an actual digital input is not provided, provide PLC logic based on the status of the other inputs to develop the remaining status. For example, for LOR switches use the status of the LOCAL and REMOTE inputs to develop and display the status of the OFF position.

For all equipment controlled by the PLC, provide separate displays and poke points for selection of AUTO/MANUAL operating modes. In AUTO mode, the device shall be controlled by the PLC. In MANUAL mode, the device shall be operated by START/STOP, OPEN/CLOSE poke points, as appropriate. The workstation shall display the current

operating status of each device and an alarm if the equipment fails to respond to a command signal after an adjustable time period.

Device colour change to indicate operation or position change.

All proportional plus integral plus derivative (PID) control functions shall be performed at the PLC with controller faceplate displays at the workstation. All standard PID control Bidder interface shall be provided, including AUTO/MANUAL mode selection. In AUTO, the controller output shall be based on the PID control function at the PLC. In MANUAL, the output of the controller shall be based on a Bidder set value. Transfer between MANUAL and AUTO shall be bump less. At the workstation, provide AUTO/MANUAL selection poke points for PID controlled equipment, with graphic loading displays for manual control.

All alarm functions shall be carried out at the PLC level. Equipment safety interlocks specified to shutdown equipment “independent of control mode” or other like description shall be active regardless of PLC (MANUAL/AUTO) or field control station (ON, LOCAL/REMOTE) operating status. Other software generated alarms shall remain active independent of operating mode, but only effect specified control actions in AUTO (PLC) and REMOTE (field) operating modes.

13.3 Process and Instrumentation Diagrams

Process and instrumentation diagrams (P&ID’s) illustrating all key facilities shall be provided by the Contractor within 1 month of commencement of Contract. Drawings shall show all functions and parameters monitored, controlled or alarmed using ISA standard symbols and function blocks.

CHAPTER 14.

ELECTRICAL SUPPLY SYSTEM

14.1 System Description

The Electrical Supply System shall be sized for 48 MLD Plant Capacity for transmission lines and up to the inlet to the step-down transformer and shall comprise:

- m) Power supply infrastructure, Electrical Substation, step-down transformers, electrical isolation (breakers), cabling, bus ducts or any required connection to the Power Grid of Ceylon Electricity Board (CEB);
- n) Two 100%-load 33 kV electrical conduits shall be provided for the SWRO desalination plant (one conduit for CEB supply and other one for Standby Generator) electrical system with the 1.1 kV electrical switchgear of the SWRO Desalination plant and facilities for interconnecting to the SWRO Desalination Plant electrical system
- o) Electrical switchgear, motor control centre, electrical isolation (circuit breakers), cabling, cable management system, cable trenches, cable draw-pits, conduits;
- p) Construction required by the Contractor including Substation and Connection to the Power Grid of Ceylon Electricity Board;
- q) Variable Frequency Drives and Motor Control Centres (MCCs);
- r) Electrical Generators, power management system including plant shut-down system;
- s) Cable management system, cable pits, cable trenches, cable supports, cable terminations and cable segregation;
- t) Fire and smoke detection and protection system for the electrical switch rooms, transformer areas and associated works;
- u) Space provision to install additional step-down transformers to support expansion to 48 MLD Plant Capacity (in the future);
- v) A diesel generator of sufficient size to power the controlled shutdown of the plant in the event of a complete power outage is to be provided (contractor to price in bid);
- w) A diesel generator of sufficient power to operate one of the 6 MLD trains and upstream and downstream supply systems is to be designed and costed (a provisional sum has been made for this)
- x) Arrangement to measure the power consumption of RO system, high lift Potable Water Pumps and Area Lighting and Administration Building separately;

The Ceylon Electricity Board (CEB) is the nominated service provider and Contractor is expected to liaise with CEB and include all required is expected works to provide a functional and high reliability electrical supply. The CEB's tariff rates may be found from the CEB's web site.

The CEB will bring the electricity to the treatment plant site and provide a step-down transformer, and a provisional sum has been made for this. The Contractor will take the electricity from the step-down transformer for the supply to the plant and pump stations.

The Contractor shall be responsible for the design, procurement, construction and installation of all facilities and conduits downstream of the step-down transformer and is to the cost of these works into its bid price.

Contractor shall design the electrical system to meet the minimum requirements of British Standards. If any aspects require Employer confirmation, the Contractor shall seek clarification or confirmation from the Employer and if no clarification is provided, the Contractor shall assume that the most onerous design condition (from British Standards) would apply in all situations.

The plant will be supplied with high-voltage power from Ceylon Electricity Board national grid circuits, which will be capable of delivering 100% of the plant load. The power circuit within the site will deliver 33 kV power to the SWRO Desalination Plant boundary. The Bidder shall construct all plant facilities needed to supply electricity for the plant and shall complete the connections to the high-voltage power supply system of Ceylon Electricity Board.

Operators are to be protected from all HV infrastructure and access to such is to be limited. National Standards will be strictly applied.

14.2 Site Electrical Supply System

The Bidder is responsible for the design and construction of the electrical supply system for all Works equipment and facilities. All instrumentation, computer systems and the fire alarm system shall be powered by an uninterruptible power supply (UPS) system which shall provide power for at least 20 minutes while the main power source is down.

The supply voltage by Ceylon Electricity Board (CEB) is 415V (I-I) and 230 (I-N) with 50 Hz, The high voltage motors and low voltage motors shall be totally enclosed fan cooled with super-efficient ratings unless otherwise specified. All medium voltage motors shall be provided with weather protective housings and super-efficient ratings.

Lightning protection/prevention shall be provided for the filtration area, the RO system building and chlorination building using two lightning preventer instruments mounted on the top of air terminals positioned to cover the entire site taking into account anticipated site specific weather conditions. Grounding to the site shall be provided via grounding grid composed of embedded concrete rebar in the RO system building connected to grounding rods. The location and size of the motor control centres (MCCs) shall be established by the Respondent. A Voltage Stabiliser also shall be provided.

14.3 Standby Electrical Supply System

The Bidder shall design and provide the independent standby power supply system for unexpected power failures. The standby power supply system shall cater the power required for followings;

1. For the safe shut down of the plant and protect the components of the treatment system
2. For the administrative works

The cost for the above system shall include into the Bidder’s proposal.

Also, the Bidder shall provide the design calculations and requirements for a standby power supply system to operate at least one train (6 MLD), CIP unit, PLC and SCADA. This system shall consist of a Diesel Engine Generator with a sound proofing system, complete exhaust system and Mains Failure Relays and all control equipment plant and the provision to connect the Generator to SWRO Main electrical panel with proper electrical control. The allocation for this second system is included under the provisional sum.

14.4 Electricity Tariffs

The electricity tariffs are available from the Ceylon Electricity Board web site. The Employer is accepting the tariff risk; that is changes to the tariffs will be absorbed by the Employer (within the power consumption guarantee).

CHAPTER 15.

SCHEDULE OF GUARANTEES AND PERFORMANCE

15.1 General

The Bidder agrees to build the 24 MLD SWRO Desalination Plant complying with the Potable water quality specified in Table 2-4 of this Employer's Requirements.

If equipment / system fail to meet the guaranteed values, at Acceptance testing or anytime during the 7-year Operation Service Period, all necessary modifications and / or replacements shall be carried out by the Contractor at its own cost and without any extra cost to the Employer so that equipment / system comply with the guaranteed requirements.

15.2 Guarantee Tests

The responsibility of conducting the test will be with the contractor and the contractor shall make all the arrangements for carrying out tests at site and all costs associated with the above tests shall be borne by the contractor. The guarantee parameters must be demonstrated by the contractor upon completion of integration, preliminary/initial operation, trial run and commissioning of the plant and equipment.

Guarantee test at site shall be conducted within thirty days after successful completion of trial operation, commissioning, stabilization of the complete plant establishing the desired capacities and parameters in the presence of Employer's representative. If the guarantee tests cannot be conducted within 30 days, the Contractor shall propose options for the Employer to approve. Undertaking the guarantee tests after 30 days will not relieve the Contractor of its obligation to undertake guarantee tests and demonstrate plant performance.

All instruments used during tests shall be of adequate accuracy for the purpose in accordance with international standards and calibrated beforehand. All the instruments required for the functional guarantee test should have been calibrated by the contractor from the client approved independent agency/ reputed laboratory /Institute prior to the start of the test, by standard methods and valid calibration certificates shall be submitted by the contractor before executing the test.

Both parties jointly shall witness all phases of the test and record the data. The test shall be conducted in presence of the respective skid/membrane and equipment supplier/manufacturer to monitor and demonstrate the performance of the units and respective equipment and shall make minor adjustments to the equipment/skid if required, prior to the official test.

At the end of test, the contractor shall prepare a test report and submit to the Employer. Submission of the report and subsequent approval by Employer shall be required for completion. Test reports shall be submitted in booklet form showing all fields tests performed to adjust each component and all field tests performed to prove compliance with specified guarantee parameters.

During testing the readings are to be taken every two (2) hours from the field instruments as well as from the control room panel during the test period in the field log book as well as in the log book maintained in the control room for all necessary parameter

The total duration of the guarantee test must be 30 days comprising 3 x 10 days continuous days for each test.

The Bidder shall propose a test procedure along with the bid submission which will be agreed at Contract stage.

Contractor to include a guarantee test to be carried out (in the alternate) for each of the 6 MLD train in case sufficient demand of potable water cannot be achieved for the test duration.

If guarantee test is required to be conducted in part load, then Bidder shall propose combination of 6 MLD trains to test so that each train has reasonable hours of test during the 3 x 10 days Acceptance Test.

The following table of guarantees will apply for Acceptance Testing as well as during the Operation Service Contract duration:

Table 15.1: Schedule of Guarantees

No.	Functional Guarantee [as required in the Specification, e.g., performance, efficiency, consumption, etc.]	Minimum and/or Maximum Requirements [as required in the Specification]
1	Water Production Quantity	24 MLD Potable Water
2	Water Production Quality	As specified in Table 2 -4 in Section 6:ERQ
3	Energy – SWRO Plant	3.8 kWh/m ³ [or lower amount as proposed by bidder]
4	Energy – Administration Building, Quarters, Circuit Bungalow and internal lighting	[As proposed by bidder]
5	Chemical usage	[As proposed by bidder]
6	Replacement of Ultra Filter (if used)	[As proposed by bidder]
7	Replacement of Cartridge filter	[As proposed by bidder]
8	Replacement of RO membranes	[As proposed by bidder]

The Item 3 “Energy – SWRO Plant - 3.8 kWh/m³ [or lower amount as proposed by bidder]” in the Table 15.1 refers to the average daily power consumption to produce 24 MLD of potable water from sea water. It does not include the power for other site activities including the administration or residential areas, site lighting or the potable water pumping station.

15.3 Water Production Quantity and Quality Guarantee

The Contractor shall design and build the MLD SWRO Desalination Plant to achieve Potable Water Quality specified in Table 2-4 of this Employer’s Requirements.

The Contractor shall design and build the SWRO Desalination Plant and associated Delivery Tank and Pipeline to deliver Potable Water of 24 MLD minimum capacity to the designated delivery points.

The SWRO Desalination Plant shall be capable of operating as 4 x 6 MLD trains efficiently and effectively.

15.4 Power Use Guarantee

The Bidder agrees to build the SWRO Desalination Plant such that the plant will meet the following power guarantees:

The total RO plant daily average power consumption for potable water production for any day during the Testing period shall not exceed unit power consumption of 3.8 kWh/m³ or a lower value if a lower value is guaranteed by the Bidder for the respective daily average intake water salinity (TDS concentration) and temperature. This excludes the high-lift Potable Water pumps and the Administration Building HVAC and area lighting.

Contractor shall design and construct SWRO plant capable of producing potable water at guaranteed maximum energy level.

15.5 Chemical Use Performance Requirement

The Contractor shall design the plant to ensure Chemical use is kept to a minimum:

1. The total 30-day use of individual chemicals included in Bidder Proposal shall be demonstrated at the time of acceptance testing.
2. If there is an exceedance in chemical use, it shall be corrected by the Contractor at his costs (other than for situations where additional Chemicals are required for Seawater Quality excursions).

15.6 Cartridge Filter Replacement Frequency (Performance)

The Contractor shall size the cartridge filters properly and procure cartridge filters from reputable manufacturers. In addition, the Contractor shall demonstrate the following during acceptance testing and during 7-day Annual Capacity tests:

1. Total pressure loss through the cartridge filters does not exceed 0.7 bars.

15.7 Membrane Replacement Frequency (Performance)

All membranes are to be individually identified in the racks and in storage and the life of each membrane and the reason for its replacement tracked.

Further;

- a) Membranes are required to achieve a minimum life of 5 years.
- b) Operational issues may require some membranes to be replaced ahead of this time. The replacement of membranes under five years old is the responsibility of the Contractor.

CHAPTER 16. OPERATION MANAGEMENT REQUIREMENTS

16.1 General Operation Management Requirements

The Contractor shall be responsible for the Operation Service of the Works for seven (7) years from the date stated in the Commissioning Certificate. Operation Service shall be performed in a professional, efficient, and economical manner, in accordance with the terms and provisions set forth in this DBO Agreement, and in compliance with all Applicable Laws and Applicable Permits.

At all times, the Contractor shall keep the Works in good condition and working order, performing services twenty-four (24) hours per day, seven (7) days per week.

The scope of services under the Operation Service Agreement encompasses the Operation Service of all equipment, instrumentation, processes, facilities, systems, structures, utilities and plant that are acquired or created under this contact.

Overall operations and maintenance shall be based on the following key objectives:

- a) Meeting of Works process and drinking water production goals and performance warranties;
- b) Protection of the health and safety of the operating staff and any sub-contractors or service providers during the Operation Service Period;
- c) Protection of the environment in compliance with CEA guidelines
- d) Protection and preservation of the equipment and structures of the Works in good working order such that all equipment and assets achieve their design lives; and
- e) Maximization of operational efficiency.

The Bidder is responsible for all items that pertain to meet the Performance Standards of the Works including:

- a) Management and oversight of day-to-day Works operations;
- b) Works performance analysis and direction of Bidder staff to optimize Works operations and meet Performance Standards;
- c) Process control and testing;
- d) Management and oversight of sampling and monitoring associated with compliance with all Performance Standards, Applicable Permits, Potable water Quality Standards and Applicable Laws;
- e) Analysis of faults and performance issues, determining their root cause and taking actions to prevent reoccurrences.
- f) Safety and process training;
- g) Employee training and certification;
- h) Selection of type, quantity and quality of all chemicals needed for plant Operation Service and purchase of such chemicals;
- i) Purchase of materials, supplies and services associated with Works Operation Service
- j) Preventative maintenance, replacement and repair of all equipment, instrumentation, systems, pipelines, and structures of the Works;
- k) Maintaining of all equipment, process, membrane and other warranties and guarantees by provided by equipment suppliers;
- l) Management and oversight of Works waste handling and disposal;
- m) The Bidder shall provide all required spare parts at the substantially completion date of the construction of SWRO Plant and the quantity and type of these provided

spare parts shall be maintained throughout the Operation Service Contract (for seven years).

- n) Emergency response
- o) Preparation of reports and data for regulatory reporting and monitoring
- p) The Bidder shall formally meet with Employer on a predetermined basis to review performance of services, maintenance issues, and equipment conditions, environmental and permit compliance, and any other relevant issues. The Bidder shall also attend and participate at other related meetings as requested in advance.

16.2 Staffing

The Bidder shall be responsible for staffing the Operation Service for its duration. However, at the end of the Operation Service period the NWSDB may take back the operations and maintenance of the infrastructure acquired or created under this contract, and it is the Bidder's responsibility within reason and with the cooperation of the NWSDB to ensure that the NWSDB can carry out the operations and maintenance when this occurs.

To assist in this process the Bidder will accommodate staff from the NWSDB in the manner shown Table 16-1. The Bidder will be fully responsible for the daily work and safety the NWSDB staff and their competency development. The NWSDB will continue to meet the employment costs of its seconded staff. Where disciplinary action is required the Bidder is to refer this to the NWSDB which will not ignore such a request where it is impacting on the operation of the infrastructure or the safety of the site.

This matter is covered by the created and implementation of a Transition Plan as described in Clause 16.6.

**Table 16-1
Possible Requirements for Staffing over the 7-year Operation Period**

Position		Total Number of Plant Staff	Number of Jaffna Water Board Staff on the Operation Service Contractor Team						
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Representative for overall administration	NWSDB	1							
Representative for overall Coordination	Bidder	1							
Plant Manager	Bidder	TBA							
	NWSDB	1							
Senior Operator	Bidder	TBA							
	NWSDB	1							
Maintenance Manager	Bidder	TBA							
	NWSDB	1							
Shift Managers	Bidder	TBA							
	NWSDB	2							
Instrumentation Technician	Bidder	TBA							
	NWSDB	1							
Electrical Technician	Bidder	TBA							
	NWSDB	1							
Mechanical Technician	Bidder	TBA							
	NWSDB	2							
Store Keeper	Bidder	TBA							
	NWSDB	1							
Health & Safety Officer	Bidder	TBA							
	NWSDB	1							
Laboratory Technician	Bidder	TBA							
	NWSDB	1							
Secretary	Bidder	TBA							
	NWSDB	1							
Accountant/Purchasing	Bidder	TBA							
	NWSDB	1							
Driver	Bidder	TBA							
	NWSDB	1							
Helpers	Bidder	TBA							
	NWSDB	2							

Note:

1. TBA: To be assigned by Bidder
2. Bidder may propose an alternative (if required).
3. For the year 6 and year 7 the Contractor shall accommodate Employer’s resources per the above request.
4. The Contractor is to cover all costs of the employment of its staff as required by Sri Lankan laws and regulations. The costs of any staff provided by the Employer will be fully covered by the Employer.

Table 16-2.**Contractor’s Key Personnel for Operation Service (Suggested Requirement)**

The Contractor must provide the personnel (minimum) for the key positions that meet the following requirements:

No.	Position	Minimum Qualification	Total Work Experience [years]	Experience In Similar Work [years]
1	Representative for overall Coordination	Professional qualification with Bachelor degree or equivalent in Civil / Mechanical / Electrical Engineering	15	10
2	Plant Manager	Professional qualification with Bachelor degree or equivalent in Mechanical / Chemical Engineering	15	7
3	Deputy Plant Manager	Professional qualification with Bachelor degree or equivalent in Mechanical / Chemical Engineering	10	5
4	Maintenance Manager	Professional qualification with Bachelor degree or equivalent in Mechanical / Chemical Engineering	8	3
5	Operations Manager	Professional qualification with Bachelor degree or equivalent in Mechanical / Chemical Engineering	8	3
6	Shift Managers	Professional qualification with Bachelor degree or equivalent in Mechanical / Chemical Engineering	8	3
7	Instrumentation Technician	Diploma or equivalent in relevant engineering	8	3
8	Electrical Technician	Diploma or equivalent in Electrical engineering	8	3
9	Mechanical Technician	Diploma or equivalent in Mechanical engineering	8	3
10	Health & Safety Officer	Suitable qualification or equivalent experience	8	3

16.3 Overall Works Process and Equipment Control Strategy

Source seawater parameters that shall be measured and monitored during the 7-year term of the plant operation and shall include but not be limited to:

- a) Silt Density Index (SDI_{2.5});
- b) Turbidity;
- c) Total Organic Carbon (TOC);

- d) Total Suspended Solids (TSS);
- e) Algal Content Expressed as Algae Concentration of Chlorophyll a;
- f) Parameters Defined in Works Discharge Permit and process and potable water quality specifications
- g) Total Hydrocarbons

16.4 Pre-treatment System

The operation of the pre-treatment filtration system shall be based on the overall source seawater conditions and measurement of various physical parameters of the feed water and the filtered seawater including: total hydrocarbons, pH, turbidity, total suspended solids (TSS), total organic carbon (TOC), conductivity, flow, and silt density index (SDI). The pre-treatment system shall be operated in compliance with all maintenance recommendations of the original equipment manufacturer (OEM) and shall remain compliant with warranty conditions for the duration of the Term of plant operations. The Bidder shall operate the pre-treatment system such that energy and chemicals for its operation are minimized to reasonable levels, which allow maintaining equipment and membrane warranties.

16.5 Reverse Osmosis (RO) System

The reverse osmosis system shall be operated to produce consistent permeate water quality which meets all applicable Potable Water Quality requirements (Attachment 3), to minimize energy use; and to maintain the integrity and performance of the system components, equipment and RO membranes. The RO system shall be operated in compliance with all maintenance recommendations of the OEM contractor and shall remain compliant with warranty conditions for the duration of the Term. The Bidder shall operate the RO system such that energy and chemicals for its operation are minimized to reasonable levels, which allow maintaining equipment and membrane warranties and at the same time meet Works fresh water Daily Dispatch Requests.

16.6 Post-treatment System

The permeate produced by the reverse osmosis system shall be conditioned to achieve potable water stability adequate to prevent corrosion of the potable water pipeline and drinking water distribution system, to disinfect the potable water in accordance with the requirements defined in in Table 2 – 4 or Attachment 3 of this document.

16.7 Membrane Cleaning and Flushing Systems

A permanently piped clean-in-place (CIP) system will be provided for cleaning of the membranes in each RO train in-situ. The membrane flushing system includes a permanently piped membrane flushing system to automatically flush vessels of the RO trains on shutdown to remove residual concentrated feed water. The flushing will be accomplished using system potable water, prior to post-treatment chemical addition.

Additional information to be provided by the Bidder includes:

- a) Typical operational procedures of all key RO membrane cleaning/flushing system components.
- b) Performance parameters, which will be monitored and controlled to secure adequate RO membrane cleaning.

- c) Changes of RO membrane cleaning system operations during red tide events (i.e., change in frequency of membrane cleaning, length of cleaning cycle, type of membrane cleaning chemicals, etc.).
- d) Type, dosage, frequency and duration of application of cleaning chemicals. Specify the anticipated chemical dosages during typical source water conditions; rain events and red tide occurrences.

16.8 Potable water Pump Station and Transfer Pipeline

16.9 Waste Stream Management

The Works will generate several liquid and solid waste including:

- a) Commissioning water;
- b) Spent Filter Backwash Generated by the Pre-treatment System;
- c) Concentrate Generated by the RO System;
- d) Waste Membrane Cleaning Solutions Generated by the RO system;
- e) Waste Membrane Cleaning Solutions Generated by the pre-treatment system if membrane pre-treatment is used;
- f) Liquid or Solid Sludge (Sludge Cake) From the Solids Handling System;
- g) Spent pre-treatment and RO Membranes;
- h) Solids Waste (Garbage);
- i) Sanitary Wastewater;
- j) Flush water from RO Membrane Flushing During Temporary RO system Shutdowns;
- k) Not-to-Spec Water Produced by the Pre-treatment System, the RO System or the Permeate Conditioning System.

The Contractor shall be responsible for management and oversight of the collection, containment, treatment and disposal of all waste streams generated at the Works and listed above and for the operation of all waste stream equipment, facilities and plant outfall.

16.10 Reporting

Within thirty (30) days prior to the anticipated Commencement Date of plant operations, the Bidder shall develop and submit for Employer’s approval reporting procedures and forms for recording of Works performance during the Term of this contract. As a minimum, the Bidder shall provide the following reports:

- a) Incident Report
- b) Monthly Operating Report
- c) Quarterly Performance Report
- d) Annual Operating Report.

16.10.1 Monthly Operating Report Requirements

The Bidder shall prepare a Monthly Operating Report regarding the Works performance, operations and maintenance. This report shall be submitted to Employer no later than fifteen (15) Days after the end of the Month.

The Monthly Operating Report shall include data pertaining to performance compliance with Applicable Permit requirements, Performance Standards, Potable water and Source water flows, and any other information stipulated in this Operation Service Agreement. The Monthly Operating Report shall also include a description of maintenance activities and

emergency services performed during the previous month. The Monthly Operating Report shall include as a minimum the following:

- a) Monthly average Potable water quantity delivered to each of the points of delivery of potable water and potable water (MLD).
- b) Monthly Average Source water quantity (MLD).
- c) Compilations of the daily flow records with respect to quantities of source water treated and Potable water delivered to the distribution system.
- d) A summary of all test reports prepared during the month with respect to source water quality characteristics and parameters specified in this Schedule.
- e) A summary of all test reports prepared during the month with respect to Potable water quality characteristics and parameters as specified in Attachment 3.
- f) A projection of the Potable water capacity for both process water and for source seawater of the Works for the current month.
- g) A description of recommended Works or unit shutdowns for maintenance and repairs during the current month and anticipated during the following month.
- h) Description of unscheduled repairs.
- i) A list of significant preventive maintenance activities performed on major pieces of equipment and Works during this month and similar activities anticipated for the following month.
- j) Any anticipated adverse conditions that may affect the ability of the Works to receive and treat source water and deliver Potable water to the points of connection to the water distribution system.
- k) The results of any inspections conducted by governmental regulatory authorities during the current month, including recommended follow-up actions by the Bidder.
- l) The quantities (units) of electricity used during such month.
- m) Information on any utility (power, water or other) outages that have occurred during the current month that have an impact on the ability of the Bidder to perform its obligations under this agreement.
- n) A description of all incidents wherein the Potable water quality standards and / or quantity standards were not met, including the follow-up actions recommended by the Bidder to taken to eliminate or reduce the likelihood of re-occurrence.
- o) A description of any incidents (hazardous materials emergencies, security breaches, etc.) that adversely impacted Works operations and Bidder ability to fulfil its obligations under this agreement.
- p) Summary of Bidder worker claims filed, third party claims filed, and updates on the status of existing claims.
- q) Semi-annually, an update of the spare parts inventory.
- r) Any other data or information as mutually agreed by the Parties.

16.10.2 Annual Operation Report Requirements

Employer jointly with the Bidder may conduct a walk through the Works site to verify that Works operations and maintenance is being properly performed. Once per year this review will coincide with a more thorough annual review and preparation of an Annual Operation Report.

Approximately two weeks prior to the annual walk-through site review, and not later than thirty (30) days after the completed year’s operation, the Bidder shall submit to Employer three copies of the Bidder’s Annual Operation Report. This report shall include, at a minimum:

- a) Total Annual Potable water quantity (m³/year) and Annual Average Potable water flows of process water and potable water delivered to the each of the points of connection to the water supply system (MLD).
- b) Total Annual Source water quantity (m³ /year) and Annual Average Source water flows (MLD).
- c) All annual potable water quality characteristics for parameters specified in Attachment 3.
- d) A summary of the information provided in the Monthly Operation Reports.
- e) A summary of environmental and safety regulatory compliance.
- f) Updated Annual Operation and Maintenance Plan.
- g) An assessment of outstanding issues, including any recommendations for changes to Works operation or Works equipment.

The results from joint Employer / Bidder annual survey will be compiled for use as an annual addendum to the Bidder's Annual Operation Report. Approximately two weeks following the distribution of the addendum, the Employer and the Bidder will hold a one-day Annual Review Meeting during which the results of the joint Employer / Bidder survey and the Bidder's comments and responses will be discussed and all other matters of common interest and concern will be discussed and resolved. The Annual Operation Report will be finalized by the Bidder and issued within two weeks of the Annual Review Meeting.

16.11 Bidder Staff Training and Development

The Bidder shall be responsible for training and Development of the Works staff such that this staff shall can operate the Works in compliance with all requirements and provisions of this Agreement. The purpose of this training is to educate personnel about the proper procedures associated with the operations and maintenance of the desalination Works. All training shall be documented and the records maintained at the Works. Staff training shall be such that Jaffna Water Board staff can undertake the responsibilities of plant staff as specified in Table 16-1.

The Bidder shall provide with their proposal NWSDB Capacity Building Plan encompassing three (3) categories: Site Specific Training, Health & Safety Training, and Additional Technical/General Training.

16.11.1 Site-specific Training

All Operation Service personnel will undergo on-the-job training (OJT) exercises with various equipment manufacturers. This OJT program requires the signature of the employee and their trainer to verify that the employee has received and understands the operation, maintenance, and safety aspects of the equipment/material. This section of the plan will outline specific training on the proper Operation Service of new and/or modified equipment at the Works. This training includes, but not limited to, the following parts of the plant:

- a) Intake screens and other facilities.
- b) Pre-treatment System
- c) Chemical Feed System
- d) Membrane Clean-In-Place System
- e) RO System and equipment
- f) Instrumentation and control
- g) Electrical facilities on the RO plant.

16.11.2 Health and Safety Training

The Health and Safety of Works employees and the environment is essential for the proper Operation Service of the desalination Works. All Works personnel shall attend Health & Safety training sessions. This training includes but is not limited to:

- a) Acid and Base Handling
- b) Electrical Safety Training
- c) Sodium Bisulphite Handling
- d) Disaster Preparedness and Awareness
- e) Sodium Hypochlorite Handling
- f) Handling of CIP Chemicals for MF and RO Systems
- g) Lock-Out/Tag-Out Training
- h) Anti scalant Handling
- i) Emergency Response Planning

16.11.3 Additional General Training

In addition to Health and Safety training, each Works has site-specific topics where employees must be trained.

- a) Water Quality Assurance/Compliance
- b) Laboratory Safety
- c) Spill Containment/Slug Control Plan
- d) Security Training
- e) Evacuation Plan
- f) Accident Reporting Procedures
- g) Slips, Trips, and Falls
- h) Hearing Conservation
- i) Using Hand and Power Tools
- j) Hazard Communication
- k) Fire Prevention/Suppression

16.12 Operation Service Plan

16.12.1 General Requirements

The Bidder will manage and oversee the Operation Service of the Works in accordance with an operations and maintenance plan (Operation Service Plan) prepared by the Bidder and reviewed and approved by the Employer. The Operation Service Plan will describe principal aspects of routine and emergency operating procedures, repair and replacement, predictive and preventive maintenance, corrosion protection, staffing and training. The Operation Service Plan will contain as a minimum an overview description of the following:

- a) Plan for Day-to-Day Operations of the Works (Operations Plan);
- b) Works Management and Staffing Plan;
- c) Maintenance, Repair and Replacement Plan;
- d) Liquid and Solid Waste Stream Handling and Disposal Plan;
- e) Works Safety and Security Plan;
- f) Process Safety Management Program;
- g) Emergency Response Plan.
- h) Transition Plan.

The Bidder will provide to Employer: (1) a preliminary Operation Service Plan forty-five (45) days prior to the Commencement Date; (2) a draft final Operation Service Plan thirty (30) days prior to the anticipated Commencement Date, and (3) a final Operation Service Plan fifteen (15) Days prior to the Commencement Date. Employer may provide a copy of the final draft Operation Service Plan to the pertinent regulatory agencies or Employer agents for their review, as required by Applicable Permits. The Bidder will discuss in a good faith with Employer any aspect of the preliminary, draft final and final Operation Service Plan. The content of the Operation Service Plan will be consistent with the Bidder’s ability to perform its obligations in accordance with terms and provisions of this Operation Service Agreement. The Employer may also each year request reasonable updates to the Operation Service Plan.

The Bidder will update and submit to Employer any material changes to the Operation Service Plan at least sixty (60) days prior to the commencement of each Year for the duration of the Term of this Operation Service Period. Specific requirements related to the individual plans, which are integral parts of the Operation Service Plan are presented in the following sections.

16.12.2 Operations Plan

The Operations Plan shall describe principal procedures for normal, emergency and standby Works operations to meet the Bidder’s obligations under the Operation Service Agreement, including overall Works start-up and shutdown during unusual source water quality events (oil spills, severe algal blooms, lagoon siltation, jellyfish outbreaks, etc.) or other conditions which require such shutdown. The Operations Plan shall contain copies of all permits, licenses, certifications, and other regulatory documents associated with the Bidder’s service. This plan shall specify all tests to be conducted for the performance of this Operation Service Agreement, including all sampling and analyses procedures and related QA/QC reports.

16.12.3 Works Management and Staffing Plan

The Works Management and Staffing Plan shall include a thorough description of the Works staffing organization planned to be used by the Bidder with description of the roles and responsibilities of each staff position. This plan will include the following:

- a) Organizational Chart;
- b) Employee Resumes/Licensing Information;
- c) Employee Training Schedules.
- d) Identified critical roles and role coverage and succession

16.12.4 General Staffing Requirements

The Bidder shall be responsible for staffing of the Works and for payment of all labour costs associated with Works operations and maintenance for the duration of the Term of this Agreement. Unless otherwise approved by the Employer the staffing shall be in accord with the structure indicated in Table 16-1. If within two (2) years of Commencement Date the Bidder is not in compliance with the staffing structure specified in Table 16-1, the Bidder will be penalized as stipulated in this Agreement. The Bidder will organize Works operations work force in shifts and will maintain Bidder staffing levels in accordance with the Bidder Scope of Services. The Bidder shall ensure that its Works operations work force is familiar with and complies with all applicable safety requirements and conduct requirements of the Employer.

16.12.5 Licensing Requirements

The Bidder and all staff of the Bidder shall comply with the certification requirements for their respective classification level and scope of responsibilities as per the Applicable Law in Sri Lanka.

16.12.6 Obligations and Duties of the Bidder

The Bidder shall be responsible for performing their obligations stipulated in this DBO Contract in a responsible and professional manner consistent with standard operating practices and all Applicable Law. The Bidder shall undertake the works under this contract in an open, honest and collaborative way and promptly respond to reasonable requests for information which, where appropriate, will be provided in its raw form.

16.12.7 Maintenance and Replacement Plan

The Maintenance Plan shall describe how The Bidder will manage and direct Works staff to:

- a) Preserve the principal process equipment warranties;
- b) Perform predictive and preventive maintenance on all equipment and buildings in accordance with the recommendations of the manufacturer, Standard Industry Practices and this Operation Service Agreement.
- c) Perform corrective maintenance in such a manner that the equipment operation is not impacted and the performance standards are not threatened.
- d) Perform all maintenance, repair and replacement activities in accordance with Standard Industry Practices and this Operation Service Agreement.
- e) Prepare reports on maintenance, repairs, and replacements of any major equipment components
- f) The maintenance plan must contain a comprehensive proposed maintenance schedule including sections matched to plant and equipment warranty requirements. This schedule will be used for monitoring and reporting requirements.

The Maintenance Plan shall contain a section describing the plan approach to major maintenance, repair and replacement program. This program shall contain a detailed description of major maintenance, and replacement activities, which are recommended to be performed by the Works staff over the term of the agreement to maintain operability, durability, and reliability.

The Bidder shall describe the computerized maintenance system they propose to use for the predictive, preventive and corrective maintenance of the Works and indicate their experience with this system in other SWRO Desalination Plants with similar size and complexity, which they currently operate.

16.12.8 General Works Maintenance Requirements

The Bidder shall maintain Works in good working order and repair and in a neat and orderly condition. The Bidder shall maintain the aesthetic quality of the Works as originally constructed and subsequently modified, with due allowance for reasonable wear and tear.

The Bidder shall manage, direct and oversee Works staff to ascertain that they perform all predictive, preventive and corrective maintenance procedures in accordance with Applicable Laws, regulations and permits; OEM guidelines, conditions of the Applicable Permits, and Standard Industry Practices. Predictive, preventative, and corrective maintenance procedures must be performed as often and as comprehensively as recommended or

specified to comply with manufacturer’s warranties. The Bidder shall maintain all manufacturer warranties on purchased equipment and membranes.

16.12.8.1 Chemicals

The Bidder shall procure all chemicals needed for plant Operation Service and shall manage and oversee the delivery, handling and application of the water treatment chemicals used at the Works with all applicable regulatory requirements and Standard Industry Practices. Each chemical load shall be tested for product quality in accordance with the Works standard operating procedures included in the Operation Service manual and records of the test results shall be maintained and available for Employer review.

16.12.8.2 Equipment

The Bidder shall manage and oversee Works operations and maintenance such that all equipment is kept in a good operating condition and adequate equipment inventory is maintained to facilitate the repair and replacement of equipment. The Bidder shall direct and oversee the Operation Service of all equipment, and perform or cause Works Operation Service staff to perform all tests as may be required or recommended pursuant to applicable warranties.

16.12.8.3 Building and Grounds Services

Good housekeeping is an integral part of Works operations. The Bidder shall manage and oversee Works operations in such manner that all Works buildings, equipment and structures are kept clean and orderly. Equipment oil and grease should be wiped clean after any repair work is completed. Buildings will be kept clean and neat in accordance with Standard Industry Practices.

16.12.8.4 Potable Water Transmission Line Maintenance Requirements

Deleted.

16.12.8.5 Computerized Maintenance Management System (CMMS) Requirements

The Contractor will develop and implement a comprehensive computer-based maintenance management program that will collect historical data, including an inventory of spare parts, and a description of the repair work performed. As a part of the Transition Program the Bidder shall make available this system to the Employer and shall train Employer staff to use the system.

In their proposal the Bidder shall provide description of their CMMS and include a proposed program for training of Employer staff to secure smooth transition of plant operations from the Bidder to the Employer at end of the Term of this Agreement.

16.12.8.6 RO Membrane Cleaning Requirements

The RO membranes shall be periodically cleaned to restore performance in accordance with the manufacturer’s recommendations. The frequency of cleaning is dependent upon the

degree of fouling experienced by the membrane system. Cleaning criteria shall be based on the normalized flux decline of the membrane treatment system.

A normalization program shall be provided by the Bidder on the main control console in the control room. The normalization calculation algorithm shall be in accordance with the latest version of ASTM D4516-85 (Standard Practice for Standardizing Reverse Osmosis Performance Data) and must also be approved by the membrane manufacturer. Most data required for input to the normalization program shall be collected automatically through the programmable local controller (PLC). The Bidder shall collect all other additional data (if any) and input the values in the PLC software interface program daily.

The Contractor shall consult with the membrane manufacturer to obtain the membrane manufacturer’s membrane performance guidelines prior to initiating a cleaning. These guidelines shall include the following information for each array:

- a) Normalized permeate flow, percent decrease;
- b) Pressure drop over a stage or the system; percent increase;
- c) Normalized salt passage (or permeate TDS increase); percent increase.

The Contractor shall monitor the key performance parameters listed above daily to determine if the RO system requires cleaning. Additionally, the following conditions will be graphed daily as a troubleshooting tool and to ascertain the performance of the membrane system:

- a) Normalized Salt Passage vs. Time;
- b) Normalized Permeate Flow vs. Time;
- c) Salt Transport Coefficient vs. Time;
- d) Water Transport Coefficient vs. Time; and
- e) Normalized Differential Pressure (Delta P) vs. Time.

Cleaning solution make-up water shall be membrane system permeate unless an alternative source is approved in writing by the manufacturer. The Contractor shall obtain written acknowledgement from the manufacturer that the cleaning solution solvent (water) is acceptable quality, the cleaning chemical is approved for use at the indicated strength, and that the proposed membrane cleaning procedure is approved.

At a minimum, the membranes shall be cleaned in accordance with the manufacturer’s recommendations. The manufacturer’s advice must be sought on any proposed variation to the recommended cleaning regime (including on the use of chemicals and concentrations).

16.12.9 Liquid and Solids Waste Handling and Disposal Plan

The Contractor shall prepare a detailed Liquid and Solids Waste Handling and Disposal Plan describing the handling, storage and disposal methods and related permitting and transportation requirements of all liquid and solids waste generated at the Works. The plan shall indicate the location of the final disposal site/s and will contain a copy of the most recent permits related to the Works liquid and solids waste handling and disposal. The Contractor shall be responsible for the storage of liquid and solids waste generated by the Works. All relevant staff are to be fully made aware of the contents of this Plan.

16.12.10 Process Safety Management Program

A Process Safety Management Program (PSM), as per applicable regulatory requirements, shall be developed by the Bidder and included as an integral part of the Operation Service

Plan. This program shall be developed in accordance with all applicable requirements and is to include any feedback from operational staff.

16.12.11 Emergency Management Plan

The Contractor shall prepare an Emergency Management Plan (EMP). The objective of the EMP is to eliminate or minimize personal injuries or property damage that could potentially be the consequence of an emergency. The EMP must properly handle the situation until the emergency authorities (Response Team, Fire Department, Ambulance, Police Department, etc.) can arrive to take over an emergency action. After the arrival of such authorities, the EAP shall advise them and assist them as requested or directed.

As a minimum, the EMP contents shall address the following issues:

- a) Chemical spill reporting procedures and chemical storage, PPE inspection forms, and spill kit and personal protective equipment (PPE) locations;
- b) Personnel emergencies;
- c) Fire and explosions and fire extinguisher location maps;
- d) Pipe, valve, or pump failure;
- e) Equipment and process failure;
- f) Power failure;
- g) Acts of God (hurricanes, wind storms, floods, and earthquakes);
- h) Emergency telephone numbers;
- i) Emergency equipment vendors;
- j) Records preservations;
- k) Chemical storage inventory and monitoring system;
- l) Coordinating instructions with public safety agencies and other external emergency organization agreements;
- m) Troubleshooting guides;
- n) Evacuation Plan including evacuation meeting location and first aid trained personnel;
- o) Weather-related emergency procedures; and
- p) Material safety data sheets.

The EAP is to be tested annually by conducting a mock event, a debrief held and lessons learned used to update the EAP.

16.12.12 Incident Management Plan

The Contractor shall prepare an Incident Response Plan that addresses any incident that may arise during the operations and maintenance of the plant and site. Staff are required to be rostered to ensure a trained Incident Manager is available at all times.

16.13 Operation Service Manual

The Contractor shall be responsible for preparing and updating of Operation Service Manual which shall integrate key components of an Operations Service Plan into one single document for day-to-day use and reference by Works personnel. The Operation Service Manual shall be prepared in accordance with Standard Industry Practices.

16.13.1 Operation Service Content

The Operation Service Manual shall contain up to date as-built Works information in the following categories:

- a) System Overview - Introduction and a complete description, to include a schematic of the Works.
- b) Process Description - including all written Standard Operating Procedures (SOP's).
- c) Controls and Logic, including graphic "screen shots" of the computerized Works monitoring and control system.
- d) Operating Procedures.
- e) Safety Procedures
- f) Maintenance Requirements.
- g) Maintenance Manuals, including all manufacturers' manuals as may be updated or replaced from time to time.
- h) Troubleshooting Guidelines - all rotating equipment, membranes, analytical devices and displays, and valves.
- i) Complete calibration curves of all gauges and meters based on manufacturer recommendations.

16.13.2 Standard Operating Procedures (SOPs)

SOPs shall be incorporated in the Operation Service Manual in writing for all unit processes, including, but not limited to:

- a) Normal Works Start-up and Shutdown Sequence of Operation.
- b) Alarm / Emergency Works Shutdown Sequence of Operation.
- c) Source Seawater Micro strainers.
- d) Pre-treatment Filtration System.
- e) Membrane RO System, including High Pressure Pumps and Energy Recovery System.
- f) Water Stability and Monitoring - Normalization, Silt Density Index, Stiff and Davis Stability Index (S&DSI), and other monitored parameters in accordance with the Operation Service Agreement Documents.
- g) Potable water Transfer Pump Station.
- h) Concentrate/Discharge Pump Station and Blending with Power Works seawater.
- i) Membrane Cleaning.
- j) Chemical Handling, Storage and Delivery Systems, including chlorination, de-chlorination, coagulant, filter aid, acid, lime.

- k) Liquid and Solids Waste Handling.
- l) Power Distribution from the Electrical Substation
- m) Auxiliary Systems - Seal water, HVAC, etc.

Schematics shall also be incorporated into the Operation Service Manual. Schematics shall include the RO Works and the potable water transfer station and pipeline.

16.14 Potable Water Flow Metering, Monitoring and Sampling

The Contractor shall be responsible at the Bidder's sole cost for the regular calibration and testing of all flow meters associated with the works for which the Contractor has operations responsibility.

16.14.1 Flow Meter Accuracy and Calibration Frequency

The accuracy of all flow meters shall not be less than 0.3% and the flow meters shall be calibrated once every six (6) months but not less often than the frequencies specified by the respective flow meter manufacturers. The calibration shall be completed by a competent entity, which is approved by the membrane flow meter supplier to complete flow meter calibration.

16.14.2 General Monitoring and Sampling Requirements

The Contractor shall perform sampling, testing, and other analytical procedures set forth in this Schedule. Monitoring and testing shall include, but shall not be limited to:

- a) Source water quality and flow to the Works;
- b) Potable water Quality at the points of delivery of the potable water;
- c) Concentrate and other side streams generated at the Works, which are required to be monitored in accordance with the Works waste discharge permit and any other pertinent permits regulating disposal or liquid and solid waste from the Works;
- d) Monitoring in accordance with the Environmental Management Plan.

The applicable monitoring and testing will be completed at Contractor's expense and Contractor shall be responsible and liable for conducting the analyses recommended by the Employer. The analyses shall be conducted at an on-site laboratory or at certified outside service laboratory.

The Contractor shall implement and maintain a laboratory QC/QA program. The QC/QA program shall be conducted and documented per Standard Industry Practices.

The Contractor shall collect, compile, and review data generated by or received from all testing laboratories for all applicable regulatory permits and operating reports, and shall forward the results from the laboratory to Employer. Employer in turn shall be responsible for forwarding the necessary Works performance information to the appropriate regulatory agencies as specified in this DBO contract.

For each Month during the term of this Agreement, the Contractor shall measure, monitor, and report to Employer as a minimum the following parameters:

- a) Source water temperature measured at the point of feed to the process and potable water the Reverse Osmosis (RO) systems (degrees Celsius);
- b) Source water total dissolved solids concentration measured at the feed pumps to the Reverse Osmosis (RO) system (mg/L);
- c) Source water conductivity measured at the feed pumps to the Reverse Osmosis (RO) system (micro mhos/cm);
- d) Daily and Total Potable water flows for the current Month measured at the Delivery Points (million cubic meters/month);
- e) Total Works power consumption for the current Month measured using a power quantity measurement (PQM) device approved by Employer and installed at a location to be determined based on an agreement between the Bidder and the Employer (kWh/month). The power information indicated above shall be included in the Monthly Operations Report.

**Table 16-3.
Water Quality Monitoring Requirements – Raw Water**

This is a guide line only and shall be revised based on mutual agreement between Employer and the Contractor

Parameter	Hourly/Daily	Weekly	Monthly
Total Dissolved Solids, mg/L / Conductivity, mS/cm			
Temperature, °C			
Turbidity, NTU			
Total Suspended Solids (TSS), mg/L			
SDI ₅			
Oxidation Reduction Potential, mV			
Chlorophyll a, µg/L			
Total Organic Carbon (TOC), mg/L			
pH, Units			
Total Hydrocarbons, mg/L			
NO ₃ / Phosphates, mg/L			
Volatile Organic Compounds			
Total Coliforms, cfu/100 ml			
E. Coli, cfu/100 ml			

Table 16-4.
Water Quality Monitoring Requirements – Potable Water
 This is a guide line only and shall be revised based on mutual agreement between
 Employer and the Contractor

Parameter	Hourly/Daily	Weekly	Monthly
1. Physical Requirements			
Colour			
Odour			
Taste			
Turbidity (NTU)			
pH			
2. Chemical Requirements			
Chloride (as Cl) (mg/l)			
Free Residual Chlorine (as Cl) (mg/l)			
Alkalinity (Total as CaCO ₃) (mg/l)			
Free Ammonia (mg/l)			
Albuminoid Ammonia (mg/l)			
Nitrate (as NO ₃) (mg/l)			
Nitrite (as NO ₂ ⁻) (mg/l)			
Fluoride(as F ⁻) (mg/l)			
Total Phosphate (as PO ₄) (mg/l)			
Total Dissolved Solids (mg/l)			
Total Hardness (as CaCO ₃) (mg/l)			
Total Iron (as Fe) (mg/l)			
Sulphate (as SO ₄) (mg/l)			
Oil and Grease (mg/l)			
Calcium (as Ca) (mg/l)			
Magnesium (as Mg) (mg/l)			
Sodium (as Na) (mg/l)			
Manganese (as Mn) (mg/l)			
Boron (mg/l)			
3. Other Parameters			
E Coli and Cryptosporidium			
Lange liar Saturation Index (LSI)			
Total Recoverable Hydrocarbons			
Heavy metals(Cd, Cr, Pb, Hg, Cu, As etc)			

Table 16-5.**Water Quality Monitoring Requirements – Concentrate / Waste discharge Water**

This is a guide line only and shall be revised based on mutual agreement between Employer and the Contractor

Parameter	Daily	Monthly	Yearly
Total suspended solids			
Total dissolved solids			
pH at ambient temperature			
Biochemical oxygen demand (BOD ₅ in five days at 20°C)			
Temperature at the measurement point			
Oil and grease			
Chemical oxygen demand (COD)			
Dissolved Phosphates			
Ammonia nitrogen (as N)			
Total residual chlorine (as OCl ⁻)			
Fluorides (as F)			
Cadmium (as Cd)			
Chromium, total (as Cr)			
Copper (as Cu)			
Lead (as Pb)			
Mercury (as Hg)			
Nickel (as Ni)			
Faecal Coliform level			

16.14.3 Works Source Water Monitoring

Within thirty (30) Days prior to the anticipated normal operation Commencement Date, The Bidder shall develop and submit for Employer’s approval a Works Source Water Monitoring Protocol, which shall define the exact location, frequency and type of samples recommended to be collected by the Bidder for Works source water monitoring by Employer. In addition to the intake seawater monitoring requirements specified in the desalination Works waste discharge permit and other Applicable Permits, this protocol shall incorporate as a minimum the requirements listed below.

For each Month during the term of this Agreement the Bidder shall cause to be measured, monitor and report to Employer at a minimum the following intake source water quality parameters:

- a) Monthly Average Source water temperature measured at the source water intake pump station of the RO SWRO Desalination Plant (degrees Celsius);
- b) Monthly Average Source water TDS concentration measured at the source water intake pump station of the SWRO Desalination Plant (mg/L);
- c) Monthly Average Source water conductivity measured at the source water intake pump station of SWRO Desalination Plant (micromhos/cm);
- d) Monthly Average Source water total suspended solids (TSS) concentration measured at the source water intake pump station of the desalination plant (mg/L);
- e) Monthly Average Source water turbidity concentration measured at the source water intake pump station of the RO Works (NTU);
- f) Monthly Average Source water alkalinity measured at the source water intake pump station of the SWRO Desalination Plant (mg/L as CaCO₃);
- g) Monthly Average Source water pH measured at the source water intake pump station of the SWRO Desalination Plant (standard units);
- h) Monthly Average Source water flow measured at the potable water meter of the SWRO Desalination Plant. (cubic meters/month);
- i) Source water boron and bromide concentrations. Sampling location, sample type and frequency of sample collection shall be determined sixty (60) Days prior to the anticipated Commencement Date.
- j) Source water chloride concentration. Sampling location, sample type and frequency of sample collection shall be determined sixty (60) Days prior to the anticipated Commencement Date.

16.14.4 Potable Water Quality Monitoring

Within ninety (90) days prior to the anticipated normal operation Commencement Date, the Contractor shall develop and submit for Employer’s approval a Potable water Monitoring and Sampling Protocol, which shall define the exact location, frequency and type of samples recommended to be collected for Potable water Quality Standard monitoring by Employer. This protocol shall incorporate as a minimum the requirements listed below.

16.14.5 Minimum Monitoring, Sampling and Reporting Requirements

The minimum required frequency of measurement and type of samples of the Potable water parameters needed to determine compliance with the Potable Water Quality Standards shall be established based on mutual agreement between Employer and the Contractor based on the requirements defined in the Potable Water Quality Specifications (Attachment 3), and Performance Standards (Section 15 of this Employer’s Requirements).

All sampling and testing shall be completed according to all applicable regulatory requirements and approved testing methods. Testing procedures described by the American Public Health Association shall be used. All costs associated with sampling, monitoring shall be borne by the Contractor.

16.14.6 Permit Compliance Monitoring

The Bidder shall oversee the compliance with all Applicable Permits (Licenses) issued to the Employer and shall report on compliance with these permits.

16.15 Operation Service and Operator Requirements

16.15.1 Management commitments and leadership

The Contractor must:

- a) Establish policies that are appropriate to the successful performance of the Operation Service;
- b) Delegate to relevant members of the Operator's management team the responsibility to establish and implement the Operator's Management Plans;
- c) Nominate a suitably skilled and competent person to manage the Operator's Management Plans for effective and successful implementation and delivery of the Operation Service; and
- d) Establish a management review mechanism within the Operator's management team to regularly review and improve the effectiveness of the Operator's Management Plans.
- e) Create all necessary systems to set-up and operate the Works generally in accordance with ISO Quality, Environmental and Safety standards.

16.15.2 Water Supply production

The Contractor must ensure that the SWRO Desalination Plant provides Water Supply to the Delivery Point that meets:

- a) Employers requirement for the daily quantity of Water Supply between 6 MLD to 24 MLD (or more, as agreed) and up to the maximum design capacity of the plant;
- b) Where no such quantities have been specified, nominally 6 MLD.

16.15.3 Availability and Level of Service

The level of service reflects the required reliability of the SWRO Desalination Plant to deliver Water Supply to the Delivery Point. The Operation Service Contractor must ensure the SWRO Desalination Plant meets the following minimum availability and level of service requirements:

- a) The plant should be designed and operated such that the scheduled plant shutdown for the complete plant is minimized and all shutdown activities for individual (or groups of 6MLD trains) is completed within a maximum of 15 non-sequential days per year (up to 1.25 days per month of plant down time to accommodate planned maintenance activities).
- b) Reduced level of operation for planned maintenance by prior written agreement with the Employer without reducing the agreed production by greater than 25%
- c) 14 days calendar days' notice of any planned maintenance that will reduce the capacity of the plant.

- d) Unplanned Shutdown period for operational reasons not exceeding 5 days cumulative in any rolling 12 months;

16.15.4 Specific Energy Consumption

- a) The Contractor must perform the Operate Service to ensure the Specific Energy Consumption is less than 3.8 kWh/m³ of Water Supply at all times during the Term.
- b) The Contractor must demonstrate ongoing compliance with this requirement throughout the Term, at regular intervals in accordance with the Operation Service Management Plan.

16.15.5 Intake System

At all times in the performance of the Operate Service, the Contractor must ensure that it complies with the following minimum requirements:

- a) Intake screens are kept clear of debris and cleaned to a level that does not impair the supply of Seawater to the Desalination Plant;
- b) The velocity of seawater initially drawn into the Desalination Plant, measured at the face of the intake grilles (located at the intake structure) does not exceed 0.15 m/s; and
- c) The entrapment of marine biota does not affect the operation of the intake or plant.

16.15.6 Process Plant

At all times in the performance of the Operate Service, the Contractor must ensure that it complies with the minimum requirements set out in Chapter 16 - Employer’s Requirements of the DBO Contract.

16.15.7 Outfall System

The Contractor must ensure that at all times in the performance of the Operate Service it complies with the following minimum requirements.

- a) Where diffuser(s) form part of the Outfall System, they must provide a dilution factor for the full range of operating and tidal conditions
- b) Quality of outfall discharge must comply with Environmental Approvals;
- c) The Contractor must undertake outfall monitoring (including water and environmental monitoring) in accordance with the Environmental Approvals and as set out in the Environmental Management Plan.

16.15.8 Design Life

- a) The Contractor must perform the Operation Service to ensure the Desalination Plant (and each individual component) satisfies the minimum Design Life requirements set out in Table A -1 at times during the 7-year Operation Service Period
- b) Employer may perform condition assessments of the Desalination Plant at 24-month intervals (or more frequently) during the Term and to ensure compliance with this section.

16.15.9 Other requirements

- a) The Contractor must, at its own cost, provide Employer's Representative with:
 - i. Office space and facilities at the Desalination Plant (in the administration/control building overlooking the RO system gallery) to the reasonable satisfaction of the Employer. As a minimum requirement, this must include air conditioned office space equipped with phone connections, desks, chairs and storage or filing cabinets;
 - ii. Two computer workstations equivalent to those used by the Contractor, each with SWRO Desalination Plant Control System/SCADA access, internet access to a level equal to that used by the Contractor. Plant Control System/SCADA access must be password protected and must provide visual level access to all areas of the SWRO Desalination Plant i.e. no ability to control or change process set points.
- b) All items will be the property of the Employer at hand back at the end of the Operation Service Period.

16.15.10 Water Quality Tests

- a) The Contractor must, as a minimum, conduct the Water Quality Tests to ensure individual plant items and process equipment are kept in good order. These tests include but should not be limited to the following:
 - i. Seawater quality;
 - ii. Inter-process water quality;
 - iii. Potable water quality
- b) The type, number and duration of tests to be conducted by the Contractor may change from time to time according to the requirements of the Employer and especially during incidents.

16.15.11 Calibration and Verification of Performance of Drinking Water Flow Meters

- a) All Flow Meter(s) must be subject to at least an annual volumetric test to verify the electronic accuracy
- b) Flow testing must not disrupt the normal operation of the SWRO Desalination Plant unless approved by the Employer
- c) All volumetric testing should comply with Sri Lanka national standards
- d) The Contractor must provide the Employer with details of the methodology, including primary equipment required to achieve the desired accuracy.
- e) The Employer reserves the right to seek the Contractor to provide independent verification of the flow meter testing.
- f) The flow meters used must be electromagnetic flow meters (not insertion type) and must be calibrated in accordance with the manufactures specifications.

16.15.12 Annual Capacity Test

16.15.13 Contractor's Management Plans

- a) The following plans must be reviewed and updated by the Contractor annually and any changes must be submitted to the Employer for its review and comment:

- i. Asset Management Plan
 - ii. Code of Conduct
 - iii. Commissioning and Acceptance Testing Plan
 - iv. Communications Plan
 - v. Compliance Register
 - vi. Construction Staging Plan
 - vii. Construction Works Plan
 - viii. Corrosion Protection Plan
 - ix. Data and Information Management System
 - x. Durability Plan
 - xi. Emergency Management Plan;
 - xii. Incident Management Plan;
 - xiii. Information Management System
 - xiv. Maintenance Management System
 - xv. Membrane Preservation Plan
 - xvi. Monitoring and Reporting Program
 - xvii. NWSDB Staff Capacity Building Plan
 - xviii. Operate Service Plan
 - xix. Project Management Plan
 - xx. Quality Management Plan
 - xxi. Risk Management Plan
 - xxii. Safety Management Plan;
 - xxiii. Security Management Plan;
 - xxiv. Site Plan
 - xxv. Staff Roster
 - xxvi. Standard Operating Procedures
 - xxvii. Transition Plan
 - xxviii. Water Quality Manual
- b) The Contractor’s Management Plans must satisfy:
- i. The requirements of the Contract.
- c) The Contractor’s Management Plans must:
- i. consider and address any External Requirements (including the Project Environmental Approvals, Operating licence or local fishing community and other stakeholder needs;
 - ii. consider the overall management system, including structure and responsibilities that will be developed and implemented by the Contractor to ensure that the Operation Service Services comply with the requirements of the Contract
 - iii. include the any subsidiary plans describing the system requirements, processes and activities relating to specific management functions that the Contractor must comply with in performing the Operation Service Services and the operation of the Desalination Plant including safety, environment, communications, risk, critical infrastructure protection, change and incidents

16.15.14 Compliance with Management Plans

Compliance with Management Plans;

- a) The members of the Contractor’s management team responsible for specific management functions must be responsible for the Contractor’s compliance with the relevant Management Plan.
- b) The member of the Contractor’s management team responsible for interface management must be responsible for the Contractor’s compliance with the Stakeholder Interface Management Plan.

16.15.15 Contractor's Self Audits

- a) The Contractor must plan, conduct and report on self-audits of the implementation and effectiveness of its Operation Management Plan and subsidiary management plans.
- b) The Contractor must undertake the following activities in planning, conducting, reporting and action findings from self-audits:
 - i. Plan and undertake self-audits to demonstrate to Employer's satisfaction that the implementation of the Contractor's Management Plan and subsidiary management plans complies with the requirements of the Contract.
 - ii. The planning of self-audits must involve Employer's Representative. The Contractor must schedule at least one internal audit each quarter, commencing no later than three months from the commencement of Operations.
 - iii. Self-audits are to be conducted by appropriate trained auditors
- c) Self-audits are to review and assess:
 - i. the adequacy of the documented management processes to meet the requirements of the Contract, as well as requirements of State and National laws, statutory and other requirements;
 - ii. areas where the documented management processes may be improved;
 - iii. satisfactory implementation of the documented management processes;
 - iv. The maintenance of adequate compliance records by the Contractor.

16.15.16 Compliance of Contractor with requirements

- a) The Contractor must include in its Compliance Register the process and activities for ensuring the compliance of its Subcontractors with the requirements of the Contract as well as requirements of Law.
- b) The Contractor must undertake whatever supervision, surveillance, auditing and other actions required to ensure the compliance of the Subcontractor's work.

16.15.17 Audit Conducted by Employer's Representative

- a) The Employer may arrange Internal Audits of the Contractor's procedures, documentation and reporting from time to time.
- b) The Contractor must provide whatever assistance and access is required by Employer's Representative to conduct audits on the Contractor and or any of its Subcontractors.
- c) In addition to any planned audits, Employer's Representative may elect to conduct short notice audits and immediate audits, such as may be necessary following incidents. The Contractor must act on the audit findings in the same manner and timeframe as those identified by internal audits.
- d) Contractor's corrective action processes
 - i. The Contractor must establish a corrective action process
 - ii. The process for the close out of audit findings must involve a management review conducted by the Contractor within 10 Business Days of the audit report to identify actions to address the corrective actions.

The Employer and the Contractor are to jointly undertake Operate Service Audits as set out in the Contract Terms and Conditions.

16.15.18 Compliance Records

The Contractor is to keep all data and records obtained as a result of its Operation Service of the works under this contract and freely make these available to the Employer upon request. Data and records may be modified or destroyed only with the approval of the Employer.

Compliance records must include:

- a) registers of supporting information;
- b) records referred to in the registers;
- c) records relating to internal and external audits;
- d) Records of close out of non-conformances and audit findings.
- e) Employer's Representative may also request that specific compliance records be submitted for review. The Contractor must make such submission within five (5) Business Days of request from the Employer.
- f) In the case of failure to meet Potable Water Quality or Quantity, the response time for submission of Records to the Employer should be within 24-hours of request from the Employer.

All data and records belong to the Employer, are to be kept secure, are to be backed up and archived regularly and made available to the Employer.

16.15.19 Site security

- a) All security measures for the Site must comply with all State and National Critical Infrastructure Access and Security requirements
- b) The Contractor must operate and maintain an integrated and Site-wide security system to prevent unauthorised entry to the Site.
- c) Site security must, as a minimum, include and comply with the following:
 - i. Access Control System – working at all times and if damaged must be repaired within one shift.
 - ii. Closed Circuit TV – surveillance system working at all times; with one month additional recording facilities;
 - iii. Perimeter & inner fences – kept in good state of maintenance;
 - iv. Electronic gates – kept in good working order at all times
 - v. Intercoms – available at all times;
 - vi. Security lighting – no more than 10% of the area lighting unavailable at any time;
 - vii. Building perimeter access doors – kept in working order at all times;
 - viii. Security personnel must attend the location of an attempted or actual security breach or suspicious behaviour within 30 minutes of detection

16.15.20 Environmental Requirements

- a) The Contractor must integrate and achieve the documented environmental assessment outcomes, commitments and approval obligations for the Project.
- b) The Contractor must always exercise necessary and reasonable precautions appropriate to the nature of the work and the conditions under which the Project is to be performed to protect the environment.
- c) The Contractor must comply with the above requirements and must provide evidence of such compliance upon request by the Employer or statutory bodies - as a precondition of continued access to the Site.

16.15.21 Environmental Management Plan

- a) The Contractor must implement the Contractor's Environment Management Plan, including monitoring the work and carrying out adequate audits and site inspections to ensure that environmental control measures are in place to properly address all of the requirements of the Operating Licence and Environmental Management Plan.
- b) The Contractor is to develop its own Environmental Management Plan for approval by the Employer
- c) The Contractor must ensure that its employees and Subcontractors are familiar with and understand the requirements of the Environmental Management Plan and copies of this document must be readily available on the Site.
- d) The Contractor must review its EMP at regular intervals and ensure that it remains current.

16.15.22 Environment Incidents

- a) The Contractor must include environment incidents in its Incident Management Plan
- b) Environmental incident responses must identify sampling that would be required to respond to incidents are to be managed by the Contractor, with appropriate involvement and/or notifications to the Employer.
- c) Environmental incidents must be reported to the Employer within agreed timeframes and in accordance with the requirements of Law.
- d) The Contractor must review the environmental incidents in the Incident Management Plan and relevant risk register at regular intervals throughout the Term and, at a minimum, immediately following any incident to ensure that it remains current.

16.15.23 Environmental Monitoring

- a) Environmental monitoring must be undertaken as specified within the Operating Licence.
- b) Environmental Monitoring must be carried out in accordance with the Environmental Management Plan

16.15.24 Non-conforming work practices

- a) The Contractor must establish and maintain documented procedures to address nonconforming work practices and product for all phases of the Project commensurate with relevant clauses of ISO 9001:2000 and ISO 14001:2004.
- b) The Contractor must establish a system of non-conformance reports to record all non-conformances detected and corrective actions.
- c) Should the Contractor detect a non-conformance which presents potential or actual significant or material environmental harm, the Contractor must immediately notify the Employer, cease the nonconforming practice, rectify the nonconforming practice and implement corrective action to prevent reoccurrence.
- d) Corrective action must include at a minimum full investigation and review of any relevant manuals, procedures and plans

16.15.25 Reporting and performance evaluation

The Contractor must assess the environmental performance of the Operation Service and the environmental performance of its Subcontractors and report these in its monthly, quarterly and annual reports.

16.15.26 Communications and community relations requirements

- a) Employer is the managing and approving authority for all communications, and communication related activities and community relations activities for the Project.
- b) The Employer will notify the Contractor of any consultation activities, meetings forums and sessions that it requires the Contractor to manage, and/or attend throughout the Contract Period.
- c) During the Contract Period where the potential impact on affected stakeholders is likely to be significant, the Contractor must work with the Employer and comply with the Employer’s directions regarding engagement with the relevant stakeholders, ensuring that:
 - i. the local community is informed of significant milestones, changed conditions, construction operations and other matters which may be of interest or concern to the community;
 - ii. Authorities and other affected parties are informed of any relevant activities;
 - iii. Employer is kept informed of community issues and consulted on decisions affecting the community;
 - iv. the specific minimum community requirements are met;

16.15.27 Safety Management requirements

- a) The Contractor must prepare a Safety Management Plan.
- b) The Safety Management Plan must describe the functional requirements, processes and activities for safety management relating to the performance of the Operation Service and the use and occupation of the Site.
- c) The primary objective of the Safety Management Plan is to ensure that risks to personnel, assets, the work environment and the public arising from the Contract and the use and occupation of the Site are reduced to the lowest level reasonably practicable.
- d) The Safety Management Plan must describe the Contractor’s intentions for achieving the above.

16.15.28 Hazard Identification and Risk Assessment Meeting

- a) The Contractor must participate in a Hazard Identification and Risk Assessment (HIDRA) prior to commencement of the Operation Service.
- b) A minimum of 2 full day meetings will be required (with additional requirements to be negotiated between the Contractor and the Employer).
- c) The HIDRA meeting(s) will be arranged and chaired by the Contractor, with the Employer and other stakeholders (as determined by the Employer) in attendance. The purpose of these meetings is to ensure that the Safety and Health risk associated with the performance of the Operation Service and the use and occupation of the Site have been identified, the risks properly assessed, and proposed controls identified.
- d) A Hazard Register and hazard control documents must be finalised at this meeting.

16.15.29 Safety Management Plan

- a) The Contractor is required to develop and implement a Safety Management System capable of managing all aspects of Safety and Health of all employees and contractors who work at or in the vicinity of the SWRO Desalination Plant and visitors who attend the site.

- b) Following the HIDRA meeting and using the Hazard Register, the Contractor must update its Safety Management Plan, which must include appropriate controls to minimise the risks of those hazards identified at the HIDRA meeting.
- c) The Safety Management Plan must meet the intent of key requirements of any other Employer Policies and Procedures identified as applicable to the performance of the Operation Service.
- d) In addition, the Safety Management Plan must include other procedures required to form part of the controls for all high - risk activities relevant to the nature of the Contract. The Contractor and its employees and Subcontractors must comply with the requirements of any such procedures referenced in the Safety Management Plan.
- e) The Safety Management Plan will form the basis by which the Contractor's Safety and Health performance will be monitored and audited by the Employer
- f) The Contractor must provide its Subcontractors with copies of the Safety Management Plan, appropriate site specific safety management plans and safe work method statements.
- g) The Contractor must ensure that all its employees, subcontractors and consultants are inducted into, and follow the requirements of, the Safety Management Plan. A copy of the Safety Management Plan must be readily available on the Site.
- h) The Safety Management Plan must comply with the requirements of the State and National laws in Sri Lanka and this document.
- i) The Safety Management Plan must be developed and updated to consider changes in Site conditions and Operation Service, and to accommodate changes to Safety practices and statutory requirements.
- j) The Contractor and all Subcontractors must operate under a single Safety Management Plan prepared by the Contractor.
- k) Employer may audit the Safety Management Plan and the Management System at any time during the term of the Contract.

For the Contract Period the Contractor is responsible for all workplaces in which the Contractor works. The Contractor must ensure that all people, including the Employer's staff, are inducted in to the workplaces they attend and follow the safety requirements associated with that workplace. All staff not complying with the Safety requirements are to be reported.

16.16 Transition Plan

16.16.1 Introduction

A Transition Plan shall be developed and available two years prior to the hand back of the operation of the plant. The purpose of the Transition Plan is to guide the transfer of the operation of the plant from the Contractor to the Employer (NWSDB). The Transition Plan shall comprise four sections; namely:

- a) People
- b) Assets
- c) Systems
- d) Spares

It is noted that some of the responsibilities for the successful implementation of the Transition Plan rest with the Contractor while some belong to the Employer. As such the Transition Plan must be the product of a collaboration between the two parties.

Finally, after the Hand Back there shall be an ongoing mentoring role for an external party.

The purpose of this document is to foreshadow the composition and structure of the Transition Plan and to inform the Bidders of its requirements.

16.16.2 Capacity Building Program

It is noted that the Contract calls for the Contractor to provide a general capacity building program for NWSDB staff. This Capacity Building Program is expected to extend for the Design-Build and Operation Service Period and is separate from this Transition Plan.

16.16.3 Transition Plan – People

At the end of the Operation Service Period the NWSDB shall have a competent Operations Team capable of operating the plant without oversight. The definition of ‘competent’ here means a combination of knowledge, experience and attitude. In addition, the NWSDB shall have successors to the key roles within the Operations Team.

16.16.3.1 Transition Plan – People – Positions

The roles at the treatment plant are divided into two groups which are key positions and support positions. Key positions are those where the incumbent would be required to have full competency at the Hand Back whereas Support Positions are those where the incumbent would be expected to have approximately 70% competency at the Plant Hand Back. Table 16-6 summaries these positions.

Table 16 - 6 Treatment Plant Positions

Management	Process Team	Mechanical and Electrical Team	Plant Operators	Maintenance Team
Key Positions				
<ul style="list-style-type: none"> Plant Manager 	<ul style="list-style-type: none"> Process Team Lead 	<ul style="list-style-type: none"> Mechanical Team Lead Electrical Team Lead 		<ul style="list-style-type: none"> Maintenance Team Lead
Support Positions				
<ul style="list-style-type: none"> Senior Administrator Finance and Procurement Officer Administration Officer IT Officer Driver Groundsman 	<ul style="list-style-type: none"> Process Engineer SCADA Officer 	<ul style="list-style-type: none"> Mechanical Technician Electrical Technician 	<ul style="list-style-type: none"> Senior Operator Operator Operator Operator 	<ul style="list-style-type: none"> Maintenance Technician Maintenance Technician

16.16.3.2 Transition Plan – People – Selection

Both the Employer and the Contractor shall be engaged in the selection of the key personnel and shall have an equal say in selecting the recommended candidates. The people shall be selected based upon both the people’s existing knowledge, experiences and attitudes and the potential of those people to grow further into their roles and become future technical leaders.

The Employer shall select all the personnel for the support positions.

16.16.3.3 Transition Plan – People – Knowledge

The selected people for the key positions shall be assumed to have a knowledge of their speciality in engineering as reflected by the mandated qualifications. However, there is further knowledge to be gained by undertaking specialised desalination courses and by visiting operational desalination plants.

(a). Specialised Courses

There are several short courses in desalination technology on the market. Examples may be found at <http://iwes.com.au/> and <http://desalination.edu.au> . In addition, subjects within coursework Masters Programs at several Universities also address this need.

Those selected for key roles within the plant would be expected to attend these desalination courses. Those selected as potential successors (see below) would also be expected to attend.

(b). Visits

Knowledge can also be gained by visiting other operational desalination plants and talking to operational personnel. Within the second last year of the Operate Service Period a tour of desalination plants must be organised for the incumbents of the key positions and their successors. This has the added benefit of connecting with a network of desalination plant operators.

16.16.3.4 Transition Plan – People – Experience

Those selected for key roles would also benefit by working in an operating desalination plant, and provision must be made for this to occur in the Jaffna Plant within the last twelve months of the Operation Service Period.

To broaden this experience, it would also be beneficial to also work in other desalination plants on, for example, one to two month placements. Such a program could be arranged through the International Desalination Association, <http://idadesal.org/>, especially if the NWSDB were to become a member of that organisation.

16.16.3.5 Transition Plan – People – Attitude

One important characteristic of the operation of a desalination plant is the teamwork of those charged with this responsibility. Very different skill sets are brought together and must work in harmony for the plant to operate at peak efficiency and reliability. It follows that the selection process must include both ‘hard’ (qualification and experience) and ‘soft’ (behaviour) selection criteria. Attributes like teamwork and openness, and values like respect and integrity must be explored through interview questions and referee comment with the outcome influencing the selection.

16.16.3.6 Transition Plan – People – Succession

The Employer shall prepare a succession plan of each of the key staff. The succession plan shall provide an understudy to each of the key staff (which may or may not be one of the support staff). The key staff successors are expected to participate in all the technical training, and may undertake sabbatical roles at the plant from time to time. However, these staff (unless they are support staff) shall not normally be located at the plant and shall be undertaking other technical duties elsewhere.

16.16.3.7 Transition Plan – People – Ongoing Mentoring

The Employer shall arrange for an ongoing technical mentoring program for its key staff. This shall be separate from the Contract and the Employer may or may not use the Contractor for this purpose.

16.16.4 Transition Plan – Assets

16.16.4.1 Transition Plan – Assets – Introduction

Assets are all those items created as part of the Design-Build Period, or subsequently created by additional agreement between the Employer and Contractor. Table 16 - 7 provides an overview of these assets.

Table 16 - 7 Overview of Assets

Works Included in Transition Plan			Works Excluded from Transition Plan	
Intake and Outfall Works	Treatment Plant Works	Site Buildings, Services and Amenities Works	Product Water Storage and Transfer Works	Site Access Works
Intake Structure	Pre-Treatment System	Site and Building Access and Security	Storage Tank	New Access Road
Intake Pipeline	Reverse Osmosis System	Electricity Supply and HV Room	Pump Station	Existing Access Road
Intake Screens	Post-Treatment System	Water Supply	Transmission Pipeline	Waterway Crossings Lagoon -
Intake Pump Station	Disinfection System	Sewage and Waste Disposal	Connection to Existing Transmission Main	Waterway Crossings Culverts -
Intake Dosing System	Neutralisation Pit	Telecommunications		
Outfall Pipeline	Retention Tank	Roads, Parking and Pathways		
Outfall Diffuser	Chemical Storage Area	Landscaping		
	Chemical Unloading Area	Buildings <ul style="list-style-type: none"> • Administration • Store • Store (Membrane) • Laboratory • Workshop • Computer Room • Accommodation 		
Instrumentation and Control Systems (ICS) and SCADA			ICS and SCADA by Others	

16.16.4.2 Transition Plan – Assets – Condition Assessment

During the seven years of operation the assets shall suffer wear and tear. The assets shall have undergone maintenance and some shall have been renewed. The Asset Management System shall contain a detailed list of all the assets and their respective design lives and costs to create. The Contract has required the Contractor to operate and maintain the assets such that they reach their design lives.

A list of the assets shall be prepared showing their date of creation, their respective design lives and their respective theoretical historical values and residual lives.

Six months prior to the date of the Hand Back a condition assessment of each of the assets shall be arranged. The assessment shall be conducted by an independent third party. The assessment shall be overseen jointly by the Contractor and the Employer.

The assessor shall be a company experienced in the operation and maintenance of water treatment plants. The standard which shall underpin the assessment is the expected deterioration of well-maintained assets in a commercially operated water treatment plant.

From the condition assessment, the assessed residual life of each asset shall be added to the list of assets referred to above. Where the assessed residual life of an asset is greater than the theoretical residual life of an asset the assessed residual life of the asset shall be made equal to the theoretical residual life of the asset.

The gap between the assessed residual life of each asset and the theoretical residual life of an assets shall then be determined.

This gap analysis may reveal assets that have deteriorated more rapidly than expected. The analysis shall also reveal the excess degree of deterioration.

The Employer and the Contractor shall each have an opportunity to review the condition assessment. Where there is a dispute regarding an assessment the dispute process in the FIDIC Gold Book shall be used. For the purposes of the Contract each condition assessment gap shall be considered a defect.

16.16.4.3 Transition Plan – Assets – Make Good

For the assets, the Contractor is obliged to make good the assets that have deteriorated beyond what would be considered normal wear and tear. Using the example shown in Table 16 - 8 an asset that cost \$100,000 and had an expected life of 50 years was assessed after seven years to have a residual life of only 35 years, not the 43 years that would have been expected. This means that the asset had lost \$2,667 in value above that which it would have been expected to lose if it was to reach its normal asset life.

Table 16 - 8 Assessed Compensation

Asset Life	50	years	New cost	\$100,000
After 7 years				
Expected residual life	43	years	Residual value	\$86,000
Assessed residual life	35	years	Residual value	\$83,333
Lost value				\$2,667

In this case the Contractor has the choice of repairing the asset to a state where it would be expected to reach its expected asset life or of compensating the Employer to the amount of \$2,667.

Where the Contractor does not repair an asset, or does not compensate the Employer for a loss of value the Employer has the right to access the equivalent compensation amount from the Asset Replacement Fund or the Performance Guarantee.

16.16.4.4 Transition Plan – Assets – Hand Back

At Hand Back the Contractor shall return all assets and related databases, information systems and records, including as built and maintained drawings, to the Employer.

16.16.5 Transition Plan – Systems

16.16.5.1 Transition Plan – Systems – Introduction

Systems include the various computer and quality systems used to run the plant and administration. They range from the SCADA and Control Systems through to the other the safety, financial and administration systems. Each of these systems is expected to be current, documented and where relevant supported.

The systems include the following:

- a) Asset management system
- b) Emergency management system
- c) Environmental management system
- d) Financial management system
- e) Incident management system
- f) Information management system
- g) Inventory system
- h) Maintenance management system
- i) Monitoring and recording system
- j) Plant control system (including program logic controllers)
- k) Quality assurance system
- l) Safety and health system

- m) SCADA System
- n) Security system
- o) Staff roster system

16.16.5.2 Transition Plan – Systems – Audit

Six months prior to the date of the Hand Back an audit of the systems shall be arranged. The audit shall be conducted by an independent third party. The audit shall be overseen jointly by the Contractor and the Employer.

The auditor shall be a company experienced in the operation and maintenance of water treatment plants. The standard which shall underpin the audit is the prevailing practice in a commercially operated water treatment plant.

The Employer and Contractor are to agree a list of the systems to be audited, which would be similar to the list provided above. The auditor is to conduct an analysis of the systems as follows:

- a) For each system, the prevailing practice (benchmark)
- b) For each system, the current state
- c) For each system, the gap between the prevailing practice and the current state
- d) For each gap the recommended remedial action
- e) A scope and program of work comprising the recommended remedial actions

The Employer and the Contractor shall each have an opportunity to review the program of work. Where there is a dispute regarding the scope of remedial works the dispute process in the FIDIC Gold Book shall be used. For the purposes of the Contract each remedial action shall be considered a defect.

16.16.5.3 Transition Plan – Systems – Make Good

When the scope of work has been settled, or for agreed items beforehand, the Contractor shall undertake the remedial actions prior to the date of Hand Back. Where the Contractor has not undertaken the remedial actions, or has only partially undertaken a remedial action at Hand Back, the Employer may step in and undertake the work itself and draw on the Asset Replacement Fund and the Performance Security for the cost of the work.

16.16.5.4 Transition Plan – Systems Hand Back

At Hand Back the Contractor shall transfer all systems, system related materials, warranties, guarantees and licences into the ownership of the Employer. All intellectual property related to the Plant and its operation shall fully transfer to the Employer.

16.16.6 Transition Plan – Spares

16.16.6.1 Transition Plan – Spares – Inventory

An inventory of spares, including critical spares, has been established during the Operate Service Period. The number of each stocked item is held in the inventory management system.

16.16.6.2 Transition Plan – Spares – Make Good

Three weeks prior to the date of Hand Back the Employer and the Contractor shall jointly undertake a stocktake of the inventory. Missing inventory shall be noted and the Contractor shall restock the missing inventory.

Where the Contractor has not restocked the inventory by the date of Hand Back, the Contractor may step in and restock the inventory itself and draw on the Asset Replacement Fund and the Performance Security for the cost of the restocking.

CHAPTER 17. PROJECT MANAGEMENT

17.1 Introduction

This Chapter provides an outline of the degree of project management expected on this Project. Bidders are requested to provide information on their respective approaches to project management and its deployment on this Project. Bidders should also indicate the project management tools they intend used.

The method of project management that the contractor wishes to deploy should be identified. This may be an internationally accepted methodology or a standard one used by the Bidder’s company. In the case of the latter and without giving away intellectual property advantage a description of the methodology should be provided.

17.2 Period

This Chapter on Project Management covers both the Design-Build (DB) Period and the Operation Service (OS) Period. The Contractor is required to exercise good project management in undertaking the design and build of the assets and the operation and maintenance of the assets.

17.3 Standards

17.3.1 General Standards

Standards underpin any quality system. The following list of standards have been adopted for this Project and will be used as a reference by the Employer in considering the Bidder’s proposals. Alignment with these Standards is considered desirable.

- a) ISO 10006:2003 Quality Management Systems
- b) ISO 14000:2015 Environmental Management
- c) ISO 21500:2012 Guidance on Project Management
- d) ISO 31000:2009 Risk Management
- e) ISO 45001:2016 Occupational Health and Safety (draft)
- f) ISO 55000:2014 Asset Management
- g) Standard Methods for the Examination of Water and Wastewater: Published by American Public Health Association, American Water Works Association, Water Environment Federation
- h) IFC Environment Health and Safety Guidelines
- i) IFC Environment Health and Safety Guidelines for Water and Sanitation Projects.

17.3.2 Technical Standards

In addition to the general standards technical standards shall be used. These standards have been listed in Section 6 – Attachment 2: A.2.7.a.

17.4 Time

An indicative timeframe for this project is contained in Table 17-1. Bidders are to prepare their own schedules.

Table 17-1 Indicative Timeframe

Phase	Estimated Duration (Days)	Estimated Duration (Months)	Running Total (Days)	Running Total (Months)	Running Total (Years)	
Design	120	4	120	4	0.33	Design-Build Period
Design - Review	60	2	180	6	0.5	
Build	630	21	810	27	2.25	
Build - Commission	90	3	900	30	2.5	
Operate - Normal	1800	60	2,700	90	7.5	Operation Service Period
Operate - Skills Transfer	660	22	3,360	112	9.33	
Operate – Hand back	60	2	3,420	114	9.5	

In its proposal, the Bidder shall describe the method it proposes to use to manage the time required for the DB period. Table 17-1 shows the Design Phase as six months and the Build Phase as two years. The Bidder is to describe the techniques it proposes to use to deliver the DB of this Project within this time. Examples from past projects of how these techniques have been successfully used shall be provided.

17.5 Budget and Costs

The Contractor’s price for the DB and OS (including the Provisional Sums) will establish the budget for the Project. The Project is well defined and employs an already mature technology in a Greenfield setting and as such there are not expected to be any variations. The other parameter that controls cost is quality. The Employer will be using quality assurance and control procedures to ensure quality is maintained and not eroded to achieve a budget. The successful Bidder will be held to account and expected to deliver the quality implied in its proposal. Rework will be required where quality falls below an accepted level. In its proposal, the Bidder is to describe the method it proposes to use to manage the costs of the Project for the DB and OS Periods, to eliminate variations and deliver the whole Project within the awarded price without compromising quality. Examples from past projects shall be provided.

17.6 Quality

A quality outcome is expected from the Contractor. In its proposal, the Bidder is to describe the method it proposes to use to manage the quality of the Project for the DB and OS Periods. Methods would include the use of the development of a quality plan and the use of

a quality assurance system, works inspections, equipment and materials testing and inspections, use of well qualified personnel, planned maintenance programs and an open rapport with the Employer. A quality process is expected to be used to address both the construction of assets and the maintenance of assets.

The Employer will also deploy a quality system in its own in project managing the project. It would be advantageous of both the Employer’s quality management system and the Contractor’s quality management system worked in tandem and this is to be encouraged. The Bidders are to consider this in their proposals. The Bidders are also asked to provide examples from past projects where it they used quality to achieve and excellent outcome for a client.

17.7 Auditing

Audits are critical component of a continuous improvement process. Audits will be used by the Employer as a means of continuous improvement and not as a punitive measure. Audits have the purpose of addressing the following:

- a) That business systems are functional and efficient
- b) That processes are fit-for-purpose and efficient
- c) That reports are comprehensive and accurate
- d) That non-conformances are reported and addressed

In its proposal, the Bidders are to describe the methods they propose to use to manage the self-auditing of the Project for the DB and OS Periods. The Bidders are required to participate in the Operate Service Audits described in the Gold Book and Internal Audits arranged by the Employer and undertake its own self-audits.

Auditing is also referred to elsewhere in this Bidding Document. However, the recognition of the different types of audits and their uses needs to be included in the Bidders’ proposals. For clarity, the range of Operate Service Audits is included in Table 17-2. Internal audits by the Employer and self-audits by the Contractor are expected to address the same range.

Table 17-2 Operate Service Audits

Operation Service Audits		
Functional Requirements	Compliance Requirements	Commercial Requirements
Delivery of water	Safety	Variations and adjustments
Management of assets	Environmental	Contract price and payments
Management of incidents	Social	Claims, disputes and arbitration
Management of emergencies	Financial	
Protection of reputation	Permits	
Management of project	Quality	
	Contract	

17.7.1 Scope of Services for the Operation Service Auditing Entity

Introduction

The Auditing Entity shall be appointed at least 182 days prior to the commencement of the Operation Service, following a competitive selection process, in accordance with ADB’s Guidelines on the Use of Consultants, to carry out an independent and impartial audit during the Operation Service.

The purpose will be to audit and monitor the performance of both the Employer (particularly in regard to meeting its financial obligations) and the Contractor (particularly in regard to meeting its service delivery obligations) during the Operation Service Period and their compliance with the Operation Service Requirements.

The Auditing Body shall commence its duties at least 30 days before commencement of the Commissioning Period.

Notwithstanding that the Auditing Body is engaged by the Employer, the Auditing Body shall act independently and impartially. The Audit Body shall audit and monitor the performance of both the Contractor and Employer.

Scope of the Services of the Auditing Body

The scope of services of the Auditing Body shall include the following:

- a. To assess the overall performance of the Contractor against the Contract and confirm that it is meeting its obligations under the Contract as follows:
 - i. Delivering the operations and maintenance of the works in accordance with the Contract;
 - ii. Verifying the contents of reports and plans submitted by the Contractor;
 - iii. Verifying the service delivery performance as reported by the Contractor;
 - iv. Verifying the Contractor’s procedures for water quality testing and reporting;
 - v. Verifying the Contractor’s procedures for maintaining safe workplaces and for reporting on safety;
 - vi. Verifying the Contractor’s procedures for adhering to the ADB environmental and social safeguards and reporting on these; and
 - vii. Reviewing the effectiveness of training and development programs undertaken by the Contractor.
- b. To assess the overall performance of the Employer against the Contract and confirm that it is meeting its obligations under the Contract as follows:
 - i. Assessing claims (including variations) and making payments for the operations and maintenance of the works in accordance with the Contract;
 - ii. Verifying the contents of reports and plans submitted by the Employer;
 - iii. Verifying the service delivery performance as reported by the Employer;
 - iv. Verifying the Employer’s procedures for checking and inspecting the Contractor’s works delivery (quantity and quality) and the reporting on these;

- v. Verifying the Employer’s procedures for checking and inspecting the Contractor’s operations and maintenance delivery and the reporting on these; and
 - vi. Verifying the Employer’s procedures for monitoring the Contractor’s adherence to the ADB environmental and social safeguards and reporting on these.
- c. To act as an intermediary between the Employer and Contractor when differences arise and to facilitate the resolution of these differences.
 - d. To recommend matters that should be referred to the DAB for resolution.
 - e. Based upon the results of its audits and in consultation with the Employer and the Contractor prepare a draft annual performance improvement report for the Employer and the Contractor.

17.8 Social Responsibilities

The social responsibilities of the contractor include:

- a) The impact of construction activities on the local community
- b) The degree of compliance with National labour laws
- c) The commitment to National safety and Health requirements
- d) The engagement of local personnel and contractors
- e) The purchase of local goods and equipment
- f) The capacity building of NWSDB personnel
- g) Acting as a good citizen

More information on social responsibilities may be found in the Environment Management Plan.

In its proposal, the Bidders are to describe the methods they propose to use to manage the social responsibilities of the Project for the DB and OS Periods. Examples from past projects shall be provided.

17.9 Environmental Responsibilities

The Project comes with several environmental responsibilities which are listed in the Environmental Management Plan. These include the impacts of its construction and operational activities on the local environment. The importance of these is highlighted by the requirement of the Contractor to prepare its own environmental management plan at the commencement of the Project. The Contractor’s environmental management plan is expected to mirror that of the Employer.

In its proposal, the Bidders are to describe the methods they propose to use to manage the environmental responsibilities of the Project for the DB and OS Periods. Reference should be made to the development of its environmental management plan and how this plan will be deployed. Examples from past projects shall be provided.

17.10 Data and Documentation

The project will generate a considerable amount of data and documents. The Contractor is to put in place a formal information management system as part of this Contract and the Bidders are to describe this in their proposals. The information management system must

embrace both electronic and paper data and documents. The system (or systems) must allow for the correct identification of the data and documents, their storage and retrieval, their security and their back up. Data and documents will be used in audits.

In its proposal, Bidders are to describe the method they propose to use to manage the data and documentation of the Project for the DB and OS Periods. Examples from past projects shall be provided.

17.11 Reports and Meetings

The Contractor is required to submit regular and ad hoc reports throughout the DB and OS Period. Regular reports include monthly, quarterly and annual reports on the Project which describe the progress being made and the compliance being achieved. Ad hoc reports include reports on incidents, emergencies, major non-conformances, and safety incidents. The reports shall reflect quality rather than quantity, be well prepared and presented, and submitted in a timely fashion. In its proposal, the Bidders are to describe the methods they propose to use to manage the preparation of the project reports. Examples from past projects would be helpful.

Meetings are to follow the same pattern. Attendance at meetings by key personnel is considered essential. All project meetings are to have an agenda and be minuted. Meetings are to be conducted in a professional manner with openness and mutual respect on show. The Bidders approaches and examples from past projects would be helpful.

17.12 Conduct and Behaviour

Experience has shown (and it is well documented) that the most successful contracts are those where the employer and contractor enjoy a shared professional relationship. The Bidders are requested to describe how (from their perspectives) they intend developing a relationship with the NWSDB and its Project Management entity. It is suggested that developing a shared code of conduct which is regularly reviewed would be one such way. In addition, the Bidders’ attention is drawn to the following:

- a) Sri Lanka Public Service Vision and Mission (Current)
- b) Sri Lanka Code of Best Practice on Corporate Governance (2013)
- c) Institution of Engineers Sri Lanka Code of Ethics (2013)
- d) Institute of Chartered Accountants Code of Ethics (2017)

In their proposals, the Bidders should describe the methods they propose to manage their relationships with the Employer throughout the DB and OS Periods and ensure the good behaviour of their personnel and subcontractors. Examples from past projects would be desirable.

17.13 Project Organisational Structure and Key Resources

The Bidders shall provide diagrams of their proposed project organisational structures including key resources for both the DB and OS periods. The structure shall show reporting relationships, decision making authorities and links back to off-shore parent company(s). Roles, responsibilities and delegated authorities shall be shown.

17.14 Project Management Supporting Information

The documents that support Project Management are listed below;

- a) Outline of Communications Plan
- b) Outline of Communications Plan
- c) Outline of Construction Works Approach
- d) Outline of Data and Information Management System
- e) Outline of Environmental Management Plan
- f) Outline of Information Management System
- g) Outline of Monitoring and Reporting Approach
- h) Outline of Behaviour and Conduct Approach
- i) Outline of Quality Assurance System
- j) Outline of Risk Management Approach
- k) Outline of Workforce Management Approach

ATTACHMENTS (REFER ENCLOSED CD)

Refer enclosed CD for Attachments

ATTACHMENT 1 – REQUIREMENTS FOR USEFUL LIFE OF KEY EQUIPMENT

A.1 Required Minimum Useful Life of Key Plant Equipment

**ATTACHMENT 2 –
SWRO DESALINATION PLANT SITE AND POTABLE WATER
CONVEYANCE ROUTE RELATED INFORMATION**

A.2.1: Topographic Survey and Map of the SWRO Desalination Plant Site and Potable Water Conveyance Route

A.2.1.a: Topographic Survey and Map of the SWRO Desalination Plant Site

A.2.1.b: Topographic Survey and Map of the Potable Water Conveyance

A.2.2: Geotechnical Survey of the SWRO Plant Site, Onshore Intake and Outfall Pipeline Route and Potable Water Conveyance Route

A.2.3: Field Investigation Data - Bathymetric Survey of the Intake and Outfall Area, Sub Bottom Profile Survey, Water Level and Current Measurement and Sea Bed Sediment and Water Quality Survey

A.2.3.a: Bathymetric Survey of the Intake and Outfall Area

A.2.3.b: Sub Bottom Profile Survey

A.2.3.c: Water Level and Current Measurement

A.2.3.d: Sea Bed Sediment

A.2.3.e: Water Quality – Sea Water

A.2.3.f : Water Quality - Lagoon

A.2.4: Concentrate Dispersion Modelling Report

A.2.5: Potable Water Conveyance & Water Delivery Point to the JKWSSP Water Supply System

A.2.5.a: Report on Potable Water Conveyance

A.2.5.b: AutoCad drawing for route of the Potable Water Conveyance

A.2.6: RDA requirements for Pipe trenches, backfilling and reinstatement

A.2.7: General Specifications and Bridge & Culvert Crossing Details

A.2.7.a: General Specifications

A.2.7.b: Bridge & Culvert Crossing Details

A.2.8: Environmental Impact Assessment Report of the SWRO Desalination Plant Site and Environmental Management Plan

A.2.8.a. Environmental Study Report - SWRO Plant

This report has been modified (Chapter IX only) from the original report prepared by LHI to add sections on Environmental Considerations and Monitoring by Contractor – Refer A.2.8.c for Environmental Considerations.

A.2.8.b. Environmental Study Report - Potable water transmission route

A.2.8.c. Environmental Considerations

**ATTACHMENT 3 –
POTABLE WATER QUALITY REQUIREMENTS AND STANDARDS
FOR EFFLUENT DISPOSAL AND SOLID WASTE DISPOSAL**

A.3.1 Key Potable water Quality Requirements

A.3.2 Standard for Effluent Disposal

A.3.3 Standards for Solid Waste Disposal

Refer Central Environmental Authority Guid Line

ATTACHMENT 4 – DESIGN REVIEW DELIVERABLES

Section 7 - General Conditions of Contract

The Conditions of Contract comprise two parts, this Section 7 - General Conditions of Contract (GCC) and Section 8 - Particular Conditions of Contract (PCC).

The General Conditions shall be the Conditions of Contract for Design, Build and Operate Projects (Gold Book) prepared by the Fédération Internationale des Ingénieurs-Conseil, (FIDIC) First Edition 2008, copyrights of which are held by FIDIC.

A copy of these Conditions of Contract is not issued with the Bidding Document. Bidders are expected to purchase a copy from FIDIC, if not already available with them.

Section 8 – Particular Conditions of Contract

The Conditions of Contract comprise the "General Conditions", which form part of the "Conditions of Contract for Design, Build and Operate Projects First Edition 2008" published by the Fédération Internationale des Ingénieurs-Conseils (FIDIC), "Particular Conditions Part A – Contract Data" and "Particular Conditions Part B – Special Provisions", which include amendments and additions to such General Conditions..

Whenever there is a conflict, the provisions of the Particular Conditions shall prevail over those in the General Conditions, and the Particular Conditions Part A – Contract Data shall prevail over the Particular Conditions Part B – Special Provisions and its appendices.

All reference Clauses and Sub-Clauses provided in the Particular Conditions shall be construed as reference Clauses and Sub-Clauses in the General Conditions.

1. Part A: Contract Data

Sub-Clause	Data to be given	Data
1.1.24	Where the Contract allows for Cost Plus Profit, percentage profit to be added to the Cost:	5%
1.1.26	Cut-Off Date (number of days after the Time for Completion of Design-Build):	60 days
1.1.32	Employer's name and address	National Water Supply and Drainage Board Galle Road Ratmalana, Sri Lanka
1.1.35	Employer's Representative's name and address:	Name: General Manager Address: National Water Supply and Drainage Board Galle Road, Ratmalana, Sri Lanka Tel: (0094) 112 638999 Ext 1750 Fax: 0094 112 635885 Email: agmtenders@waterboard.lk
1.1.70	Parts of the Works that shall be designated a Section for the purposes of the Contract:	Not applicable
1.1.78	Time for Completion of Design-Build:	As specified in Contract Data for PCC 9.2
1.3	Agreed methods of electronic transmission:	Facsimile or electronic mail only Fax: +94-11-2635885 Email: agmtenders@waterboard.lk
1.3	Address of Employer for communications:	Assistant General Manager (Tenders and Contracts) National Water Supply and Drainage Board Galle Road, Ratmalana. Sri Lanka Tel: +94-11-2605328 (Ext 1750) Fax: +94-11-2635885 Email: agmtenders@waterboard.lk
1.3	Address of Employer's Representative for communications:	Name: General Manager Address: National Water Supply and Drainage Board Galle Road, Ratmalana, Sri Lanka Tel: (0094) 112 638999 Ext 1750

Sub-Clause	Data to be given	Data
		Fax: 0094 112 635885 Email: agmtenders@waterboard.lk
1.3	Address of Contractor for communications:	[To be entered]
1.4	Contract shall be governed by the law of:	The Democratic Socialist Republic of Sri Lanka
1.4	Ruling language:	English
1.4	Language for communications:	English
2.1	After receiving the Letter of Acceptance, the Contractor shall be given right of access to all or part of the Site within:	Within 7 days from the date of the Letter of Acceptance for non-invasive work. Full right of access would be given immediately after submission of Performance Security and stipulated Insurance Cover
4.2	Performance Security (as percentages of the Accepted Contract Amount in Currencies): Percent Currency	a. For Performance Security (Design-Build); 8% of the Letter of Acceptance (LoA) Design-Build Price – to be reduced to 2% of the LoA Design-Build Price at the issue of the Commissioning Certificate and which 2% is returned at the completion of the Retention Period. b. For Performance Security (Operation Service): 12% of the Letter of Acceptance (LoA) Operation Service Price – to be reduced to 7% after three years of delivery of the Operation Service and returned 21 days after receiving a copy of the Contract Completion Certificate. In the currencies and proportions of the Accepted Contract Amount for Design-Build and Operation Service specified in the Letter of Acceptance.
4.2	Reduction in Performance Security at the end of the Retention Period:	-
5.1	Period for notification of errors, faults and other defect is:	120 days from the Commencement Date.
5.2	Contractor's Documents requiring approval:	As per the Section 6 Employer's Requirements: Chapter 3: Clause 3.15
6.5	Normal working hours on the Site:	During the Design Build Period: 08.00 hours to 17.00 hours including one hour of break time. However such hours may be adjusted for needs of the different parts of the Works with the approval of the Employer's Representative, subject to labour regulations. During the Operation Service Period: As necessary to fulfil the requirements of the Operation Service.
8.2	Period of the Operation Service:	2,555 days from the date stated in the Commissioning Certificate

Sub-Clause	Data to be given	Data
9.2	Time for Completion of Design-Build:	910 days from the Commencement Date.
9.2	Time for Completion of each Section: Section Time for Completion	Not Applicable Days
9.6	Delay damages (percent of the Accepted Contract Amount):	0.1% of the cost of the balance work of the Design-Build per day for period beyond the original time period
9.6	Maximum amount of delay damages (percent of the Accepted Contract Amount):	10%
10.6a	Maximum compensation payable by Contractor:	10% of the Accepted Contract Amount for Operation Service.
10.6b	Maximum compensation payable by Employer:	0% of the Accepted Contract Amount for Operation Service.
10.7	Performance Damages The maximum amount of damages payable by the Contractor in respect of failure to meet the standards specified in the Schedule of Guarantees shall not exceed:	As specified in Appendix 7 to the Contract Agreement 20 % of the total amount stated in the Letter of Acceptance for the Operation Service and the Asset Replacement Fund.
10.7	Right of Employer if failure continues for more than 84 days:	As per GCC 10.7
10.7	Minimum production outputs required	As specified in the Schedule of Guarantees in Appendix 7 to the Contract Agreement
13.5	Percentage rate to be applied to Provisional Sums:	"Maximum up to 5%"
13.8	Schedule of Adjustment Data	As specified in Appendix 2 to the Contract Agreement
14.2	Amount of Advance Payment (percent of Accepted Contract Amount):	As specified in Appendix 1 to the Contract Agreement
14.2	Currencies of payment if different to the currencies quoted in the Contract	Not Applicable
14.3	Percentage of Retention:	10%
14.3	Limit of Retention Money:	5% of the Accepted Contract Amount for the Design-Build
14.6(b)(i)	Plant and Materials for payment when shipped:	As specified in Appendix 1 to the Contract Agreement

Sub-Clause	Data to be given	Data
14.6(c)(i)	Plant and Materials for payment when delivered to the Site:	As specified in Appendix 1 to the Contract Agreement
14.7	Minimum Amount of Interim Payment Certificate applicable for the Design-Build. Minimum Amount of Interim Payment Certificate applicable for the Operation Service.	1% of the Accepted Contract Amount for the Design-Build No Minimum
14.9	Financing charges for delayed payment:	not applicable
14.17	Currencies for payment of Contract Price:	The currencies of payments shall be the currency or currencies in which the bid price of the successful bidder is expressed.
14.17	Proportions of Local and Foreign Currencies are:	As specified in the Letter of Acceptance
14.17	Rate of Exchange	Not Applicable
14.17	Payment of damages shall be:	Sri Lankan Rupees
14.19	Amount of Maintenance Retention Fund:	5% of the Accepted Contract Amount for the Operation Services
17.1 b (iii)	Operation of forces of nature allocated to the Contractor:	-
17.8	Total liability of the Contractor shall not exceed:	100 % of the Accepted Contract Amount

Sub-Clause	Data to be given	Data
19.2(a)(i)	Permitted deductible limits:	Not greater than 5 %
19.2(a)(ii)	Additional sum to be insured:	As per GCC 19.2 (a) (ii)
19.2(a)4	Employer's Risks to be insured if different to Sub-Clause 17.1:	-
19.2(a)5	Exceptional Risks to be insured if different to Sub-Clause 18.1:	-
19.2(b)	Insurance of Contractor's Equipment (amount required):	100% of replacement value
19.2(c)	Amount of professional liability insurance required:	50% of the Contract Amount for Design-Build
19.2(c)	Period for which professional liability insurance required:	From Commencement Date until two (2) years following issuance of Contract Completion Certificate
19.2(d)	Amount of insurance required for injury to persons and damage to property:	USD 10 million or equivalent in LKR
19.2(f)	Other insurances required from the Contractor (give details):	<p>Cargo Insurance, in the amount of 110% of the CIF value of items to be imported covering loss or damage occurring while in transit from the supplier's or manufacturer's works or stores until arrival at the Site, to the Works (including spare parts therefore) and to the construction equipment to be provided by the Contractor or its Subcontractors.</p> <p>An Insurance in the amount of 110% of the CIF value of items to be imported in currency(ies) the Contract Price is payable covering physical loss or damage to the Facilities at the Site, occurring prior to completion of the Facilities, with an extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the defect liability period while the Contractor is on the Site for the purpose of performing its obligations during the defect liability period.</p>
19.3(a)	Amount of fire extended cover insurance required:	50% of the Contract Amount for Design-Build
19.3(b)	Amount of insurance required to cover injury to any person and damage to property:	USD 10 million or equivalent in LKR
19.3(d)	Other insurances required by law from the Contractor (give details):	As required by Law
19.3(e)	Other optional insurances required from the Contractor (give details):	-
20.3	Date of appointment of DAB:	3 months from the Commencement Date.
20.3	The DAB shall comprise:	3 members
20.4	Appointing entity (official) for DAB members, if not agreed	The Institution of Engineers, Sri Lanka

Sub-Clause	Data to be given	Data
	between Parties	
20.8	Rules and place of arbitration:	Referencing PCC (Part B) 20.8: International arbitration shall be administered by the Singapore International Arbitration Centre (SIAC) and conducted in accordance with the rules of SIAC. The place of arbitration shall be Singapore

2. Part B: Special Provisions

Sub Clause	Provisions
1	General Provisions
1.1	Definitions
1.1.72 Site	At the end of subparagraph 1.1.72, add: The Site shall also include the area of facilities provided to Employer's Representative, areas for storage of Plant and Materials for the Works, dump yards, and all private roads covered by the Works.
1.1.84 Other Definitions	Add the additional definition: 1.1.84: The word 'tender' is synonymous with 'bid,' and the words 'tender documents' with 'bidding documents'.
1.1.85 Other Definitions	Add the additional definition: 1.1.85: The word 'ADB' means the "Asian Development Bank" and is synonymous with 'Bank'.
1.1.86 Other Definitions	1.1.86: The word "Schedule of Guarantee" is synonymous with "Functional Guarantee"
1.3 Communication	Substitute Sub-Clause 1.3 (c) with the following: (c) in writing and delivered by hand (against receipt), sent by mail or courier and also a scanned copy of the signed document transmitted by email. In case of bulky documents, only the covering letter of such submission shall be sent by email. At the end of Sub-Clause 1.3, add: (e) For the purpose of communications between the Contractor and the Employer's Representative and vice versa, appropriate forms (where relevant) shall be developed by the Contractor jointly with the Employer's Representative.
1.13 Confidential details	Delete Sub-Clause 1.13 and substitute: The Contractor's and the Employer's Personnel shall disclose all such confidential and other information as may be reasonably required in order to verify the Contractor's compliance with the Contract and allow its proper implementation. Each of them shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.
1.14 Compliance with Laws	At the end of Sub-Clause 1.14, add: However, the Contractor shall submit, in good time to the Employer, the details of Goods, where the recommendations of the Employer is necessary, who shall then on the request of the Contractor, assist as far as practicable, to obtain all import permits or licences required for these Goods in the way of recommendations and confirmations. The Employer shall also assist to obtain or grant all consents including permits-to-work, rights-of-way and approvals required for the Works.

Sub Clause	Provisions
1.16 Inspections and Audit by the Bank	<p>Insert additional Sub-Clause 1.16:</p> <p>The Contractor shall permit the Bank and/or persons appointed by the Bank to inspect the Site and/or the Contractor's accounts and records relating to the performance of the Contract and to have such accounts and records audited by auditors appointed by the Bank if required by the Bank.</p>
2	The Employer
2.1 Right of Access to the Site	<p>Amend the second sentence of the Sub-Clause as follows:</p> <p>The right and possession shall not be exclusive to the Contractor, but shall be subject to joint occupation with the right of use of public roads within the Site by the public, and by the utility service organizations, and other authorized entities, to carry out their legitimate duties within the Site if so required by them.</p>
2.4 Employer's Financial Arrangements	<p>Delete 1st paragraph and replace with the following.</p> <p>The Employer's arrangements for financing the project are as follows:</p> <p>All payments under the Contract to the Contractor shall be made by the Employer from the proceeds of a loan from the Asian Development Bank together with counterpart funding from the Government of Sri Lanka.</p>
3	The Employer's Representative
3.1 Employer's Representative's Duties and Authority	<p>Insert at end of the Sub Clause 3.1;</p> <p>Notwithstanding anything to the contrary elsewhere in the Contract, the Employer's Representative shall obtain prior approval of the Employer before taking actions under the following Sub-Clauses of these Conditions:</p> <p>(a) Agreeing or determining an extension of time and/or additional cost under Sub Clause 4.12 (Unforeseeable Physical Conditions);</p> <p>(b) Approving or accepting a proposal submitted by the contractor under Sub-Clause 13.1 (Right to Vary) , Sub Clause 13.2 (Value Engineering);</p> <p>Which would increase the Contract Price in excess of the Accepted Contract Amount or would extend the Time for Completion of Design-Build by an aggregate of two months beyond the Time for Completion of Design Build stated in Part A – Contract Data.</p> <p>Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Employer's Representative, an emergency occurs affecting the safety of life or of the Work or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibility under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Employer's Representative, be necessary to abate or reduce the risk.</p> <p>The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Employer's Representative. The Employer's Representative shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 13 and shall notify the Contractor accordingly, with a copy to the Employer.</p>
3.6 Management Meetings	<p>Insert additional Sub-Clause 3.6:</p> <p>The Employer's Representative shall invite the Contractor and other relevant parties to the Inception Management Meeting where it would be explained and decided on the modalities of administering the Contract and decide upon the intervals between future Management Meetings. It is the duty of the Contractor's Representative and his relevant key staff to participate in the Management Meetings which henceforth be normally held monthly at the Site.</p>

Sub Clause	Provisions
	<p>The purpose of these Management Meetings is to coordinate the Works with the Contractor, (and other parties if deemed necessary) to record progress in relation to agreed programme, and to reach and verify agreements.</p> <p>The Contractor will provide status of the contract Works in such detail and format as acceptable to the Employer's Representative.</p> <p>Minutes of each Management Meeting will be prepared by the Employer's Representative and circulated to all parties attending the Management Meeting, prior to the next meeting. Agreements reached at a particular Management Meeting if duly recorded and confirmed at the next meeting will be considered accepted by all parties. Where such agreements require to be confirmed by Instructions from the Employer's Representative in compliance with the Contract, the Employer's Representative shall forthwith issue such instructions.</p> <p>Agreements reached at meetings shall not be a means to override the requirements in GCC to follow stipulated procedure in submittals, notices, claims, etc. and to submit the required quality assurance documents, method statements, shop drawings, etc. in the Contract.</p>
4	The Contractor
4.1 Contractor's General Obligations	<p>Insert after second paragraph of Sub-Clause 4.1:</p> <p>All equipment, material, and services to be incorporated in or required for the Works shall have their origin in any eligible source country listed in Section 5.</p>
4.2 Performance Security	<p>Delete the entirety of Sub Clause 4.2 and substitute the following:</p> <p>The Contractor shall obtain the following Performance Securities for the proper performance of the Contract:</p> <ul style="list-style-type: none"> a) A Performance Security in respect of the Design-Build of the Works (hereinafter the "Performance Security (Design-Build)") which shall be valid and enforceable up to the scheduled date for completion of the Retention Period;; and b) A Performance Security in respect of the Operation Service (hereinafter the "Performance Security (Operation Service)") which shall become valid and enforceable on the date of commencement of the Operation Service. <p>The Performance Securities shall be in the amounts and currencies set out in the Contract Data.</p> <p>The Contractor shall deliver both Performance Securities to the Employer within 28 days after receiving the Letter of Acceptance, and shall send copies to the Employer's Representative.</p> <p>The Employer shall return the Performance Security (Design-Build) to the Contractor at the completion of the Retention Period. The Employer shall return the Performance Security (Operation Service) to the Contractor within 21 days after receiving a copy of the Contract Completion Certificate.</p> <p>The Performance Securities shall be in the form of an unconditional "On Demand" bank guarantee in the formats given in Section 9 of the Bidding Document or sent with the Letter of Acceptance, and in proportions in which the Contract Price is payable or in US Dollars, issued by a reputable commercial bank registered and operating in Sri Lanka or in other eligible country, and en-</p>

Sub Clause	Provisions
	<p>cashable at a reputable commercial bank in Sri Lanka.</p> <p>If the guarantee is to be issued by a bank outside Sri Lanka, it shall be from a bank that has a correspondent bank in Sri Lanka to make it enforceable and en-cashable.</p> <p>Banks in Sri Lanka issuing the bank guarantee or as corresponding bank to a foreign bank shall be one registered and supervised by the Central Bank of Sri Lanka.</p> <p>The Contractor shall ensure that it has a valid and enforceable Performance Security in place at all times until the issue of the Contract Completion Certificate. If the Contractor has not become entitled to receive the Commissioning Certificate by the date 28 days prior to the expiry date of the Performance Security (Design-Build) the Contractor shall extend the validity of the Performance Security (Design-Build) as necessary until the Commissioning Certificate has been issued. Failure by the Contractor to maintain the validity of a Performance Security shall be grounds for termination in accordance with Sub-Clause 15.2 [Termination for Contractor's Default].</p> <p>The Employer shall not make a claim under a Performance Security except for amounts to which the Employer is entitled under the Contract in the event of:</p> <p>(a) failure by the Contractor to extend the validity of the Performance Security as described in the preceding paragraph, in which event the Employer may claim the full amount of the Performance Security;</p> <p>(b) failure by the Contractor to pay the Employer an amount due, as either agreed by the Contractor or determined under Sub-Clause 3.5 [Determinations] or Clause 20 [Claims, Disputes and Arbitration], within 42 days after this agreement or determination;</p> <p>(c) failure by the Contractor to remedy a default within 42 days after receiving the Employer's Notice requiring the default to be remedied; or</p> <p>(d) circumstances which entitle the Employer to terminate under Sub-Clause 15.2 [Termination for Contractor's Default], irrespective of whether Notice of termination has been given.</p> <p>The Employer shall indemnify and hold the Contractor harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the Performance Security which the Employer was not entitled to make.</p> <p>Without limitation to the provisions of the rest of this Sub-Clause, whenever the Employer's Representative determines an addition or a reduction to the Contract Price as a result of a change in cost and/or legislation or as a result of a Variation, amounting to more than 25 percent of the portion of the Accepted Contract Amount payable in a specific currency, the Contractor shall at the Employer's Representative's request promptly increase, or may decrease, as the case may be, the value of the Performance Security in that currency by an equal percentage.</p>
<p>4.3 Contractor's Representative</p>	<p>Insert at the end of Sub-Clause 4.3:</p> <p>If the Contractor's Representative is not fluent in the language for communications defined in Sub-Clause 1.4 [<i>Law and Language</i>], the Contractor shall make a competent interpreter or interpreters available during all working hours.</p>
<p>4.4</p>	<p>Insert at the end of Sub-Clause 4.4:</p>

Sub Clause	Provisions
Subcontractors	<p>The Contractor shall ensure that the requirements imposed on the Contractor by Sub-Clause 1.13 [<i>Confidential Details</i>] apply equally to each Subcontractor.</p> <p>Where practicable, the Contractor shall give fair and reasonable opportunity for contractors from the Country to be appointed as Subcontractors</p>
4.7 Setting Out	<p>At the end of first paragraph in Sub-Clause 4.7, add:</p> <p>When setting out any part of the Works, the Contractor shall give the Employer's Representative sufficient notice (not less than 24 hours) to enable the Employer's Representative also to satisfy itself to the correctness of the setting out, before the Contractor commences construction of the part concerned. However this will not relieve the responsibility of the Contractor for the correct positioning of all parts of the Works.</p>
4.8 Safety Procedure	<p>Amend paragraph (d) as follows:</p> <p>Provide fencing, lighting, guarding and watching of the Works until the issue of the Contract Completion Certificate, provided that such actions do not in any way obstruct the legitimate activities of any authority or of the public.</p> <p>Add a new paragraph at the end of Clause.</p> <p>The Contractor shall use explosives only when the nature of the work to be done so requires them. In such case, in addition to complying with the legal requirements attending to the purchase, transport, storage and handling of explosives, the Contractor shall, when engaged on blasting operations:</p> <ul style="list-style-type: none"> (i) adopt an appropriate warning system to the satisfaction of the Employer's Representative ; and (ii) maintain full liaison with and inform well in advance and obtain such permission as is required from all Government authorities, public bodies and private parties whatsoever concerned or affected by the blasting operations, and (iii) take all reasonable steps to prevent damage to adjacent properties. <p>The Contractor shall pay all licence fees and charges of whatsoever kind relating to the use of explosives</p> <p>At the end of subparagraph (e), add:</p> <p>(f) Comply with all reasonable safety requirements as communicated by the Employer's Representative. However, this will not absolve the Contractor from the responsibility of adopting and maintaining adequate safety measures.</p>
4.10 Site Data	<p>Insert at the end of Sub-Clause 4.10:</p> <p>The data referred to herein shall deemed to include data open for inspection at the office of the Employer's Representative.</p>
4.12 Unforeseeable Physical Conditions	<p>Insert at the end of Sub-Clause 4.12:</p> <p>In additions to notice of any unforeseeable physical conditions, the Contractor shall provide the Employer's Representative with a written notice of any unanticipated environmental or resettlement risks or impacts that arise during the construction, implementation or operation of the Works, which were not considered in the Initial Environmental Examination and/or the Environmental Impact Assessment, and the Environmental Management Plan prepared for the Works.</p>
4.14 Avoidance of Interference	<p>Insert following additional paragraphs at the end of Sub-Clause 4.14:</p> <p>The Contractor shall acquaint himself with the locations of all existing services</p>

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	<p>including drains, telephone and electricity lines and poles, water mains, irrigation ditches and the like, in the vicinity, before any excavation or other work (which are likely to affect the existing services) is commenced. The Contractor shall relocate any utilities which obstruct their work in accordance with the relevant authority.</p> <p>In the case of any accidental damages being caused to existing utilities due to his operations, he shall promptly bring it to the notice of the Employer's Representative and to the relevant utility service organization.</p> <p>The Contractor will be held liable for all damage (including consequential damage) to the road, irrigation structures, ditches, water mains, and electric or telecommunication cables, lines or ducts of any kind caused by him or his Subcontractors in the execution of the Works. The Contractor shall make good any damage without delay and, if necessary, carry out any further work ordered by the Employer's Representative. The Contractor shall also ensure that his Third Party Insurance Cover shall include provisions to fully settle any Claims which may be made by the utility service organizations, consequent to such damages.</p> <p>When operations on the public roads necessitate diversion, obstruction or closure of any road, or any other right of way, the written approval of the Employer's Representative and relevant authorities shall be obtained in advance by the Contractor.</p> <p>The method of working on public roads shall be in compliance with the Specifications and in accordance with procedures approved by the Employer's Representative, and complying with stipulations of the relevant road authority and / or Local Authority, and security forces.</p> <p>The Contractor shall not deposit any equipment on material in any waterway adjacent to the Works. Where temporary works obstruct any waterway, the Contractor shall be responsible for obtaining any approvals from the relevant authorities for such purpose and for rectifying any damages caused by consequential flooding and shall remove all temporary works to the satisfaction of the Employer's Representative on completion of his operations.</p>
<p>4.16 Transport of Goods</p>	<p>Insert at the end of Sub-Clause 4.16:</p> <p>If it is found necessary for the Contractor to move loads of heavy constructional equipment and machinery, materials or prefabricated units or parts of units of work over roads, highways, bridges, waterways and sea, on which area such oversized and overweight items are not normally allowed to be moved for safety considerations, the Contractor shall obtain prior permission from the Employer's Representative and the relevant Authorities.</p> <p>Payments to be made to relevant Authorities for complying with their requirements, if any, for protection of or strengthening of the roads, highways or bridges shall be made by the Contractor and such costs shall be deemed to be included in his Contract Price.</p>
<p>4.18 Protection of the Environment</p>	<p>Insert at the end of Sub-Clause 4.18:</p> <p>The Contractor shall:</p> <p>(a) Comply with the measures and requirements relevant to the contractor set forth in the Initial Environmental Examination (IEE) and/or the Environmental Impact Assessment (EIA) and the Environmental Management Plan (EMP) set out in Section 6, Employer's Requirement, and any corrective or</p>

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	<p>preventative actions set out in a Safeguards Monitoring Report;</p> <p>(b) Make available a budget for all such environmental and social measures;</p> <p>(c) Provide the Employer's Representative with a written notice of any unanticipated environmental or social risks or impacts that arise during construction, implementation or operation of the contract that were not considered in the IEE and/or EIA and the EMP set out in Section 6, Employer's Requirement;</p> <p>(d) Adequately record the condition of roads, agricultural land and other infrastructure prior to start the construction and transporting materials, goods and equipment; and</p> <p>(e) Fully reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.</p>
4.21 Progress Reports	<p>Insert the following after Sub Clause (h):</p> <p>(i) Monitoring of the obligations in Sub-Clauses 4.18, 6.4, 6.7, 6.12, and 6.13.</p> <p>These reports shall be taken up for discussion at the Management Meetings specified under Sub-Clause 3.6.</p>
4.23 Contractor's Operations on Site	<p>Insert at the end of Sub-Clause 4.23:</p> <p>If the Contractor fails to attend to any of the above requirements within 28 days of the issue of the Commissioning Certificate, then the Employer may dispose of same and/or take any appropriate measures by other means and shall after deducting from the proceeds the costs, charges and expenses of and in connection with such disposal and pay the balance, if any, to the Contractor.</p> <p>The Contractor shall not sell or otherwise dispose of or remove, except for the purpose of the Works, any sand, stone, clay, ballast, rock or other substances or materials which he obtains from any excavation made for the purpose of the Works or any buildings or produce upon the Site during the time he is in the possession of the Site, and all such substance, materials, buildings and produce shall be the property of the Employer or the relevant Government Authority, provided that the Contractor may with the permission in writing of the Employer's Representative use any of the same for the purposes of the Works or dispose of them off the Site at approved locations.</p>
4.26 Demolition of existing structures	<p>Add new Sub Clause:</p> <p>The Contractor shall not demolish nor modify the existing permanent structures on the Site except to the extent permitted in the Employer's Requirements or otherwise approved in advance in writing by the Employer's Representative.</p>
5	Design
5.1 General Design Obligations	<p>Insert at the end of Sub-Clause 5.1:</p> <p>The site measurements and other data furnished by the Employer and drawings are approximate and provided for the information of Contractor to make his own interpretations. The Employer does not take any responsibility for its accuracy and correctness of the data at Site. Contractor is therefore, advised to carry out his own checks and satisfy himself about adequacy and accuracy of the same before using such data.</p>
5.2	Delete sub-paragraphs (a) (ii), (b), (c) and (d) in Sub-Clause 5.2 and substitute

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<p>Contractor's Documents</p>	<p>with the following sub-paragraphs:</p> <p>(b) Following the Employer's Representative's approval of the Contractor's Documents, the Contractor shall obtain all regulatory approvals required in respect of the Contractor's Documents in accordance with the Applicable Laws. Execution of the Works shall not commence prior to the receipt by the Contractor of all regulatory approvals in respect of the Contractor's Documents in accordance with the Applicable Laws;</p> <p>(c) Execution of the Works shall be in accordance with the Contractor's Document as approved by the Employer's Representative and the local authorities in accordance with the Applicable Laws;</p> <p>(d) If the Contractor wishes to modify any design or document which has been previously approved by the Employer's Representative and / or the local authorities in accordance with the Applicable Laws, the Contractor shall immediately give notice to the Employer's Representative. Thereafter, the Contractor shall submit revised documents to the Employer's Representative in accordance with the above procedure and, following the Employer's Representative's approval, the Contractor shall ensure the modification receives all regulatory approvals in accordance with the Applicable Laws.</p> <p>Delete the last sentence in Sub-Clause 5.2 and substitute:</p> <p>Any approval or consent, or any review (under this Sub-Clause or otherwise) shall not relieve the Contractor from any obligation or responsibility in accordance with Applicable Laws.</p>
<p>6</p>	<p>Staff and Labor</p>
<p>6.1 Engagement of Staff and Labor</p>	<p>Insert at the end of Sub-Clause 6.1:</p> <p>The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labor with appropriate qualifications and experience from sources within the Country.</p>
<p>6.2 Rates of Wages and Conditions of Labor</p>	<p>Insert at the end of Sub-Clause 6.2:</p> <p>The Contractor shall inform the Contractor's Personnel about their liability to pay personal income taxes in the Country in respect of such of their salaries, wages, allowances and any benefits as are subject to tax under the Laws of the Country for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws. The Contractor shall also comply with core labor standards and labor laws and adopt non discriminatory labor policies that promote equal pay for equal work.</p>
<p>6.7 Health and Safety</p>	<p>Insert at the end of Sub-Clause 6.7:</p> <p>In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government or the local medical or sanitary authorities, for the purpose of dealing and overcoming the same.</p> <p>HIV-AIDS Prevention. The Contractor shall conduct an HIV-AIDS awareness programme via an approved service provider, and shall undertake such other measures as are specified in this Contract to reduce the risk of the transfer of the HIV virus between and among the Contractor's Personnel and the local community, to promote early diagnosis and to assist affected individuals.</p> <p>The Contractor shall throughout the contract : (i) conduct Information, Education and Communication (IEC) campaigns, at least every other month, addressed to all the Site staff and labor (including all the Contractor's</p>

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	<p>employees, all Subcontractors and any other Contractor's or Employer's personnel employees, and all truck drivers and crew making deliveries to Site for construction activities) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behavior with respect to, of Sexually Transmitted Diseases (STD) – or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular; (ii) provide male or female condoms for all Site staff and labor as appropriate; and (iii) provide for STI and HIV/AIDS screening, diagnosis, counseling and referral to a dedicated national STI and HIV/AIDS programme, (unless otherwise agreed) of all Site staff and labor.</p> <p>The Contractor shall include in the programme to be submitted for the execution of the Works an alleviation programme for Site staff and labor and their families in respect of Sexually Transmitted Infections (STI) and Sexually Transmitted Diseases (SBD) including HIV/AIDS. The STI, SBD and HIV/AIDS alleviation programme shall indicate when, how and at what cost the Contractor plans to satisfy the requirements of this Sub-Clause and the related specification. For each component, the programme shall detail the resources to be provided or utilized and any related sub-contracting proposed. The programme shall also include provision of a detailed cost estimate with supporting documentation.</p> <p>Payment to the Contractor for preparation and implementation this programme shall not exceed the Provisional Sum dedicated for this purpose.</p>
6.8 Contractor's Superintendence	<p>Insert at the end of Sub-Clause 6.8:</p> <p>A reasonable proportion of the Contractor's superintending staff shall have working knowledge of the language for communications defined in Sub-Clause 1.4 or the Contractor shall have a number of competent interpreters available on Site during all working hours as may be deemed sufficient by the Employer's Representative.</p> <p>The Employer's Representative may require the Contractor's Representative to be replaced under Sub-Clause 6.9, if her/his knowledge of the English language is found to be insufficient by the Employer's Representative.</p>
6.12 Foreign Personnel	<p>Insert new Sub-clause:</p> <p>The Contractor shall comply with all Sri Lanka government regulations with regard to obtaining permits to employ any foreign personnel required for the execution of the Contract, and shall bear all expenses connected with such compliance.</p> <p>The Contractor may bring in to the Country any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor shall ensure that these personnel are provided with the required residence visas and work permits. The Employer will, if requested by the Contractor, use his best endeavors in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national or government permission required for bringing in the Contractor's personnel.</p> <p>The Contractor shall be responsible for the return of these personnel to the place where they were recruited or to their domicile. In the event of the death in the Country of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial.</p>
6.13 Supply of Foodstuffs	<p>Insert new Sub-clause:</p> <p>The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Employer's Requirements at reasonable prices for</p>

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	the Contractor's Personnel for the purposes of or in connection with the Contract.
6.14 Supply of Water	Insert new Sub-clause: The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.
6.15 Measures against Insect and Pest Nuisance	Insert new Sub-clause: The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce the danger to their health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.
6.16 Alcoholic Liquor or Drugs	Insert new Sub-clause: The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift, barter or disposal thereof by Contractor's Personnel.
6.17 Arms and Ammunition	Insert new Sub-clause: The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.
6.18 Festivals and Religious Customs	Insert new Sub-clause: The Contractor shall respect the Country's recognized festivals, days of rest and religious or other customs.
6.19 Funeral Arrangements	Insert new Sub-clause: The Contractor shall be responsible, to the extent required by local regulations, for making any funeral arrangements for any of his local employees who may die while engaged upon the Works.
6.20 Forced Labor	Insert new Sub-clause: The Contractor shall not employ forced labor, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labor, such as involuntary prison labor, indentured labor, bonded labor or similar labor contracting arrangements.
6.21 Child Labor	Insert new Sub-clause: The Contractor shall not employ any child to perform any work, including work that is economically exploitative, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. "Child" means a child below the statutory minimum age specified under applicable national laws. The contractor shall put in place a procedure to verify the ages of young workers. The Contractor shall not employ any child to perform work below the age of 14 years and for hazardous work below the age of 18 years.
6.22 Employment Records of Workers	Insert new Sub-clause: The Contractor shall keep complete and accurate records of the employment of labor at the Site. The records shall include the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis and submitted to the Employer's Representative, and these records shall be available for inspection by the Bank's auditors during normal working hours. These records shall be made available to the Employer and the Bank's auditors upon request.

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6.23 Workers' Organization	<p>Insert new Sub-clause:</p> <p>In countries where the relevant labor laws recognize workers' rights to form and to join workers' organizations of their choosing without interference and to bargain collectively, the Contractor shall comply with such laws. Where the relevant labor laws substantially restrict workers' organizations, the Contractor shall enable alternative means for the Contractor's Personnel to express their grievances and protect their rights regarding working conditions and terms of employment. In either case described above, and where the relevant labor laws are silent, the Contractor shall not discourage the Contractor's Personnel from forming or joining workers' organizations of their choosing or from bargaining collectively, and shall not discriminate or retaliate against the Contractor's Personnel who participate, or seek to participate, in such organizations and bargain collectively. The Contractor shall engage with such workers' representatives. Workers' organizations are expected to fairly represent the workers in the workforce.</p>
6.24 Non-Discrimination and Equal Opportunity	<p>Insert new Sub-clause:</p> <p>The Contractor shall not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base the employment relationship on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. In countries where the relevant labor laws provide for non-discrimination in employment, the Contractor shall comply with such laws. When the relevant labor laws are silent on nondiscrimination in employment, the Contractor shall meet this Sub-Clause's requirements. Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination.</p>
6.25 Compliance with ADB's Safeguards Policy Statement	<p>Insert new Sub-clause:</p> <p>The Contractor shall comply with:</p> <ul style="list-style-type: none"> (i) the measures and requirements set forth in any environmental management and mitigation plan and/or resettlement plan that may be prepared to the extent it concerns impacts on affected people during construction; and (ii) any corrective or preventive actions set out in safeguards monitoring reports that the Employer will prepare from time to time. <p>The Contractor shall allocate a budget for compliance with these measures, requirements and actions.</p>
7	Plant, Materials and Workmanship
7.1 Manner of Execution	<p>Insert additional paragraphs at the end of Sub-Clause 7.1:</p> <p>Unless otherwise stated elsewhere in the contract, at least 14 days in advance of his programmed commencement of each principal item of work; the Contractor shall furnish for the Employer's Representative's concurrence, the method of working he intends to adopt for execution of such item giving full details of the method of working, equipment to be deployed and measures to be adopted for ensuring the quality of construction and the safety of his workers as well as third parties.</p> <p>He shall also inform the Employer's Representative as a good practice, at least 24 hours in advance of its intended commencement of any work / operation</p>

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	requiring Employer's Representative's inspection and/or approval by forwarding the relevant details, including the resources intended to be deployed - preferably on an agreed format.
7.3 Inspection	Insert at the end of Sub-Clause 7.3: The details for Inspection are mentioned in Section 6 ERQ – Chapter 3 – 3.4.3
8	Commencement, Delays and Suspension
8.2 Time for Completion	Insert at the end of Sub-Clause 8.2: If the Contract provides for a separate Time for Completion of the Contractor's Documents, the Contractor shall be deemed to have completed the preparation of the Contractor's Documents after the receipt of the Employer's Representative notice approval of the Contractor's Documents in accordance with Sub-Clause 5.2.
10	Operation Service
10.2 Commencement of Operation Service	At the end of Sub-Clause 10.2, add: Notwithstanding the issue of the Commissioning Certificate, the Operation Service shall not commence until the Contractor receives a written instruction to commence from the Employer's Representative. Such instruction shall be issued within 28 days of the date of issue of the Commissioning Certificate.
10.6 Delays and Interruptions during the Operations Service	Add the following at the end of Sub-Clause 10.6 (a): If an interruption or delay in the Operation Service results in a breach of the standards specified in the Schedule of Guarantees, then the provisions of Sub Clause 10.7 will apply. This Sub Clause shall include any applicable performance damages as specified in the Appendix 7 (Functional Guarantee) to the Contract Agreement.
10.7 Failure to Reach Production Outputs	This Sub Clause shall include any applicable performance damages as specified in the Appendix 7 (Functional Guarantee) to the Contract Agreement.
13	Variations and Adjustments
13.5 Provisional Sums	Amend the first sentence as follows: Each Provisional Sum shall only be used, in whole or in part, or not at all, in accordance with the Employer's Representative's instructions and the Contract Price shall be adjusted accordingly.
14	Contract Price and Payment
14.1 The Contract Price	Add the following after Sub Clause 14.1: Price Schedule 1 and 6 The Employer will pay all customs duties and other taxes, which includes VAT levied by the Sri Lanka Customs on importing Items in Price Schedule 1 and 6. However the Contractor shall initially pay such duties and taxes for speedy clearance from the port of importation, which shall then be reimbursed by the Employer on submission of original customs clearance documents/receipts. Price Schedules 2, 3, 4 and 5 Except as provided for Contractor's Equipment below, there is no provision for the Employer to provide VAT relief in respect of Price Schedules 2,3,4 and 5. The Contractor shall add VAT to its applications for payment and the Employer

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	<p>would pay the taxes including VAT. The Contractor shall pay VAT to government in accordance with normal Sri Lankan tax practice.</p> <p>At the end of Sub-Clause 14.1, add:</p> <p>Notwithstanding the provisions above, any Contractor's Equipment (including associated spare parts) that is imported by the Contractor for the sole purpose of executing the Contract and that is to be re-exported at the end of the Contract, would be exempted from payment of import duties and taxes upon initial importation, provided that the Contractor shall follow the Carnet procedure as laid down by the Sri Lankan Customs as applicable from time to time.</p> <p>The Contract Price shall include all taxes, duties and other charges imposed outside the Employer's country 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 performance under the Contract.</p> <p>Nothing in the Contract shall relieve the Contractor from its responsibility to pay any tax that may be levied in the Employer's country on profits made by it in respect of the Contract.</p> <p>All employees of the Contractor and the Subcontractors, whether local or foreign, are liable for personal taxation on their emoluments and any other benefits to be derived, in accordance with the laws and regulations being in force in Sri Lanka. In this regard the Contractor is further required to comply with the directives of the Department of Inland Revenue, where applicable.</p>
<p>14.2 Advance Payment</p>	<p>Delete the wordings "or in another form acceptable to the Employer" in third / fourth line of the first para.</p> <p>Delete the last sentence of the third paragraph of Sub-Clause 14.2 and substitute:</p> <p>The advance payment guarantee shall be in the form of an unconditional "On Demand" bank guarantee in the format given in Section 9 of the Bidding Document and in proportions in which the Contract Price is payable, issued by a reputable commercial bank registered and operating in Sri Lanka or in other eligible country, and en-cashable at a reputable commercial bank in Sri Lanka.</p> <p>If the guarantee is to be issued by a bank outside Sri Lanka, it shall be from a bank that has a correspondent bank in Sri Lanka to make it enforceable and en-cashable.</p> <p>Banks in Sri Lanka issuing the bank guarantee or as corresponding bank to a foreign bank shall be one registered and supervised by the Central Bank of Sri Lanka.</p> <p>Delete sub clause 14.2 (a) Deduction shall commence from the first payment</p>
<p>14.7 Issue of Interim Payment Certificate</p>	<p>Add the following sentence at the end of subparagraph (b):</p> <p>The amount to be withheld for such non-compliance shall be as determined by the Employer's Representative.</p>
<p>14.10 Payment of Retention Money</p>	<p>Insert at the end of Sub-Clause 14.10:</p> <p>When the Commissioning Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment by the Employer's Representative, the Contractor shall be entitled to substitute a guarantee in a form approved by the Employer and provided by an entity</p>

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	<p>approved by the Employer and issued by a reputable bank selected by the Contractor, for the second half of the Retention Money. The Contractor shall ensure that the guarantee is in the amounts and currencies of the second half of the Retention Money and is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects, as specified for the Performance Security in Sub-Clause 4.2.</p> <p>On receipt by the Employer of the required guarantee, the Employer's Representative shall certify and the Employer shall pay the second half of the Retention Money. The release of the second half of the Retention Money against a guarantee shall then be in lieu of the release under the second paragraph of this Sub-Clause. The Employer shall return the guarantee to the Contractor within 21 days after receiving a copy of the Final Payment Certificate for the Design-Build Period.</p>
15	Termination by Employer
<p>15.8 Corrupt and Fraudulent Practices</p>	<p>Insert additional Sub-Clause 15.8:</p> <p>If the Employer determines, based on reasonable evidence, that the Contractor has engaged in prohibited practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contract and expel him from the Site, and the provisions of Clause 15 shall apply as if such termination had been made under Sub-Clause 15.2.</p> <p>Should any employee or subcontractor of the Contractor be determined, based on reasonable evidence, to have engaged in a prohibited practice during the execution of the work then that employee shall be removed in accordance with Sub-Clause 6.9 [Contractor's Personnel].</p> <p>ADB's Anticorruption Policy requires Borrowers (including beneficiaries of ADB-financed activity), as well as Bidders, Suppliers, and Contractors, Subcontractors, manufacturers, and Consultants under ADB-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, ADB</p> <p>(a) defines, for the purposes of this provision, the terms set forth below as follows:</p> <ul style="list-style-type: none"> (i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party; (ii) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation; (iii) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party; (iv) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party; (v) "obstructive practice" means (a) deliberately destroying, falsifying, altering, or concealing of evidence material to an ADB investigation; (b) making false statements to investigators in order to materially impede an ADB investigation; (c) failing to comply with requests to provide information, documents or records in connection with an Office of Anticorruption and Integrity (OAI) investigation; (d) threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or (e) materially impeding

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	<p>ADB's contractual rights of audit or access to information; and</p> <p>(vi) "integrity violation" is any act which violates ADB's Anticorruption Policy, including (i) to (v) above and the following: abuse, conflict of interest, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB's Anticorruption Policy, including failure to adhere to the highest ethical standard.</p> <p>(b) will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;</p> <p>(c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the borrower or of a beneficiary of ADB-financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the borrower having taken timely and appropriate action satisfactory to ADB to remedy the situation; and</p> <p>(d) will impose remedial actions on a firm or an individual, at any time, in accordance with ADB's Anticorruption Policy and Integrity Principles and Guidelines (both as amended from time to time), including declaring ineligible, either indefinitely or for a stated period of time, to participate in ADB-financed, administered, or supported activities or to benefit from an ADB-financed, administered, or supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations.</p>
16	Suspension and Termination by Contractor
19	Insurances
19.1 General Requirements	<p>Insert at the end of Sub-Clause 19.1:</p> <p>The Contractor shall be entitled to place all insurance relating to the Contract with insurers from any eligible source country listed in Section 5.</p>
20	Claims, Disputes and Arbitration
20.7 Amicable Settlement	<p>Delete Sub-Clause 20.7 and substitute:</p> <p>Where a Notice of Dissatisfaction has been given under Sub-Clause 20.6 above, both Parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both Parties agree otherwise, the Party giving a Notice of Dissatisfaction in accordance with Sub-Clause 20.6 above shall commence arbitration after the fifty-sixth day from the day on which a Notice of Dissatisfaction was given, even if no attempt at an amicable settlement has been made.</p>
20.8 Arbitration	<p>Delete Sub-Clause 20.8 and substitute:</p> <p>Any dispute between the Parties arising out of or in connection with the Contract not settled amicably in accordance with Sub-Clause 20.7 above and in respect of which the DAB's decision (if any) has not become final and binding shall be finally settled by arbitration. Arbitration shall be conducted as follows:</p> <p>a) if the Contract is with foreign contractors, international arbitration (i) with proceedings administered by the arbitration institution designated in the</p>

Sub Clause	Provisions
	<p>Contract Data, and conducted under the rules of arbitration of such institution; or, if so specified in the Contract Data, (ii) international arbitration in accordance with the arbitration rules of the United Nations Commission on International Trade Law (UNCITRAL); or (iii) if neither an arbitration institution nor UNCITRAL arbitration rules be specified in the Contract Data, with proceedings administered by the Singapore International Arbitration Council (SIAC) and conducted under the SIAC Rules of Arbitration; by one or more arbitrators appointed in accordance with said arbitration rules.</p> <p>The place of arbitration shall be the neutral location specified in the Contract Data, and the arbitration shall be conducted in the language for communications defined in Sub-Clause 1.4 [Law and Language].</p> <p>b) if the Contract is with domestic contractors, arbitration with proceedings conducted in accordance with the laws of the Employer's country.</p> <p>The arbitrators shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Employer's Representative, and any decision of the DAB, relevant to the dispute. Nothing shall disqualify representatives of the Parties and the Employer's Representative from being called as a witness and giving evidence before the arbitrators on any matter whatsoever relevant to the dispute.</p> <p>Neither Party shall be limited in the proceedings before the arbitrators to the evidence or arguments previously put before the DAB to obtain its decision, or to the reasons for dissatisfaction given in its Notice of Dissatisfaction. Any decision of the DAB shall be admissible in evidence in the arbitration.</p> <p>Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, the Employer's Representative and the DAB shall not be altered by reason of any arbitration being conducted during the progress of the Works.</p>
<p>20.10 Disputes Arising during the Operation Service Period</p>	<p>Replace the entire sub-clause 20.10 with the following:</p> <p>Disputes arising during the Operation Service Period which cannot be resolved between the Parties shall be settled by a one person ad-hoc DAB ("Operation Service DAB"). Such person shall be jointly agreed and appointed by the Parties by the date 28 days after one Party has given Notice to the other Party of its intention to refer a Dispute to a DAB in accordance with Sub-Clause 20.10 [Disputes Arising during the Operation Service Period].</p> <p>If the Parties cannot agree on the person who shall be the Operation Service DAB, then the person shall be appointed according to the provisions of Sub-Clause 20.4 [Failure to Agree Dispute Adjudication Board].</p> <p>The agreement between the Parties and the Operation Service DAB shall incorporate by reference the General Conditions of Dispute Adjudication Agreement contained in the General Conditions of Contract, with such amendments as are agreed between them.</p> <p>The terms of remuneration of the Operation Service DAB shall be mutually agreed upon by the Parties when agreeing the terms of appointment. Each Party shall be responsible for paying one-half of this remuneration.</p> <p>The procedure for obtaining a decision from the Operation Service DAB shall be in accordance with the provisions of Sub- Clause 20.6 [Obtaining Dispute Adjudication Board's Decision], and the DAB shall give its decision no later than 84 days after receiving the response or, if no response is submitted, 105 days</p>

Sub Clause	Provisions
	<p>after receiving the reference and the supporting documentation from the Parties.</p> <p>The appointment of the Operation Service DAB shall expire 28 days after it has given its decision in writing to both Parties.</p> <p>If either Party is dissatisfied with the decision of the Operation Service DAB, the provisions of Sub-Clauses 20.6 [Obtaining Dispute Adjudication Board's Decision], 20.7 [Amicable Settlement], 20.8 [Arbitration] and 20.9 [Failure to Comply with Dispute Adjudication Board's Decision] shall apply.</p>

Section 9 - Contract Forms

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Notification of Award

[Employer's *letterhead*]

Letter of Acceptance

[*date*]

To: [*Name and address of the contractor*]

This is to notify you that your Bid dated [*date*] for execution of the [*name of the contract and identification number, as given in the Bid Data Sheet*] for the design, execution and completion of the Works comprising the above-named Contract and remedying the defects therein so that they are fit for the purposes defined in the Contract, and for the operation and maintenance thereof under license for the period of ____ years for the Accepted Contract Amount of the equivalent of amount in numbers and words and name of currency , as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our Agency."

This amount is made up of the following components:

For the Design-Build of the Works, the amount of:
(*currency and amount in figures*)
(*currency and amount in words*)

For the Operation Service*, the total amount of:
(*currency and amount in figures*)
(*currency and amount in words*)

For the Asset Replacement Fund*, the total amount of:
(*currency and amount in figures*)
(*currency and amount in words*)

You are requested to furnish the Performance Security within 28 days in accordance with the Conditions of Contract, using for that purpose one of the Performance Security Forms included in Section 9 (Contract Forms) of the Bidding Document.

In consideration of you properly and truly performing the Contract, we agree to pay you the Accepted Contract Amount or such other sums to which you may become entitled under the terms of the Contract, at such times and as prescribed by the Contract.

Authorized Signature:

Name and Title of Signatory:

Name of Agency:

Attachment: Contract Agreement

Contract Agreement

THIS AGREEMENT made on the [*insert number*] day of [*insert month*], [*insert year*],

BETWEEN

[*name of employer*], a corporation incorporated under the laws of [*country of employer*] and having its principal place of business at [*address of employer*] (hereinafter called “the Employer”), and

[*name of contractor*], a corporation incorporated under the laws of [*country of contractor*] and having its principal place of business at [*address of contractor*] (hereinafter called “the Contractor”).

WHEREAS the Employer desires that the Works known asshould be executed by the Contractor, and has accepted a Bid by the Contractor for the design, execution, completion and operation and maintenance of these Works and the remedying of any defects therein,
The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
 - (a) This Contract Agreement and the Appendices hereto
 - (b) The Letter of Acceptance dated
 - (c) The Addenda Nos. insert addenda numbers if any. . . .
 - (d) The Particular Conditions of Contract
 - (e) The General Conditions of Contract
 - (f) Letter of Price Bid and Price Schedules submitted by the Contractor
 - (g) The Employer’s Requirements
 - (h) The Schedules and other completed Bidding Forms submitted with the Letters of Technical and Price Bids
 - (i) List of eligible countries that was specified in section 5 of the bidding document
 - (j) The Operating Licence, and
 - (k) The Contractor’s Proposal
3. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Employer to design, execute, complete, operate and maintain the Works and remedy any defects therein in conformity with the provisions of the Contract and the Operating License granted by the Employer.
4. The Employer hereby covenants to pay the Contractor in consideration of the design, execution, completion and operation and maintenance of the Works and the remedying of defects therein, the Contract Price at the times and in the manner prescribed by the Contract, and to grant the Contractor a royalty-free license to enable him to operate and maintain the Works during the Operation Service Period.

In Witness whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of name of the borrowing country on the day, month and year indicated above.

Signed by:
For and on behalf of the Employer in the presence of
.....
Witness, Name, Signature, Address, Date

Signed by:
for and on behalf the Contractor in the presence of
.....
Witness, Name, Signature, Address, Date

APPENDIXES

Appendix 1 - Terms and Procedures of Payment

Appendix 2 - Price Adjustment

Appendix 3 - Time Schedule

Appendix 4 - List of Major Items of Plant and Services and List of Approved Subcontractors

Appendix 5 - Scope of Works and Supply by the Employer

Appendix 6 - List of Documents for Approval or Review

Appendix 7 - Functional Guarantees

Appendix 1 - Terms and Procedures of Payment

(A) Terms of Payment

The Terms of Payment to be followed and in applying for certification and making payments shall be as follows, subject to other terms in the Conditions of Contract:

Schedule No. 1 - Plant and Mandatory Spare Parts Supplied from Abroad

CIP Thalaiyadi INCOTERMS 2010 for all items for the Intake & Sea outfall System and Treatment plant and Treated Water Transmission Main from Thalaiyadi to Puthukadu Junction.

In respect of plant and equipment supplied from abroad, the following payments shall be made by the Employer:

Ten percent (20%) of the total CIP amount as an advance payment after submission of the Design Report, against receipt of invoice and an irrevocable advance payment security for the equivalent amount made out in favour of the Employer.

Forty percent (40%) of the total or pro rata CIP amount after receipt of invoice and shipping documents. In the event that shipping is delayed upon the written instruction of the Employer for more than twenty-eight (28) days beyond the date shown in the Program of Performance provided in accordance with GCC Sub-Clause 8.3, the Contractor may make application for this part of the payment against warehouse receipts, provided always that the plant and equipment were ready for shipment on the date shown in the said Program.

Up to Seventy percent (80%) of the total or pro rata CIP amount less previous payments made in respect of Schedule 1, upon delivery at site and inspection and satisfied by the Employer.

Up to Hundred percent (100%) of the total CIP amount less previous payments made in respect of Schedule 1, upon issue of the Commissioning Certificate and receipt of invoice.

All payments (excluding advance payment) shall be made accordance with the GCC Sub Clause 14.3.

Schedule No. 2 - Plant and Mandatory Spare Parts Supplied from within the Employer's country

In respect of plant and equipment supplied from within the Employer's country, the following payments shall be made by the Employer:

Ten percent (20%) of the total or pro-rata EXW amount as an advance payment after submission of the Design Report, and against receipt of invoice and an irrevocable advance payment security for the equivalent amount made out in favour of the Employer.

Seventy percent (60%) of the total or pro rata EXW amount, upon delivery at site and inspection and satisfied by the Employer.

Up to Hundred percent (100%) of the total EXW amount, less previous payments made in respect of Schedule 2, upon issue of the Commissioning Certificate and after receipt of invoice.

All payments (excluding advance payment) shall be made accordance with the GCC Sub Clause 14.3.

Schedule No. 3 - Design Services

In respect of design services for both the foreign currency and the local currency portions, the following payments shall be made by the Employer:

Ten percent (10%) of the total design services amount as an advance payment against receipt of invoice and an irrevocable advance payment security for the equivalent amount made out in favour of the Employer.

Forty five percent (45%) of the total design services amount upon completion, as described under “Section 6 Employers Requirement – 3.2.1 Design Review Deliverables – (b)”, and after receipt of invoice certified by the Employer’s Representative.

Sixty percent (60%) of the total design services amount less previous payments made in respect of Schedule 3, upon completion, as described under “Section 6 Employers Requirement – 3.2.1 Design Review Deliverables – (c)”, and after receipt of invoice certified by the Employer’s Representative.

Seventy five percent (75%) of the total design services amount less previous payments made in respect of Schedule 3, upon completion as described under “Section 6 Employers Requirement – 3.2.1 Design Review Deliverables – (d)”, and after receipt of invoice certified by the Employer’s Representative.

Ninety percent (90%) of the total design services amount at pro rata based on measured/assessed value of work less previous payments made in respect of Schedule 3, upon completion as described under “Section 6 Employers Requirement – 3.2.1 Design Review Deliverables – (e)”, and after receipt of invoice certified by the Employer’s Representative.

Up to Hundred percent (100%) of the total design services amount less previous payments made in respect of Schedule 3, upon completion as described under “Section 6 Employers Requirement – 3.2.1 Design Review Deliverables – (f)”, and after receipt of invoice certified by the Employer’s Representative.

All payments (excluding advance payment) shall be made accordance with the GCC Sub Clause 14.3.

Schedule No. 4 - Build Services

In respect of Build Services for both the foreign and local currency portions, the following payments shall be made:

Ten percent (20%) of the total Build Services amount excluding Provisional Sums as an advance payment after submission of the Design Report, against receipt of invoice and an irrevocable advance payment security for the equivalent amount made out in favour of the Employer.

Seventy percent (70%) of the total amount at pro rata based on measured/assessed value of work performed by the Contractor during the preceding month, as evidenced by the Employer’s Representative’s authorization of the Contractor’s application, will be made monthly, after receipt of invoice.

Up to Hundred percent (100%) of the total value of Build Services performed by the Contractor as evidenced by the Employer’s Representative’s authorization of the Contractor’s final application for design build period, less previous payments made in respect of Schedule 4, upon issue of the Commissioning Certificate.

All payments (excluding advance payment) shall be made accordance with the GCC Sub Clause 14.3.

Schedule No. 5 – Operation Services

No Advance payment would be made in respect of Operation Services.

The price specified in the price schedule shall be released subject to deduction/adjustment of prices accordance with GCC Sub Clauses 10.6, 10.7, 14.13, 14.14, 14.15 and 14.19.

Schedule No. 6 – Asset Replacement Fund and Schedule

No Advance payment would be made in respect of Asset Replacement Fund and Schedule.

Up to Hundred percent (100%) of the total value of Asset Replacement Fund and Schedule performed by the Contractor as evidenced by the Employer's Representative's in respect of Schedule 6 and accordance with the GCC Sub Clause 14.18 and 14.19.

Summary of Schedules and Payment Terms

The "Terms of Payment" shall summarised as below;

Table 9-1: Summary of Payment Schedule

No.	Schedule	1 st - Advance	2nd	3rd	4th	5th	6th
1	Schedule No. 1: Plant and Equipment Supplied from Abroad	20%	40%	80%	100%		
2	Schedule No. 2: Plant and Equipment Supplied from within the Employer's Country	20%	60%	100%			
3	Schedule No. 3: Design Services	10%	45%	60%	75%	90%	100%
4	Schedule No. 4 Build Service	20%	70%	100%			
5	Schedule No 5: Operation Service	-	100%				
6	Schedule No. 6: Asset Replacement Fund	-	100%				

(B) Payment Procedures

The procedures to be followed and in applying for certification and making payments shall be as follows, subject to other terms in the Conditions of Contract:

Schedule No. 1 - Plant and Mandatory Spare Parts Supplied from Abroad

The Contractor shall submit an invoice for payments when so due, with a statement in one original and five copies to the Employer's Representative, showing in detail the amounts to which the Contractor considers himself to be entitled as per Terms of Payment given above, or under any other Conditions of Contract, together with supporting documents.

Prior to shipment

Tests and Inspections to confirm the technical specifications specified in Section 6 - Employer's Requirements, and as provided for in the Contract, shall be carried out at the following times or milestones, and places:

(a) The Contractor shall be responsible to conduct pre-shipment inspections and tests, as may be necessary and as provided for in the Contract, to ensure that the items of Plant have been fabricated/manufactured and assembled as per the best international practices, in accordance with the specifications, and that they satisfactorily perform the functions for which they are intended. The Contractor shall furnish an inspection and testing certificate to the Employer certifying that such inspections and tests have been satisfactorily conducted prior to shipment.

(b) An independent inspection authority named in the relevant Price Schedules or as appointed by the Employer and paid for by the Contractor through the Provisional Sums provided in the Contract for this purpose, shall conduct independent tests/ inspections at the factory/warehouse of the manufacturer/Contractor /supplier, prior to shipment of the items forming Plant, which items had been so stipulated in the Employer's Requirements or as decided by the Employer's Representative for such inspection by an independent inspection authority. Such inspection certificate shall be submitted to the Employer for claiming payments under the Terms of Payment given above.

(c) The Employer through authorized representative(s) of the Employer and paid for by the Contractor through the Provisional Sums provided in the Contract for this purpose, may conduct independent tests/ inspections at the factory/warehouse of the Manufacturer/Contractor /supplier, prior to shipment of the items forming Plant, which items had been so stipulated in the Employer's Requirements or as decided by the Employer's Representative. Such inspection certificate shall be submitted to the Employer for claiming payments under the Terms of Payment given above.

Upon shipment

Upon shipment, the Contractor shall notify the Purchaser and the Insurance Company by telex or fax the full details of the shipment, including Contract number, description of items of Plant, quantity, the vessel, the bill of lading number and date, port of loading, date of shipment, port of discharge, etc. The Contractor shall send the following documents to the Employer, with a copy to the Insurance Company:

(a) 3 copies of the Contractor's invoice showing the description of the Goods, quantity, unit price, and total amount;

(b) Original and 2 copies of the negotiable, clean, on-board bill of lading marked "freight prepaid" and 2 copies of non-negotiable bill of lading;

(c) 3 copies of the packing list identifying contents of each package;

- (d) Insurance certificate;
- (e) Manufacturer's factory inspection report;
- (f) Manufacturer's warranty certificate;
- (g) Third party and/or Employer's representative inspection report certifying that the Goods are in conformity to the specifications and terms of Contract, if so stipulated in the Contract.
- (h) Manufacturer's/Supplier's pre-shipment inspection report and certificate certifying that the Goods are conforming in all respects to the specifications and other terms of the Contract; and
- (i) Certificate of origin.

The Contractor must ensure that the Employer receives the above documents at least 10 working days before arrival of the items of Plant at the port or place of arrival and, if not received, the Contractor shall be responsible for any consequential expenses arising from such delay.

Schedule No. 2 - Plant and Mandatory Spare Parts Supplied from within the Employer's country

The Contractor shall submit an invoice for payments when so due, with a statement in one original and five copies to the Employer's Representative, showing in detail the amounts to which the Contractor considers himself to be entitled as per Terms of Payment given above, or under any other Conditions of Contract, together with supporting documents.

The Employer's Representative on receipt of Invoice submitted as above shall certify the amount payable by the Employer as per terms of the Contract, based on the statement submitted by the Contractor, and submit same to the Employer, within twenty one (21) days of receipt of invoice.

The Employer on receipt of the invoice and statement certified by the Employer's Representative shall make payment to the Contractor, the amount so certified.

Schedule No. 3 - Design Services

The Contractor shall submit an Invoice for payments when so due, with a statement in one original and five copies to the Employer's Representative, showing in detail the amounts to which the Contractor considers himself to be entitled as per Terms of Payment given above, or under any other Conditions of Contract, together with supporting documents.

The Employer's Representative on receipt of Invoice submitted as above shall certify the amount payable by the Employer as per terms of the Contract, based on the statement submitted by the Contractor, and submit same to the Employer within twenty one (21) days of receipt of Invoice.

The Employer on receipt of the invoice and statement certified by the Employer's Representative shall make payment to the Contractor, the amount so certified, after receipt by the Employer.

Schedule No. 4 - Build Services

The Contractor shall submit an invoice for payments when so due, with a statement in one original and five copies to the Employer's Representative, showing in detail the amounts to which the Contractor considers himself to be entitled as per Terms of Payment given above, or under any other Conditions of Contract, together with supporting documents.

The Employer's Representative on receipt of Invoice submitted as above shall certify within 21 days, the amount payable by the Employer as per terms of the Contract, based on the statement submitted by the Contractor, and submit same to the Employer.

The Employer's Representative shall be entitled to withhold any of the Interim Payment Certificates in total or in part, if the Contractor fails to comply within a reasonable time as determined by the Employer's Representative, with any of the obligations, conditions / requirements of this Contract for which the Employer's Representative has given non-compliance notice to the Contractor in writing. The amount to be withheld for such non-compliance shall be as determined by the Employer's Representative.

The Employer on receipt of the invoice and statement certified by the Employer's Representative shall make payment to the Contractor, the amount so certified, after receipt by the Employer.

Schedule No. 5 – Operation Services

The Contractor shall submit an invoice for payments when so due, with a statement in one original and five copies to the Employer's Representative, showing in detail the amounts to which the Contractor considers himself to be entitled as per Terms of Payment given above, or under any other Conditions of Contract, together with supporting documents.

The Employer's Representative on receipt of Invoice submitted as above shall certify within 21 days, the amount payable by the Employer as per terms of the Contract, based on the statement submitted by the Contractor, and submit same to the Employer.

The Employer's Representative shall be entitled to withhold any of the Interim Payment Certificates in total or in part, if the Contractor fails to comply within a reasonable time as determined by the Employer's Representative, with any of the obligations, conditions / requirements of this Contract for which the Employer's Representative has given non-compliance notice to the Contractor in writing. The amount to be withheld for such non-compliance shall be as determined by the Employer's Representative.

The Employer on receipt of the invoice and statement certified by the Employer's Representative shall make payment to the Contractor, the amount so certified, after receipt by the Employer.

Procedures for Calculation of the Operation Service payments

Payments for the Operation Service comprise the Contractor's Fixed Fee under Price Schedule 5.1, and the Contractor's Variable Rate (CVR) under Price Schedule 5.2 and the Contractor's Electricity Payment in Price Schedule 5.3.

- 1) Schedule 5.1: The Employer shall pay the Contractor's Annual Fixed Fee monthly in arrears in 12 equal monthly instalments.
- 2) Schedule 5.2: The Employer shall pay the Contractors Variable Payment in accordance with the following formula:

$$CVP = CVR \times V_p$$

Where:

CVP is the Contractor's Variable Payment (pre-indexation), and

CVR is the Contractor's Variable Rate in Price Schedule 5.2, and

V_p is the measured volume of production as measured at the high lift tanks in accordance with methodologies and equipment to be agreed with the Employer during the Works design stage.

- 3) Schedule 5.3: The Employer will reimburse the Contractor's SWRO plant electricity costs at cost, less any amounts payable in performance damages for non-achievement of the guaranteed minimum plant efficiency requirement.

Schedule No. 6 – Asset Replacement Fund and Schedule

The Contractor shall submit an invoice for payments when so due, with a statement in one original and five copies to the Employer's Representative, showing in detail the amounts to which the Contractor considers himself to be entitled as per Terms of Payment given above, or under any other Conditions of Contract, together with supporting documents.

The Employer's Representative on receipt of Invoice submitted as above shall certify within 21 days, the amount payable by the Employer as per terms of the Contract, based on the statement submitted by the Contractor, and submit same to the Employer.

The Employer's Representative shall be entitled to withhold any of the Interim Payment Certificates in total or in part, if the Contractor fails to comply within a reasonable time as determined by the Employer's Representative, with any of the obligations, conditions / requirements of this Contract for which the Employer's Representative has given non-compliance notice to the Contractor in writing. The amount to be withheld for such non-compliance shall be as determined by the Employer's Representative.

The Employer on receipt of the invoice and statement certified by the Employer's Representative shall make payment to the Contractor, the amount so certified, after receipt by the Employer.

Appendix 2 - Price Adjustment

Prices payable to the Contractor for the Design-Build of the Works shall not be adjusted for inflation.

Prices payable to the Contractor for the Operation Service and Asset Replacement Fund, in accordance with the Contract, shall be subject to adjustment during performance of the Contract to reflect changes in the cost of labor and material components, in accordance with the following formulas:

1) For Price Schedule 5.1 - Operation Service – Fixed Fee

A. Foreign currencies:

The foreign currency component of the Contractor's Fixed Fees in Schedule 5.1 shall be adjusted to take account of inflation effects in accordance with the following formula:

$$FF_1 = FF_0 \times CPI_1 / CPI_0$$

in which:

$FF_1 =$	Inflation adjusted amount payable to the Contractor
$FF_0 =$	Fixed Fee contract price (base price) specified in the Schedule 5.1
$CPI_0, CPI_1 =$	Consumer price indexes applicable in the country of origin on the base date and the date for adjustment, respectively

B. Local currency:

The local currency component of the Contractor's Fixed Fees in Schedule 5.1 shall be adjusted to take account of inflation effects in accordance with the following formula:

$$FF_1 = FF_0 \times CCPI_1 / CCPI_0$$

in which:

$FF_1 =$	Inflation adjusted amount payable to the Contractor
$FF_0 =$	Fixed Fee contract price (base price) specified in the Schedule 5.1
$CCPI_0, CCPI_1 =$	Colombo Consumer Price Index published by the Government of Sri Lanka Department of Census and Statistics applicable on the base date and date of adjustment respectively.

2) For Price Schedule 5.2 - Operation Service – Contractor's Variable Rate

A. Foreign currencies:

The foreign currency component of the Contractor's Variable Rate in Schedule 5.2 shall be adjusted to take account of inflation effects in accordance with the following formula:

$$CVR_1 = CVR_0 \times MPI_1 / MPI_0$$

in which:

$CVR_1 =$	Inflation adjusted amount payable to the Contractor
$CVR_0 =$	Contractor's Variable Rate (base price) specified in the Schedule 5.2
$MPI_0, MPI_1 =$	Consumer price indexes applicable in the country of origin on the base date and the date for adjustment, respectively

B. Local currency:

The local currency component of the Contractor's Variable Rate in Schedule 5.2 shall be adjusted to take account of inflation effects in accordance with the following formula:

$$CVR_1 = CVR_0 \times MPI_1 / MPI_0$$

in which:

$CVR_1 =$	Inflation adjusted amount payable to the Contractor
$CVR_0 =$	Contractor's Variable Rate (base price) specified in the Schedule 5.2
$MPI_0, MPI_1 =$	Colombo Consumer Price Index published by the Government of Sri Lanka Department of Census and Statistics applicable on the base date and date of adjustment respectively.

3) For Price Schedule 5.3 - Operation Service: Contractor's Electricity Payment

Not applicable. No indexation adjustment shall be made.

4) For Price Schedule 6 – Asset Replacement Fund

A. Foreign currencies:

The foreign currency component of the Asset Replacement Fund payment in Schedule 6 shall be adjusted to take account of inflation effects in accordance with the following formula:

$$AR_1 = AR_0 \times MPI_1 / MPI_0$$

in which:

$CVR_1 =$	Inflation adjusted amount payable to the Contractor
$CVR_0 =$	Contractor's Variable Rate (base price) specified in the Price

Form 5.2

MPI₀, MPI₁ = Material and equipment price indexes applicable in the country of origin on the base date and the date for adjustment, respectively

B. Local currency:

The local currency component of the Asset Replacement Fund payment in Schedule 6 shall be adjusted to take account of inflation effects in accordance with the following formula:

$$AR_1 = AR_0 \times CCPI_1 / CCPI_0$$

in which:

AR₁ = Inflation adjusted amount payable to the Contractor

AR₀ = Asset Replacement bid price (base price) in local currency specified in the Price Form 6

CCPI₀, CCPI₁ = Colombo Consumer Price Index published by the Government of Sri Lanka Department of Census and Statistics applicable on the base date and date of adjustment respectively.

Conditions Applicable to Price Adjustment

- a) The date of adjustment shall be the date 45 days before the last day of the Month to which the Interim Certificate refers.
- b) The base date shall be the date 28 days prior to the Bid closing date.
- c) The names of the foreign currencies to be used, the applicable indices to be used, and the value of the indices as at the base date are as indicated in the Contractor's financial proposal.

Table of Price Indices (from Contractor's Bid)

Item	Name of index	Value at base date

Appendix 3 - Time Schedule

Time for Completion for parts of the Works:

Part 1: Design of whole works up to Issue for Construction (IFC) as specified in Section 6 shall be hundred and eighty days (180) from the Commencement Date.

Part 2: Design – Build Period excluding Operation Service of whole works specified in section 6 shall be nine hundred and ten days (910) from the Commencement Date.

Part 3: Operation Services Period of whole works specified in section 6 shall be two thousand five hundred and fifty five days (2555) starting from the date of commencement of the Operation Service stated in Commissioning Certificate.

Appendix 4 - List of Major Items of Plant and Services and List of Approved Subcontractors

Prior to issuance of Letter of Acceptance, provide here following:

- the list of major items of plant and services; and,
- the list of approved manufacturers or subcontractors for each item concerned

Any subcontractors that are subsequently determined to be unacceptable, pursuant to ITB Sub Clause 35.4, shall not be included in this appendix. If all listed subcontractors relating to an item of plant and services are determined to be unacceptable pursuant to ITB Sub Clause 35.4, the Bid will not be rejected, but the Bidder will be required to substitute at least one acceptable manufacturer or subcontractor without any change to the bid price or the accepted technical specifications. If a Bidder does not provide an acceptable substitute manufacturer or subcontractor by the date and time set in the Employer's request for substitution of manufacturer or subcontractor, its Bid may then be rejected.

In the case the Contractor who offered to supply and install major items of plant under the contract, which they did not manufacture or otherwise produce, the Contractor shall provide the Manufacturer's authorization, using the form provided in Section 4 (Bidding Forms), showing that the Contractor has been duly authorized by the Manufacturer or producer of the related plant and equipment or component to supply and install that item in the Employer's country. Failure to submit the Manufacturer's authorization at the first instance is considered a minor, nonmaterial omission and shall be subject to clarification. However, failure of the Bidder to submit the omitted authorization shall lead to rejection of the Subcontractor or Manufacturer of the item under evaluation in accordance with ITB 35.4.

Appendix 5 - Scope of Works and Supply by the Employer

The following personnel, facilities, works, and supplies will be provided or supplied by the Employer, and the provisions of GCC Clauses 2.2 and 4.2 shall apply as appropriate.

All personnel, facilities, works, and supplies will be provided by the Employer in good time so as not to delay the performance of the Contractor, in accordance with the approved Time Schedule and Program of Performance pursuant to GCC Sub clause 8.3

Available Raw Water Quality Reports, Environmental Study Report which consists of Bathymetric Survey Data, Sub bottom profile data and Effluent Dispersion Model, Topography Survey Maps of SWRO Plant site and proposed trace for Transmission Main, Soil Investigation Reports for SWRO Plant Site and will be provided to the Contractor free of charge.

Unless otherwise indicated, all personnel, facilities, works, and supplies will be provided free of charge to the Contractor.

Personnel	Charge to Contractor (if any)
Nil : during Design & Build Period	
Shall provide during Operation and Maintenance period as specified in the Operation and Maintenance TOR in Section 6 Employer's Requirement,	

Facilities	Charge to Contractor (if any)
Nil	

Works	Charge to Contractor (if any)
Nil	

Supplies	Charge to Contractor (if any)
Nil	

Appendix 6 - List of Documents for Approval or Review

Pursuant to GCC Sub clause 2.2, the Contractor shall prepare, or cause its Subcontractor to prepare, and present to the Employer's Representative in accordance with the requirements of GCC Sub clause 8.3 (Program of Performance), the following documents for;

(A) Approval

1. Final Designs, final layout plans, and drawings subjected to the requirements given in Section 6 – Employer's Requirement
2. All material, electrical and mechanical components used in the Plant requiring Employer's Personnel agreement as required by Section 6 – Employer's Requirement
3. All changes proposed by the Contractors as submitted through Change Order requests
4. Reports of performance tests

The performance tests indicated in the Section 6 under the following categorization shall be reported as specified.

- Pre-Commissioning Trials
- Tests on Completion
- Test after Completion (water quality):
- Test after Completion (water losses, power consumption and chemical consumption)

5. All other documents / materials / equipment requested in Section 6 – Employer's Requirement

(B) Review

1. Reports including data, results and analysis of all investigations, surveys and studies require as per the Section 6 Employer's Requirements to:
 - (a) Obtain the necessary data for design work, and
 - (b) Verify the details and data provided by the Employer.
2. All approvals, consents and permits received from other agencies such as Road Development Authority as specified in Section 6 Employer's Requirement
3. Preliminary design proposals and reports, all conceptual proposals, preliminary proposals and layout plans requiring the Employer's Personnel review and comments as specified in the Section 6 Employer's Requirements
4. All other documents requested in Section 6 – Employer's Requirement

Appendix 7 - Functional Guarantee

1. General

This Appendix sets out

- (a) the functional guarantee referred to in PCC : Part B Special Provisions Sub Clause 10.6 and 10.7.
- (b) the preconditions to the validity of the functional guarantees for facilities.
- (c) the minimum level of the functional guarantees
- (d) the formula for calculating performance damages for failure to attain the functional guarantees.

2. Preconditions

The Contractor gives the functional guarantees (specified herein) for the facilities, subject to the following preconditions being fully satisfied:

3. Functional Guarantees

Subject to compliance with the foregoing preconditions, the Contractor guarantees as follows:

No.	Functional Guarantee <i>[as required in the Specification, e.g., performance, efficiency, consumption, etc.]</i>	Requirements <i>[as required in the Specification]</i>
1	Water Production Quantity	24 MLD Potable Water
2	Water Production Quality	As specified in Table 2 -4 in Section 6:ERQ
3	Energy – SWRO Plant	3.8 kWh/m ³ [or lower amount as proposed by bidder]
4	Energy – Administration Building, Quarters, Circuit Bungalow and internal lighting	[As proposed by bidder]
5	Chemical usage	[As proposed by bidder]
6	Replacement of Ultra Filter (if used)	[As proposed by bidder]
7	Replacement of Cartridge filter	[As proposed by bidder]
8	Replacement of RO membranes	[As proposed by bidder]

4. Failure in Guarantees and Performance Damages

If, during the Operation Service Period, the Contractor fails to meet the standards specified in the Schedule of Guarantees, and the cause of the failure lies with the Contractor, and the failure was not caused by an Exceptional Event as defined in GCC 1.1.37, then the Contractor shall pay to the Employer performance damages in the following amounts.

No.	Item	Amount of performance damage	Evaluation Period	Allowable exclusions
1.	Failure to supply the guaranteed minimum plant output specified in the Schedule of Guarantees, when requested by the Employer.	USD 1.0 per m ³ of shortfall	Monthly	<p>Up to 1.25 days per Month of plant downtime to accommodate planned maintenance activities.</p> <p>Plant downtime caused by interruptions in electricity supply unless the cause of such downtime lies with the Contractor.</p> <p>Amount of shortfall attributable to unplanned interruptions for which damages have been paid separately under item 2 below.</p>
2.	Unplanned interruptions to production > 18 hours	USD 1.0 per m ³ of shortfall	Daily	Plant downtime caused by interruptions in electricity supply unless the cause of such downtime lies with the Contractor.
3.	Non-compliance with Potable Water Quality Requirements specified in Employer's Requirements (Section 6)	<p>50% of the Contractor's Daily Fixed Fee Amount¹ if the product water is accepted by the Employer.</p> <p><i>Where the Contractor's Daily Fixed Fee Amount equals = Contractor's Monthly Fixed Fee following indexation adjustment / 30.4</i></p> <p>100% of all Contractor payments for the</p>	Daily	The employer may accept for 2 hours or less period of time water that meets the health requirements but does not meet the aesthetic requirements. However consistent or regular transgressions of the aesthetic requirements would not be accepted.

No.	Item	Amount of performance damage	Evaluation Period	Allowable exclusions
		Operation Service for each day of non-compliance if the product water is not accepted by the Employer.		
4.	Failure to undertake water quality testing in accordance with the frequencies specified in [Employer's Requirements]	US \$ 5,000 per day of non-compliance with the frequency requirements.	Daily	None
5.	Failure to meet the requirements of the environmental production license and local environmental law as monitored by statutory authorities (including CEA/ MEPA / CCD and NARA).	US \$ 5,000 per day of failure.	Daily	None
6.	Annual average power consumption above the threshold specified in the Schedule of Guarantees – SWRO Plant	Total excess power used (kWh) x average CEB tariff ¹ x 1.5 <i>¹Calculated as total CEB energy charges in the year (LKR) including taxes (if any) / Total power consumed (kWh)</i>	Annually evaluated and Monthly recorded	Raw water parameters outside the range for source water quality specified in Employer's Requirements (Section 6).
7.	Annual average power consumption above the threshold specified in the Schedule of Guarantees – Administration Building, Quarters, Circuit Bungalow and internal lighting	Total excess power used (kWh) x average CEB tariff ¹ x 1.5 <i>¹Calculated as total CEB energy charges in the year (LKR) including taxes (if any) / Total power consumed (kWh)</i>	Annually evaluated and Monthly recorded	None
8.	Chemical usage	No payment for excess usage of chemical as proposed by bidder	Monthly	Raw water parameters outside the range for source water quality specified in Employer's Requirements

No.	Item	Amount of performance damage	Evaluation Period	Allowable exclusions
				(Section 6).
9.	Guaranteed Life of Membrane and Cartridge filters	If the life time is less than the guaranteed value, the contractor not eligible to claim for replacement cost from the Employer.	As required	Raw water parameters outside the range for source water quality specified in Employer's Requirements (Section 6).

Rules for the evaluation and imposition of damages:

1. Where the evaluation period in the above table is shown as “annual” the evaluation shall be based on years of the Operation Service Period, with the first year of evaluation starting on the first day of the Operation Service Period.
2. Where the evaluation period in the above table is shown as “monthly” the evaluation period shall start on the 1st day of the calendar month and shall end on the last day of the calendar month.
3. Where the evaluation period is shown as “daily”, the evaluation shall be based on a 24 hour period from 00.00 a.m to 12.59 p.m.
4. The “period of non-compliance” with water quality standards shall be calculated as follows.
 - a. The 1st day of non-compliance shall be determined as the day in which monitoring systems, inspections or tests, carried out and validated in accordance with the Employer’s Requirements, reveal that the Works is failing to meet the applicable standard in the Schedule of Guarantees.
 - b. The last day of non-compliance shall be determined as the day before the day that the test results demonstrate, to the satisfaction of the Employer’s Representative that the Works has returned to full compliance with the applicable standards in the Schedule of Guarantees.
 - c. The Contractor shall be regarded as having been non-compliant for a full day, notwithstanding that it may have been out of compliance for only part of that day.
5. The performance damages above shall be in addition to any fines that may be imposed on the Contractor by the courts or statutory authorities.

Payment of Performance Damages

Unless otherwise stated, the performance damages herein shall be payable in the proportions and in the currencies of the Operation Service element of the Accepted Contract Amount.

Performance Security (Design-Build)

.....*Bank’s Name, and Address of Issuing Branch or Office*

Beneficiary: *National Water Supply & Drainage Board, Galle Road, Ratmalana, Sri Lanka*

Date:

Performance Guarantee No.:

We have been informed that ***name of the Contractor.*** (hereinafter called "the Contractor") has entered into Contract No. ***reference number of the Contract.*** dated with you, for the execution of ***name of contract and brief description of Works.*** (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Contractor, we ***name of the Bank.*** hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of ***name of the currency and amount in figures****. (***amount in words.***) such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the Day of , **; and any demand for payment under it must be received by us at this office on or before that date.

“The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed one year, in response to the Employer’s written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.”

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded.

.....
Seal of Bank and Authorize Signature(s)

Note: All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.

**Performance Security
(Operation Service)**

..... **Bank’s Name, and Address of Issuing Branch or Office**.....

Beneficiary: National Water Supply & Drainage Board, Galle Road, Ratmalana, Sri Lanka

Date:

Performance Guarantee No.:

We have been informed that **name of the Contractor**. (hereinafter called "the Contractor") has entered into Contract No. **reference number of the Contract**. dated with you, for the execution of **name of contract and brief description of Works**. (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Contractor, we **name of the Bank**. hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of **name of the currency and amount in figures***. (**amount in words**.) such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the Day of , **, and any demand for payment under it must be received by us at this office on or before that date.

“The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed one year, in response to the Employer’s written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.”

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded.

.....
Seal of Bank and Authorize Signature(s)

Note: All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.

Advance Payment Security

.....[Issuing Agency's Name and Address of issuing Branch or Office]
.....
.....

Beneficiary: Chairman
National Water Supply and Drainage Board
Galle Road, Ratmalana

Date

ADVANCE PAYMENT GUARANTEE No.

We have been informed that [name of Contractor/Supplier] (hereinafter called "the Contractor") has entered in to Contract No. dated with you, for the Supply of [name of Contract and brief description] (hereinafter called "the Contract").

Furthermore, we understand that according to the conditions of Contract an advance payment in the sum [amount in figures] (.....) [amount in words] is to be made against an advance payment guarantee

At the request of the Contractor, we [issuing agency] hereby irrevocably undertake to pay you any sum or sums not exceeding in total and amount of [amount in figures] (.....) [amount in words] upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract.

We have been informed that the Beneficiary may require the Principal to extend this guarantee if the advance payment has not been repaid by the date 28 days prior to such expiry date. We undertake to pay you such guaranteed amount upon receipt by us, within such period of 28 days, of your first demand in writing and your written statement that the advance payment has not been repaid and that this guarantee has not been extended.

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor.

This guarantee shall expire on [28 days beyond the Completion Date]

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

This guarantee shall be governed by the laws of the Democratic Socialist Republic of Sri Lanka and shall be subject to the Uniform Rules for Demand Guarantee, published as number 758 by the international Chamber of Commerce, except as stated above.

.....
[Signature (s)]

Signature and seal of the guarantor
Witness:

Name:

Maintenance Retention Guarantee

..... **Bank’s Name, and Address of Issuing Branch or Office**

Beneficiary: Chairman, National Water Supply and Drainage Board Galle Road, Ratmalana

Date:

Maintenance Retention Money Guarantee No.:

We have been informed that **name of the Contractor**.(hereinafter called "the Contractor") has entered into Contract No. **reference number of the Contract**.datedwith you, for the execution of **name of contract and brief description of Works**. (hereinafter called "the Contract").

Furthermore, we understand that the Contractor wishes to receive early payment of [part of] the retention money, for which the contract requires him to obtain a guarantee.

At the request of the Contractor, we **name of the Bank**.hereby irrevocably undertake to pay you any sum or sums not exceeding in total the amount of. **name of the currency and amount in figures***. (**amount in words**.) such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing accompanied by a written statement stating:

- (a) that the Principal has failed to carry out his obligation(s) to rectify certain defect(s) for which he is responsible under the Contract, and
- (b) the nature of such defects.

This guarantee shall become effective upon receipt of the advance payment, or, where applicable, the first installment thereof, by the Principal. Such guaranteed amount shall be reduced by the amounts of the advance payment repaid to you from time to time as evidenced by the Interim Payment Certificates issued under Sub-Clause 14.7 of the Conditions of Contract. Following receipt by us from the Principal of each Interim Payment Certificate, we shall promptly notify you of the revised guaranteed amount.

Any demand for payment must contain your signature (s) which must be authenticated by your bankers or by notary public. The authenticated demand and statement must be received by us at this office on or before _____ (the date 70 days after the expected date of completion of the Design-Build) (the "expiry date"), when this guarantee shall expire and shall be returned to us.

If the advance payment has not been fully repaid 28 days prior to the expiry date, we undertake, upon receipt of your written demand and statement that the advance payment has not been repaid, to pay you the guaranteed amount within 28 days of your demand.

This guarantee shall be governed by the laws of _____, and shall be subject to the Uniform Rules for Demand Guarantees, published as number 458 by the International Chamber of Commerce, except as stated above.

..... **Seal of Bank and Signature(s)** Section 7 – Conditions of Contract 7-49.

Note: All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.

** The Guarantor shall insert an amount representing the percentage of the Contract Price specified in the Contract and denominated either in the currency(ies) of the Contract or a freely convertible currency acceptable to the Employer.*

*** Insert the date twenty-eight days after the expected completion date. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months] [one year], in response to the Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."*

Operating Licence
(draft version)

[on letterhead paper of NWSDB]

[date]

Licence to Operate a Desalination Plant at Jaffna

Preamble:

- 1) The National Water Supply and Drainage Board (NWSDB) is responsible for providing piped potable water services in Democratic Socialist Republic of Sri Lanka; and
- 2) The NWSDB intends to build and operate a sea water reverse osmosis plant and associated transmission pipelines at [xxxxx] to increase supplies of potable water to the Jaffna region; and
- 3) The NWSDB has identified a site at [xxxxxx] (the “Site”) for the proposed plant and associated transmission pipeline and hereby warrants that it is the owner of the Site; and
- 4) The NWSDB has conducted a public tender to select a Contractor to design, build and operate a new SWRO plant at the Site under a long term contract (hereinafter the “DBO Agreement”); and
- 5) The NWSDB has awarded the DBO Contract to [*name of contractor*] hereinafter the Contractor; and
- 6) Under the terms of the DBO Agreement the NWSDB is required to issue an Operating Licence to the Contractor which shall form part of the DBO Agreement.

Terms of the Operating Licence:

- 1) The Contractor is hereby authorized, subject to the terms of any applicable environmental laws and licenses and compliance with these, to operate and maintain the SWRO treatment plant and associated structures as set out in the DBO Agreement and to provide desalinated potable water to the NWSDB at the contracted quantity and quality.
- 2) In consideration of the Contractor’s performance of the activities set out in the DBO Agreement, but only to the extent provided for in the DBO Agreement, the NWSDB grants the Contractor for the term of the DBO Agreement, the exclusive right, license and authority to occupy, use and enjoy the Site free of charge and free and clear of all alternative site usage claims, and to freely access the Site.
- 3) Notwithstanding its grant of rights set forth herein, the Contractor shall have no right of property or ownership over the Site and of the Works.

This Licence shall come into full force and effect upon the issue of the Commissioning Certificate required under GCC Clause 11.7 of the DBO Agreement and shall remain in force during the Operation Service Period as defined in GCC Clause 1.1.58, unless terminated earlier pursuant to GCC Clause 15 of the DBO Agreement.

Definitions

The terms and expressions in this licence shall have the meanings ascribed to them in the DBO Agreement.

Signed:

Position:

For the National Water Supply and Drainage Board

**GOVERNMENT OF THE DEMOCRATIC SOCIALIST REPUBLIC
OF SRI LANKA**

MINISTRY OF CITY PLANNING & WATER SUPPLY

NATIONAL WATER SUPPLY AND DRAINAGE BOARD

**JAFFNA KILINCHCHI WATER SUPPLY AND SANITATION PROJECT
– ADDITIONAL FINANCING**

LOAN NO: 37378-SRI

**Design, Build and Operate (DBO) of a 24 MLD
Sea Water Reverse Osmosis (SWRO)
Desalination Plant at Thalaiyadi, Jaffna
District, Sri Lanka**

**CONTRACT NO.: PEIC/JKWSSP/SEA WATER REVERSE
OSMOSIS PLANT/2015/01**

Answer for Queries

**Project Director's Office
Jaffna-Kilinochchi Water Supply and Sanitation Project
National Water Supply and Drainage Board
KKS Road
Jaffna
Sri Lanka
May 2017**

Design, Build and Operate a Sea Water Reverse Osmosis Desalination of 24 MLD Capacity at Thalayadi, Jaffna District

The answers to the quires are listed below. The answers are to be read in conjunction with **revised bidding document**.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
1.	01-01-01	Part I Part II	Section 2 Bid Data Sheet Section 6 Employer's requirement	Page 2-3 Page 6-70	ITB 13.1 Chapter 6.1.4	As per ITB 13.1 of Section 2 Bid Data Sheet, the alternative offer is not permitted; however, in Chapter 6.1.4 of Section 6 Employer's requirement, the employer can consider the alternative pre-treatment system under the scenario indicated in table 6-1. We understand that the bidder is free to choose either one of the four identified pre-treatment scenarios in table 6-1 of Section 6 without the need to provide a base solution (i.e. DAF+ UF). Please confirm.	As per ITB 13.1: Alternative offers are not permitted. Refer Revised Bidding Document : Section 6: ERQ: Chapter 6 – Pre-treatment Facilities
2.	01-01-02	Part I	Section 2 Bid Data Sheet	Page 2-4	ITB 18.4 (a) (ii)	We understand that all imported foreign good/ material in Price Schedule 1 will be imported under the name of Employer (i.e. consignee name shall be the Employer) and any duties, custom dues, port charges shall be paid by the Employer directly to the Department of Customs or relevant local authorities on the production of Certified Custom Entries by the Contractor; Any VAT payable (if required) shall be charged to the Employer in addition to the Contract Price and shall be paid by the Employer separately as addition to the listed price in Schedule 1. Please kindly confirm.	Refer Revised Bidding Document; Section 7: GCC: Clause 14.1and Section 8: Part B: Special Provision; Clause 14.1;
3.	01-01-03	Part I	Section 2 Bid Data Sheet	Page 2-5	ITB 18.4 (b) (ii), 18.4 (d), 18.4 (e)	We understand that the price quoted locally under Contract in Price Schedule 2, Price Schedule 3, Price Schedule 4, Price Schedule 5, Price schedule 6 shall exclude VAT and any VAT payable shall be charged to the Employer as a separate item in addition to the Contract price and should be supported with VAT Registration Number. The Employer shall pay such VAT in addition to the Contract price. Please kindly confirm.	Refer Revised Bidding Document; Section 8: Part B: Special Provision; Clause 14.1

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
4.	01-01-04	Part I	Section 4 Bidding Forms	Page 4-65	Letter of Price Bid	We understand that the Final Contract Price transferred from price schedule No. 7 to the Letter of Price Bid shall be total foreign currencies and local currency excluding Custom duty, VAT and other taxes. Please kindly confirm.	Confirmed.
5.	01-01-05	Part I	Section 3 Evaluation and Qualification Criteria	Page 3-4	Chapter 2	Considering the nature of the experience required in Chapter 2.4, we suggest that references from the Bidder's parent companies, subsidiaries, or affiliates shall be admissible to satisfy the qualification criteria described. Please kindly confirm	Refer Revised Bidding Document; Section 3: Chapter 2: Qualification
6.	01-01-06	Part I	Section 3 Evaluation and Qualification Criteria	Page 3-8/9	Chapter 2.4.1	We understand that if the bidder is in a Joint Venture, only one partner of the JV needs to comply with the reference requirement of similar size and nature (i.e. EXP-1). As such, the requirement for Each partner will be replaced with "not applicable" instead of "must meet at least one Contract requirement". Please confirm.	Refer Revised Bidding Document; Section 3: Chapter 2.4.1
7.	01-01-07	Part II	Section 6 Employer's Requirement	Page 6-13	Chapter 1.3.1	As per the requirement of seawater intake system in Chapter 1.3.1, Section 6 Employer's requirement of ITB, please kindly confirm if our following understanding is correct: - the civil work and M&E works for offshore intake structure including the grills shall be constructed to cater for production capacity of 48 MLD; - Please confirm if the sizing of intake interconnecting pipes shall cater for total production capacity of 48 MLD, shall consist of 2 intake interconnecting pipes with each pipe catering for production capacity of 24 MLD. - The civil work of intake water pumping station within the desalination plant shall be constructed to cater for 48 MLD production capacity, while supply of M&E works (i.e. intake pumps) will cater for production capacity of 24 MLD.	The intake structure must be sized for production capacity of 48 MLD of potable water. The intake pipe should be a single pipe that can transfer up to production capacity of 48 MLD potable water. The civil work for intake pump station must make provision for a pumping capacity sized for production of 48 MLD of potable water. However only sufficient pumps need to be installed to achieve a pumping capacity sized for production of 24 MLD of potable water.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
8.	01-01-08	Part II	Section 6 Employer's Requirement	Page 6-14	Item (i), (m) of Chapter 1.3.2	With reference to Chapter 1.3.2 in Section 6, can we understand that if the bidder chooses to offer DAF (concrete type) as pre-treatment process; civil works including M&E works for DAF shall be sized for production capacity of 24 MLD and DAF is not required to be housed in a building. Please kindly confirm if our understanding is correct.	Refer Revised Bidding Document : Section 6: ERQ: Chapter 6 – Pre-treatment Facilities.
9.	01-01-09	Part II	Section 6 Employer's Requirement	Page 6-15	Item (o), (p) of Chapter 1.3.3	As per item (o) and (p), Chapter 1.3.3 of Section 6 Employer's requirement, we understand that the building housing the RO system shall be constructed to cater for 48 MLD production capacity with 2 RO stages. While supply of M&E work (i.e. single stage RO system, high pressure pump, energy recovery system, etc.) will cater for production capacity of 24 MLD. Please kindly confirm.	Refer Revised Bidding Document : Section 6: ERQ: Chapter 6 – Pre-treatment Facilities and Chapter 7 – Reverse Osmosis System – 7.1

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
10.	01-01-10	Part II	Section 6 Employer's Requirement	Page 6-20	Chapter 1.3.10	<p>As per Chapter 1.3.10 of Section 6 Employer's requirement, we understand that the incoming HV power supply and associated high voltage panel shall be sized for production capacity of 48 MLD. However, subsequent electrical works downstream of HV panel (i.e. transformer, low voltage panel, MCCs, generator, etc.) including associated electrical buildings/rooms will be only sized for production for 24 MLD. Bidder shall make provision within the treatment plant area for future expansion to 48 MLD. Please kindly confirm.</p>	<p>The incoming power supply must have sufficient capacity to cater for the ultimate operation of the site. This includes:</p> <ol style="list-style-type: none"> (1) For the full system to produce of 24 MLD of potable water from Intake to Potable Water Conveyance, out fall system, Administrative facilities and Operating system. (2) The addition of another 24 MLD potable water (3) The addition of further treatment to reduce the Boron from 2.4 mg/l to 1 mg/l (4) The addition of a DAF plant <p>The electrical works downstream of HV panel shall be sized for ;</p> <ol style="list-style-type: none"> 1. The production of 24 MLD of potable water from Intake to Potable Water Conveyance, out fall system, Administrative facilities and Operating system 2. The addition of further treatment to reduce the Boron from 2.4 mg/l to 1 mg/l 3. The addition of a DAF plant
11.	01-01-11	Part II Part III	Section 6 Employer's Requirement Section 9 Contract Form	Page 6-40 Page 9-15	Chapter 3.2.1 Appendix 3 - Time Schedule	<p>As per design review deliverables indicated in Chapter 3.2.1 of Section 6 Employer's requirement, 60% complete design - 1st Formal issue to the Employer for further review and approval - shall be completed within 6 months (180 days) from the contract commencement;</p> <p>As per Appendix 3 of Section 9 Contract Form, the design of whole works shall be 180 days from the effective date.</p> <p>As such, we understand that the completion of the design work within 180 days indicated in Appendix 3 of Section 9 Contract Form refers to 60% complete design as in Clause 3.2.1 of Section 6. Please kindly confirm.</p>	<p>Refer Revised Bidding Document : Section 6: ERQ: Chapter 3 – 3.2.1 and Section 9: COF Appendix 3</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
12.	01-01-12		Section 6 Employer's Requirement	Page 6-98	Chapter 13.1	<p>We understand that the administration building is constructed to cater for the production capacity of 48MLD. As such, the main control room located in the Administration biding shall be constructed for the production capacity of 48 MLD instead of 24MLD; while supply of M&E works (i.e. SCADA) will cater for production capacity of 24 MLD. Bidder shall consider that the plant control system shall easily expandable to accommodate the doubling of the plant to 48 MLD production capacity. Please kindly confirm.</p>	<p>The control room must cater for 24 MLD production capacity but must have sufficient space for the subsequent expansion of the plant with the addition of a further 24 MLD, a second pass for Boron reduction and a DAF plant. Collectively this is the ultimate plant capacity.</p> <p>The control systems must be similarly sized. In the case of the SCADA system there must be sufficient points and storage to cater for the ultimate plant capacity. That is the expansion must be able to be connected to the SCADA without the addition of new hardware or software.</p>
13.	01-01-13		Section 8 Particular Conditions of Contract		Part A contract data Item 4.2	<p>As per item 4.2 of Section 8, the performance bond during the operation service shall be 12% of the letter of acceptance (LoA) operation service price, reduced to 7% after three years of delivery of operation and further reduced to 5% at Contract Completion Certificate and which 5% is returned at the completion of the Maintenance retention period. Please kindly define the period for "maintenance retention period".</p>	<p>Refer Revised Bidding Document : Section 8: Part A - 4.2 and Part B - 4.2</p>
14.	01-01-14		Section 8 Particular Conditions of Contract Section 9 Contract Form	Page 8-3 Page 9-15	Part A contract data Item 9.2 Appendix 3	<p>As per item 9.2 of Section 8, the time for completion of Design and Build period is 910 days from the commencement Date; However, in Appendix 3 of Contract Form, the supply and installation services excluding operation and maintenance of the whole work specified in Section 6 shall be 730 days from the effective date. There is a discrepancy on the time for completion of design and build work.</p> <p>We understand that there is a typo error in Appendix 3 of Contract Form, the supply and installation services excluding operation and maintenance of the whole work specified in Section 6 shall be 910 days from the effective date. Please kindly confirm</p>	<p>Refer Revised Bidding Document : Section 9: COF Appendix 3</p>

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15.	01-01-15		Section 9 Contract Form Section 6 Employer's Requirement	Page 9-19 Page 6-21	Appendix 7 Functional Guarantee Chapter 1.5.1	As per Chapter 1.5.1 Schedule of Guarantee of Section 6 Employer's requirement, the energy efficiency of the SWRO desalination plant shall be calculated excluding the high lift potable water pump, Area lighting and Administration Building. As such, we understand the guarantee for energy in Chapter 3 of Appendix 7 Functional guarantees (i.e. Equal or lower than 3.8 kWh/m ³) shall be only limited to the process units and excluded the high lifting potable water pumps, area lighting, air conditioning, and administration building. Please kindly confirm.	Refer Revised Bidding Document : Section 6: ERQ: Chapter 15 Schedule of Guarantee and Performance - 15.2
16.	01-02-01	Part II Part I	Section 6 - Employer's requirement Section 4 - Bidding Forms	Page 6-20 Page 4-70/71	Chapter 1.4 of Section 6 item 11 of Schedule 1 and Schedule 2 of Section 4	In Chapter 1.4, Section 6 Employer's requirement of ITB, there is a requirement of mandatory spare part for 12 months' retention period. We understand that such mandatory spares are not part of the spares listed under Asset Replacement Fund in Schedule 6, Section 4. Mandatory spares are spares for normal wear and tear required for 12-month operation and such spares are price as mandatory spares as per item 11 in Price Schedule 1 and Price Schedule 2 respectively. The Contractor shall hand over to the Employer the mandatory spares upon completion of Operation Service Period (i.e. upon issuance of Contract Completion Certificate) as per list of breakdown of spares attached to price schedule 1 and price schedule 2 respectively. Kindly confirm.	Refer Revised Bidding Document : Section 6: ERQ: Chapter 1 – 1.7
17.	01-02-02	Part II Part I	Section 6 - Employer's requirement Section 4 - Bidding Forms	Page 6-20 Page 4-70/71	Chapter 1.7.2 (d)	In Chapter 1.7.2, Section 6 , it is mentioned that the inventory spares include high pressure pumps, UF and RO membranes. Since such item has life expectancy of more than 5 years, we understand that such spares shall be listed under Asset Replacement Fund in Price Schedule 6 and will not form part of mandatory spares in Price Schedule 1 & 2. Kindly advise if the bidder need to price for 1 extra high pressure pump to be kept as inventory spares.	Refer Revised Bidding Document : Section 6: ERQ: Chapter 1 – 1.7 Section 4: Price Schedule 6 – Asset Replacement At the end of the operating period the contractor will ensure that one high pressure pump is provided with the inventory of spares at the time of plant handover.

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18.	01-02-03	Part I Part II	Section 4- Bidding Forms Section 6- Employer's requirement	Page 6-22 Page 4-79	Schedule No. 5.1 Spares	As per Chapter 1.7.1, Section 6, spares that are consumables are not included in the asset replacement fund, which shall be considered as part of the cost of operating and maintaining the work. Based on Item 8 B of Preamble to Price Schedule, Section 4, replacement of short lived assets (assets with a lifespan less than five years) required during Operation Service period shall be included in Schedule 5.1 Contractor's Fixed Fee. As such, we understand that spare parts (other than listed item under Asset Replacement Fund) for 7-year operation service shall be priced under Schedule 5.1 Contractor's Fixed Fee. This is in addition to the mandatory spare parts that are price under item 11 in Price Schedule 1 and 2. Please kindly confirm.	Refer Revised Bidding Document : Section 4: Preamble, Price Schedule 1, 2 and 6. Section 6: ERQ: Chapter 1 – 1.7 Price Schedule 1 & 2: for Mandatory Spare Parts including O & M spares that have less than five years asset life. Price Schedule 6: Asset Replacement Fund for 5 th , 6 th , 7 th and one more year after Contract Completion.
19.	01-02-04	Part I	Section 4- Bidding Forms	Page 4-76	Schedule No. 4.3 Item 12: Providing Spare Parts as directed by the Employer's Representative	We understand that item 11 under Price Schedule 4.3 refer to provision sum for additional spare parts as directed by the Employer's Representative. This additional separate spare parts are in addition to mandatory spare parts price under item 11 in Schedule 1 & 2. Please kindly confirm.	Confirmed. It is not Item 11. The Item 12 (in previous bidding document) and Item 14 (in Revised Bidding Document) in Schedule No. 4.3 shall be utilised as per the Employer's Representative requirement only.
20.	01-02-05	Part I Part II	Section 4- Bidding Forms Section 6 - Employer's requirement	Page 4-76 Page 6-24	Schedule No. 4.3 Item 8 Chapter 2.1.1	As per Chapter 2.1.1, Section 6, the Contractor need to prepare influent water quality testing protocol and commence the water quality analysis. this water quality analysis shall continue up to completion of the design phase and thereafter follow by weekly water quality analysis up to successful commissioning of the Plant. We understand that the above said raw water testing during design period up to commissioning of the plant shall be cover under the provision sum as listed under Item 8 of Price schedule 4.3. Please confirm.	No. The cost for water quality testing to cover the parameters listed in Tables 2-1 and 2-2 shall be included to the Contractor's Bid. The Provisional Sum under Item 8 of Price schedule 4.3 shall be utilised as per the Employer's Representative requirement only.

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21.	01-02-06	Part I	Section 4- Bidding Forms	Page 4-76	Schedule No. 4.3 Item 8	Item 8 in Schedule 4.3 refer to sub-clause 10.3. Can you confirm if this sub-clause 10.3 is referring to sub-clause 10.3 in the General Conditions of Contract?	Not the Item 8, the Item 10 in Schedule 4.3 refers to Sub Clause 10.3 of GCC.
22.	01-02-07	Part I Part II	Section 4- Bidding Forms Section 6 - Employer's requirement	Page 4-76 Page 6-20	Schedule No. 4.3 Item 11 Chapter 1.3.10	As per Item J, Chapter 1.3.10 of Section 6, the Contractor shall provide a diesel generator of sufficient size to power the controlled shutdown of the plant in the event of a complete power outage. We understand that the above is the requirement of 1 MW capacity diesel generator set as listed under Item 11 of Price schedule 4.3 and such item shall be provisional sum.	No. Refer Revised Bidding Document : Section 6: ERQ: Chapter 14 - Electrical Supply System - 14.3
23.	01-02-08	Part I Part III	Section 4- Bidding Forms Section 8 - Special Conditions of Contract	Page 4-76 Page 8-4	Schedule No. 4.3 PCC 13.5	In accordance with PCC 13.5, we understand that the bidders are free to propose the % of overheads and profit for Provisional Sum as listed under Schedule No. 4.3. Please confirm.	Refer Revised Bidding Document : Section 4 : BDF - Schedule No. 4.3 and Section 8: PCC Part A: Contract Data Sub Clause 13.5.

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24.	01-02-09	Part I	Section 4- Bidding Forms	Page 4-74	Schedules No. 4.1	<p>As per Schedule No.4.1, the bidder need to include Item 8 (Allow for Provision and maintenance of Site Safety Facilities), Item 9 (Allow for Provision and maintenance of Environmental and Social Management Facilities), Item 10 (Allow for Provision for implement the Environmental Management Plan) for 114 months (i.e. 30 months for design & build and 84 months for operation services)</p> <p>We understand that Schedule 4.1 is meant to cover the price for design and build period (i.e.30 months). Cost incurred during operation service period shall be priced in Price schedule 5 & 6 respectively. As such, Item 8 (Allow for Provision and maintenance of Site Safety Facilities), Item 9 (Allow for Provision and maintenance of Environmental and Social Management Facilities), Item 10 (Allow for Provision for implement the Environmental Management Plan) under Schedule 4.1 shall be limited to 30 months. The remaining 84 months (Operation Service period) for the said scope shall be price separately under Price Schedule 5.1. Please advise.</p>	<p>Refer Revised Bidding Document : Section 4: BDF - Schedule No. 4.1 Item 8, 9, 10 and 11 are to cover DBO period. Also the bidders shall include any further relevant items under Schedule 4.1. Schedule 5.1: Refer Preamble</p>
25.	01-02-10	Part I	Section 4- Bidding Forms	Page 4-80	Schedules No. 5.2	<p>As per ITB 18.6 of Section 2, price schedule 5.2 shall be adjustable based on price adjustment formula. For purpose of fair comparison, unit rates for calculation of operating cost under Schedule 5.2 should be the same for all bidders.</p> <p>As such, kindly provide us the reference unit rate (i.e. chemical cost, disposal cost, etc.) for calculation of operating cost for Price Schedule 5.2.</p>	<p>The Price Adjustment is applicable during the Operation Service Period. The Bidder shall quote for all 7 years of Operation Service Period.</p>

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26.	01-02-11	Part I	Section 4-Bidding Forms	Page 4-81	Preamble, D. Schedule 5.3 (3)	In item 3 of Schedule 5.3, Preamble to Price Schedule; we understand that the electricity cost is based on prevailing charges from CEB during operation service period and this electricity cost during Operation Service period include only the electricity cost for intake pumping station, SWRO Desal Plant. Electricity cost during Operation Service Period exclude electricity cost for 10 ML potable storage tank and potable water supply pumps (excluded from the scope of Operation Service period). and electricity cost for area lighting and administration building shall be under Schedule 5.1 Contractor's Annual Fixed Fee. Kindly confirm.	Refer Revised Bidding Document : Section 4: BDF – Preamble and Schedule No. 5.3.
27.	01-02-12	Part I	Section 4-Bidding Forms	Page 4-6	Form AT1-LTB	As per item 26 of Form AT1-LTB, the SWRO membrane useful life guaranteed to be as least 5 years; while item 66 of Form AT1-LTB, the SWRO membrane useful life is minimum 7 years. We understand that the minimum useful life guarantee for SWRO membrane useful life shall be minimal 5 year in the functional guarantee. Please kindly confirm.	Refer Revised Bidding Document : Section 4: BDF – Form AT1-LTB.

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28.	01-02-13	Part II	Section 6 - Employer's requirement	Page 6-21	Chapter 1.5.2	<p>As per Chapter 1.5.2 in Section 6, membrane replacement frequency not to exceed 13% each year. However, the membrane replacement frequency is not linear during the 7-year DBO contract. i.e. in the initial 3 years, the membrane replacement may be zero; however, from year 4 to end of year 7, the membrane replacement frequency will increase exponentially where by end of year 7, the membrane may need to be replaced completely as the membrane reaches end of useful lifecycle.</p> <p>As such, we suggest to remove this parameter in the plant functional guarantee and only the SWRO membrane useful life shall be guaranteed. It is not practical to guarantee replacement frequency of less than 13% annually. If required, the membrane replacement frequency can be reworded as pro-rata of 14.3% over 7 years' period.</p> <p>Please kindly consider our suggestion.</p>	Refer Revised Bidding Document : Section 6: ERQ – Chapter 1.5.2 and 15.7
29.	01-02-14	Part II	Section 6 - Employer's requirement	Page 6-93	Chapter 11.1.2 Table 11-1	<p>Typically, membrane cleaning room and chemical feed room shall be located in the same building of SWRO room or a separate room next to the RO building, not a part of the administration building. We understand that the bidder is free to locate and size the membrane cleaning room and chemical feed room accordance with their own process design. Membrane cleaning room and chemical feed room need not to be part of Administrative Building as long as such rooms are allocated elsewhere in the plant. kindly confirm.</p>	<p>The Contractor may locate the chemical delivery, storage and usage where it chooses. However, for safety and efficiency Contractors should keep chemicals and chemical related activities away from the administration building and preferably located in the same area which would mostly be the RO building. The traditional design of an SWRO plant should be used in this regard.</p> <p>Refer Revised Bidding Document : Section 6: ERQ – Chapter 11.1.2 Table 11-1</p>
30.	01-02-15	Part II	Section 6 - Employer's requirement	Page 6-27	Chapter 2.1.2.3	<p>As per Chapter 2.1.2.3 in Section 6, the Contractor is required to design and build all key equipment and facilities for a minimum of 0.3m above the general site level Kindly confirm.</p>	Finished floors of all buildings shall be a minimum 300 mm (0.3 meters) above the maximum existing ground elevation of SWRO plant site.

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31.	01-02-16	Part II	Section 6 Employer's Requirement	Page 6-104	Chapter 15.4 Table 15.1	In Chapter 15.4 of Section 6, total RO plant daily average power consumption shall be not exceed unit power consumption of 3.5kWh/m3 or a lower value. However, the energy to be guaranteed in table 15-1 of Section 6 is 3.8 kWh/m3 or lower. Kindly clarify the discrepancies. Please also clarify if the power consumption measured here are limited to Intake Pumping stations and SWRO Desal Plant but exclude potable water supply pumps, area lighting and administration building.	The "Energy – SWRO Plant - 3.8 kWh/m3 [or lower amount as proposed by bidder]" in the Table 15.1 refers to the average daily power consumption to produce 24 MLD of potable water from sea water. It does not include the power for other site activities including the administration or residential areas, site lighting or the potable water pumping station
32.	01-02-17	Part II	Section 6 Employer's Requirement	Page 6-108	Chapter 16.2	In Table 16-1 of Section 6, the table seems to indicate that NWSDB's non-technical staffs (i.e. 1 store keep, 1 health & safety Officer, 1 Laboratory Technician, 1 Secretary, 1 accountant /purchasing, 1 driver, 2 helpers the supporting staff) shall be at the SWRO Desal Plant from year 1 onwards whereas NWSDB's key technical staffs (Plant Manager, Senior Operator, etc.) will only be at the plant from year 6 onwards. Could this be an error on the colouring of the table and we understand that NWSDB's key staffs (both technical and non-technical) will only be at site from the year 6 to year 7 during Operation Service Period. Only one staff from NWSDB which NWSDB's representative will be on site for the whole operation service period duration. Please confirm.	Refer Revised Bidding Document : Section 6: ERQ – Table 16-1 and Chapter 16.16

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33.	01-02-18	Part III Part II	Section 9 : Contract Form Section 6 Employer's requirement	Page 9-6	Appendix 1 Terms and procedures of payment Attachment.4. 1 Design Review Deliverables	<p>As per Appendix 1 to Contract Agreement under Section 9, we like to seek clarification on the definition of milestone payment for design services and the deliverables with regards to such payment:</p> <ul style="list-style-type: none"> - 30% of the total design service amount upon acceptance of <u>preliminary design</u>. Please define deliverables of preliminary design with relation to the submittals required under Attachment 4.1 (design review deliverables) in Section 6 or can we understand that completion of preliminary design is the same as 45% design completion as defined under Attachment 4.1. - 80% of the total design service amount upon final design by Employer's representative. Please define deliverables of final design with relation to the submittals required under Attachment 4.1 (design review deliverables) in Section 6 or can we understand that completion of final design is the same as 75% design completion (define as IFC) as defined under Attachment 4.1. <p>Please kindly confirm</p>	Refer Revised Bidding Document : Section 6: ERQ Chapter 3.2.1 Section 9: COF Appendix 2
34.	01-02-19	Part III Part II	Section 9 : Contract Form Section 6 Employer's requirement	Page 9-15 Page 6-40	Appendix 3 - Time Schedule Chapter 3.2.1 and Attachment 4.1 Design Review Deliverables	<p>As per Appendix 3 to Contract Agreement under Section 9, design period is defined as 180 days from effective date whereas design period is defined as 8 months (240 days) under Attachment 4.1 (design review deliverables) in Section 6. Based on the definition of design deliverables under Attachment 4.1 of Section 6, completion of design period prior to construction is 75% complete (define as IFC) which is defined as period of 7 months from commencement date.</p> <p>Please kindly clarify the discrepancies above.</p>	Refer Revised Bidding Document : Section 6: ERQ Chapter 3.2.1 and Attachment A.4.1 Section 9: COF Appendix 2 and 3


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35.	01-02-20	Part III	Section 7 General Conditions of Contract		GCC14.7	<p>We understand that in the event that the Bidder is a Consortium (non-incorporated JV) of 2 or 3 companies, jointly and severally liable under the single contract between the Employer and the consortium, please confirm whether interim payment certificates and payments can be handled as follows:</p> <p>1) For each payment application, the Contractor issues an interim payment certificates to the Employer, in line with the Contractual payment terms. 2) The payment claim is supported by separate VAT certificates, one from each consortium member, with each certificate being under a separate VAT number. 3) The separate interim payment certificates will be compiled by the Leader of consortium into one single summary as (1) above. 4) After approved by the Employers' representative, The Employer makes one single payment to a consortium bank account, being the total of the separate VAT certificates. Please kindly confirm.</p>	<p>The Bidder shall follow the instruction given in Section 2 BDS: ITB 44.3. Further the Employer will only deal with a single entity to be named in the Bidders submission in relation to this Contract.</p>
36.	01-02-21	Part II	Section 6 Employer's Requirement	Page 6-62 Page 6-65	Chapter 3.12.25 & Chapter 5.2.1	<p>As per the requirement of seawater intake system in Chapter 3.12.25 of Section 6, "sea water intake velocity at the entry to the intake structure should not exceed 0.15m/s under any operating condition"; As per the requirement of seawater intake system in Chapter 5.2.1 of Section 6, "the entrance velocity of water through the intake tower bars openings shall be not more than 0.15m/s calculated at 50% of the installed water entrance surface area of the seawater screens". We understand the 0.15m/s velocity is the maximum velocity which passes through the intake screens, not the velocity required for intake main pipe. Please confirm.</p>	<p>The maximum velocity of the water entering the intake structure through the intake grill (or similar) is 0.15 m/s.</p>

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37.	01-02-22	Part II	Section 6 Employer's Requirement	Page 6-83	Chapter 9.2.1	As per the requirement of Chapter 9.2.1 of Section 6, on-site pump station building shall be with all required facilities to install 2nos of 6 MLD and 3nos of 12 MLD high-lift pumps. For sizing of the potable water pumps, we will have required the discharge head. As such, kindly advise us the discharge pressure or the pressure at the connection of water delivery point.	Refer Revised Bidding Document: Section 6: ERQ- Attachment A.2.5.a and A.2.5.b
38.	01-02-23	Part II	Section 6 Employer's Requirement	Page 6-77	Chapter 7.2.1	As per the requirement of Chapter 7.2.1, The retention of final particulate barrier contained in the pre-treated water shall be achieved through cartridge filtration. Installation of cartridge filtration system if granular media filters are used is compulsory. We understand that if UF is proposed as pre-treatment, cartridge filter will not be mandatory. Please confirm.	Refer Revised Bidding Document: Section 6: ERQ- Chapter 6 & 7
39.	01-02-24	Part II	Section 6 Employer's Requirement	Page 6-81	Chapter 8.2	Please kindly suggest the requirement for minimum value of alkalinity and Hardness in final treated water after re-mineralization.	Refer Revised Bidding Document: Section 6: ERQ- Table 2-4 Chapter 8 The values mentioned in Section 6: ERQ- Table 2-4 are maximum limits. The Post Treatment facility shall comply as mentioned in Section 6: ERQ - Chapter 8.
40.	01-02-25	Part II	Section 6 Employer's Requirement	Page 6-16	Chapter 1.3.5 (a)	We understand that the potable water tank 10 ML cannot be used as a calcium hypochlorite contact tank. A separate calcium hypochlorite contact tank with enough retention time will be proposed. Besides that, the potable tank volume of 10ML has been sized for the future extension. No additional potable tank is required for future phases when the SWRO desal plant is upgraded to final production capacity of 48 MLD. Please confirm.	The required contact time for the disinfection must be achieved upstream of the potable water storage tank. A space shall be provide for future expansion. Chlorine gas is to be used for disinfecting the product water.

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41.	01-02-26	Part II	Section 6 Employer's Requirement	Page 6-20 Page 6-31	Chapter 1.3.10 Chapter 3.2 (g)	As per Chapter 3.2 (g) of Section 6, the electrical supply facilities for the SWRO Desalination Plant require two 100% load 33kV incoming power supply. Please clarify if it meant that the SWRO Desal plant required 2 incoming HV power supply of 100% load each and each incoming HV electrical conduit power supply shall be size for production capacity of 48 MLD or 2 incoming HV electrical conduit with each HV electrical conduit cater for production capacity of 24 MLD with total load of 48 MLD? Please confirm.	Refer Revised Bidding Document. Section 6: ERQ: Chapter 3: Sub Clause 3.2. (g). Chapter 14, Clause 14.1. The electricity supply will be as follows: <ul style="list-style-type: none"> • one 33 kV high voltage line coming from the CEB grid to a 33kV/1.1 kV substation at the plant site • one high voltage 33kV to 1.1 kV step down substation located at the plant site • The above infrastructure will be provided by the CEB and able to support a 48 MLD plant and a provisional sum is provided for this. Power supply within the plant to be provided by the Contractor and able to support a 24 MLD plant to be provided by the Contractor and included in the bid price.
42.	01-02-27	Part III	Section 8 Special Conditions of Contract	Page 8-5	Sub-Clause 19.2(a)(i)	As per Sub-clause 19.2(a)(i), the permitted deductible limits is defined as none. This is contrary to general industrial practice for Contractor All Risk insurance during D&B period as such insurance policy always have deductible limits. As deductible limit is a Contractor's risk, it is in the interest of Contractor to procure an insurance with reasonable deductible limit. Typically, this specific sub-clause should provide what is the limit of deductible limits (i.e. 50,000 USD) allowed and the Contractor can choose to procure an insurance policy with deductible limit not exceeding the required amount or lower. Please amend this sub-clause to allowed for a reasonable deductible limit based on standard industrial practice.	Refer Revised Bidding Document: Section 8: PCC - Sub-Clause 19.2(a)(i)

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43.	01-02-28	Part III	Section 9 Special Conditions of Contract	Page 8-6	Sub-Clause 19.2(c)	As per Sub-clause 19.2(c), the amount of professional liability insurance is set at 120% of D&B amount of the Contract which is unusually high and unheard of in other similar Contracts. Such requirement may not be even available in the market. Typically, Professional liability insurance cover only the design amount in the contract. Please amend this sub-clause to be in line with standard industrial practice for amount to be covered under professional liability insurance	Refer Revised Bidding Document: Section 8: PCC - Sub-Clause 19.2(c)
44.	01-03-01	Part II	Section 6 - Employer's requirement	Page 6-19	Chapter 1.3.8	<p>We understand that the phasing of civil works and M&E works for the various process units within the SWRO Desalination Plant under the current phase shall be as follow;</p> <p>- Intake Pumping Station, UF/RO system and Potable pumping station : Building/Civil works housing such works shall be constructed to cater for 48 MLD production capacity whereas the M&E works to be installed shall cater for 24 MLD production capacity. As such, the associated chemical room and electrical room (i.e.MCC) for such work shall be constructed to cater for 48 MLD production capacity, while supply of M&E works(chemical storage tank, dosing pumps, MCC panels) will cater for production capacity of 24 MLD.</p> <p>DAF : Concrete structure for DAF including associated M&E works shall be constructed to cater for 24 MLD Production Capacity. Likewise chemical room/building and electrical room (i.e.MCC) for DAF shall be also sized for 24 MLD only. The Contractor shall make space provision for additional DAF structure including associated facilities within the SWRO Desal plant for the remaining production capacity of 24 MLD.</p> <p>Kindly confirm.</p>	<p>Refer Revised Bidding Document:</p> <p>Section 6: ERQ: Chapter 6; Chapter 3: Clause 3.7.3 Section 3: EQC: Table 3-3 Only provision for a DAF plant needs to be provided. This means connecting points and space allocation only.</p>

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45.	01-03-02	Part II	Section 6 - Employer's requirement	Page 6-69	Chapter 6.1.2	<p>As per the UF requirement in Chapter 6.1.2 of Section 6, Submerged type Ultrafiltration System will be provided to reduce SDI to a value suitable for RO membranes as well as reduce bacteria and virus.</p> <p>We understand that pressure type UF/MF system should also be acceptable in addition to submerged type , as long as the pressure type UF/MF offers the same performance.</p> <p>Kindly confirm.</p>	Refer Revised Bidding Document: Section 6: ERQ- Chapter 6
46.	01-03-03	Part II	Section 6 - Employer's requirement	Page 6-92 Page 6-93	Chapter 11.1.2 Chapter 11.1.3 Chapter 11.1.4	<p>We understand that the administration building, circuit bungalow with 4 rooms and quarters for NWSDB staff shall be constructed within desalination treatment plant area.</p> <p>Please provide the standard drawings and associated general specifications for administration building, circuit bungalow, and quarters.</p>	The Admin building and bungalow must be located within the compound. Refer Revised Bidding Document: Section 6: ERQ- Chapter 11.1.2, 11.1.3 & 11.1.4 and Attachment A.2.7 for Specifications.
47.	01-03-04	Part I Part II	Section 4 - Bidding Forms Section 6- Employer's requirement	Page 4-76 Page 6- 20	Item 2 of Schedule 4.3 Provision sum Item a of Chapter 1.3.10	<p>As per Item a, Chapter 1.3.10 of Section 6, the Contractor shall provide power supply infrastructure, electrical substation, step - down transformer, electrical isolation (breakers), cabling, bus ducts or any required connection to the Power Grid of Ceylon Electricity Board.</p> <p>We understand that the above said facilities (i.e. electrical substation, step - down transformer, electrical isolation /breakers, incoming HV power supply including bus ducts or any required connection to the Power Grid of Ceylon Electricity Board) shall be supply by CEB and Contractor is not allowed to supply such scope separately. The cost for such is subject to charges by CEB. As such, the said facilities for permanent power supply shall be cover under the Provisional Sum or provision of permanent power supply to the plant by CEB under Item 2 of Price schedule 4.3.</p>	<p>Refer Revised Bidding Document: Section 6: ERQ: Chapter 14, Clause 14.1.</p> <p>The electricity supply will be as follows:</p> <ul style="list-style-type: none"> • one 33 kV high voltage line coming from the CEB grid to a 33kV/1.1 kV substation at the plant site • one high voltage 33kV to 1.1 kV step down substation located at the plant site • the above infrastructure will be provided by the CEB and able to support a 48 MLD plant and a provisional sum is provided for this • power supply within the plant to be provided by the Contractor and able to support a 24 MLD plant and is to be provided by the Contractor and included in the bid price

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48.	01-03-05	Part II	Section 6 - Employer's requirement	Page 3 of 119	A.2.2	<p>Please kindly confirm if the below highlighted road in red cloud line shall be a permanent access road under the Contractor's scope. If so, please provide the specification and requirement for the said permanent road.</p> 	Refer Revised Bidding Document: Section 6: ERQ- Chapter 1.3.7.10 (u) General Site Service Facilities
49.	01-03-06	Part II	Section 6 - Employer's requirement	Page 6-106	Chapter 16 operation management requirement	<p>Please kindly provide us the handover procedure and conditions prior to Contract Completion Certificate (i.e. handover/completion of operation service period).</p>	Refer Revised Bidding Document: Section 6: ERQ- Chapter 16.16 Transition Plan
50.	01-03-07	Part II	Section 6 - Employer's requirement Attachment A.2.2	Page 6-11 Page 3 of A 2.2	Chapter 1.2.2 of Section 6 Chapter 1 of A 2.2	<p>As per Figure 1-2 SWRO desalination plant location, Chapter 1.2.2 of Section 6, the ocean intake structure for source seawater collection located more than 800m from the shore and the brine outfall structure shall be located more than 500m from the shore.</p> <p>However, in Fig-01, Attachment 2.2. The ocean intake structure for source seawater collection located more than 1000m from the shore and the brine outfall structure shall be located more than 700m from the shore.</p> <p>Please clarify the discrepancy.</p>	<p>The applicable distances are as follows:</p> <p>Distance from shore line (MWL):</p> <ul style="list-style-type: none"> • Intake structure: 800m • Outfall diffuser: 500m <p>Distance from seaward boundary of treatment plant site boundary:</p> <ul style="list-style-type: none"> • Intake structure: 1,300m • Outfall diffuser: 1,000m

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
51.	01-03-08	Part II	Section 6 - Employer's requirement Attachment A.2.1a Attachment A 2.2	Page 6-11 A 2.1a Page 3 of A 2.2	Chapter 1.2.2 of Section 6 Chapter 1 of A 2.2	<p>As per Figure 1-2 SWRO desalination plant location, Chapter 1.2.2 of Section 6, the SWRO Desalination Plant shall be constructed on a greenfield site of area 150 m X 200m .</p> <p>However, as per the map of the SWRO desalination plant site in Attachment 2.1a and Fig 01 of Attachment 2.2, the SWRO site area is approx. 200m X 200m</p> <p>Please clarify the discrepancy.</p>	The available area for SWRO Plant is 200m X 200 m
52.	01-03-09	Part II	Attachment A 2.2	Page 3 of A 2.2	Chapter 1 of A 2.2	<p>As per Fig-01 of A.2.2, the raw water intake pipe and brine outfall discharge pipe should be buried in separate culvert, and the minimum distance between two pipes is 50m.</p> <p>Since the distance between source seawater collection point and brine outfall point is 300m, we proposed to construct raw water intake pipe and brine outfall discharge pipe in one common culvert. This is a typical approach in other similar SWRO desal project elsewhere where intake pipe and brine outfall pipe are constructed in common culvert. Such construction approach would have minimal impact on the site and without affecting the intake point as discharge point for brine outfall is 300 m apart.</p> <p>Please kindly consider our suggestion.</p>	A common trench would be acceptable providing the intake structure and the diffuser are the at least the specified distance apart. Pipelines within the trench must be at least 1 meter apart.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
53.	01-03-10	Part II	Section 6 - Employer's requirement	Page 6-24, 6-88	Chapter 2.1.1 & 10.3	<p>As per Chapter 2.1.1, The intake source seawater system shall be designed & constructed by the Contractor on the basis of overall seawater recovery of 45% and ultimate plant Potable Water capacity of 48 MLD.</p> <p>However, in Chapter 10.3, it mentioned "The outfall pipe shall be a single pipe with hydraulic capacity designed to discharge all waste streams generated by a SWRO Desalination Plant of ultimate plant fresh water production capacity of future plant expansion (i.e. 48 MLD, minimum RO system, assuming a nominal recovery of 45%)."</p> <p>We understand the recovery rate of 45% is only for RO system, not applicable for the overall water plant.</p> <p>Please kindly confirm.</p>	<p>The recovery only refers to the RO membranes.</p> <p>The outfall pipe will also need to discharge commissioning water as well.</p>
54.	01-03-11	Part I	Section 1 - Instructions to Bidders	Page 1-4	ITB 4	<p>As per the requirement of eligible bidders in ITB 4 of Section 1, in case of the bidder is submitted by a Joint Venture, all partners shall be jointly and severally liable and the Joint Venture shall nominate a representative who shall have the authority to conduct all business for and on behalf of any and all the partners of the Joint Venture during the bidding process and, in the event the Joint Venture is awarded the Contract, during contract execution.</p> <p>We understand that in the case of an non-integrated Joint Venture/Consortium where all partners shall be jointly and severally liable, all the partners shall be entered into the Joint Venture/Consortium Agreement and it is not necessary to incorporate a new legal joint venture entity in Sri Lanka.</p> <p>Please kindly confirm</p>	<p>Refer Revised Bidding Document: Section 2: BDS, Sub Clause 11.2 (k) and 44.3</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
55.	01-04-01	Part III	Section 9 - Contract form Appendix 7 Functional Guarantees	Page 9-19	Clause 2 and Clause 3	<p>Preconditions under Clause 2, Appendix 7: We understand that the functional guarantee indicated in Clause 3, Appendix 7 of Section 9 are subjected to the preconditions of raw water quality listed in Table 2-1 and Table 2-2 of Section 6 being fully satisfied.</p> <p>Please kindly confirm.</p>	<p>The Bidder shall refer Section 6: ERQ-Chapter 2 - Tables 2-1 and 2-2 to prepare their proposal to meet the requirements in Section 9: COF - Sub Clause 3 of Appendix 7.</p> <p>Refer Revised Bidding Document: Section 6 : ERQ: Chapter 2 – Sub Clause 2.1.1 – Raw Water Quality</p>
56.	01-04-02	Part III	Section 9 - Contract form Appendix 7 Functional Guarantees	Page 9-19	Clause 4	<p>As per table 2-4 of Section 6, we understand that the critical parameters for the product water are E Coli and Cryptosporidium, Lange liar Saturation Index (LSI) and total Recoverable Hydrocarbons. And other parameters listed in table 2-4 are non-critical parameters;</p> <p>Regarding to Liquidated Damage for non-compliance with potable water quality requirements in Item 3 of Clause 4 of Appendix 7:</p> <ul style="list-style-type: none"> - 50% of the contractor's daily fixed fee amount if non-compliance of the non-critical parameters for the product water, which is accepted by the Employer; - 100% of all the contractor payment for the operation service for each day if non-compliance of the critical parameters for the product water, which is not accepted by the Employer. <p>Please kindly suggest if our understanding is correct.</p>	<p>The parameters listed in Table 2-4 mirror those listed in the Sri Lankan Drinking Water Standards and as such all are required to be met.</p> <p>Refer Revised Bidding Document: Section 6 : ERQ: Chapter 2 – Sub Clause 2.3 – Potable Water Quality and Section 9: COF: Appendix 7 – Sub Clause 4 – Item 3.</p>
57.	01-04-03	Part III	Section 9 - Contract form Appendix 1 Terms and Procedures of Payment	Page 9-5	Schedule No.1	<p>As per the payment terms requirement in Appendix 1 of Section 9 Contract Form, The price under Schedule No.1 plant and mandatory spare parts supplied from abroad shall be in CIP basis.</p> <p>Please advise us nearest port of destination for imported goods including custom clearance.</p>	<p>CIP Thalayiadi INCOTERMS 2010 for all items for the Intake & Sea outfall System and Treatment plant and Treated Water Transmission Main from Thalayiadi to Puthukadu Junction.</p> <p>The Bidder shall check the availability of ports.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
58.	01-04-04	Part I	Section 1 - Instructions to bidders	Page 1-3	Chapter 2.1 Source of Fund	<p>As per chapter 1 of Section1, ITB, The Democratic Socialist Republic of Sri Lanka and Asian Development Bank has signed a finance agreement for Jaffna Kilinochchi Water Supply and Sanitation Project- Additional Financing.</p> <p>Please advise us the amount of financing and expiry date of the said finance agreement for this project. Please also advise us if the project will be supplement by other source of funding. If yes, please advise us the source and amount of this additional funding.</p>	The Contract for the Works is with the Government of Sri Lanka.
59.	01-04-05	Part III	Section 8 - Particular Conditions of Contract	Page 6-2 8-2	Sub-Clause 4.2 of Part A	<p>As per Sub-Clause 4.2 in Part A-Contract Data of PCC, performance guarantee security amount for the Design and Build part of the Contract shall be 8% of Design and Build contract price and will be reduced to 2% accordingly upon issuance of Commissioning certificate. The 2% performance guarantee security shall be returned to the Contractor at the completion of retention period. We understand that the sentence under this Sub-clause shall prevail over this sentence "Reduction in Performance Security at the end of the retention period is 50%." which was stated under the same Sub-clause 4.2 in Part A- Contract Data, PCC.</p> <p>Please kindly confirm.</p>	Refer Revised Bidding Document: Section 8: PCC: Part A: Contract Data: Sub Clause 4.2.
60.	01-04-06	Part I	Section 2 Bid Data Sheet	Page 2-6	ITB 21.1	<p>As per ITB 21.1 of Section 2 Bid Data Sheet, we understand that the bid bond shall be validated till 26 February 2018, i.e. 298 day from the deadline or any extended deadline for submission of bids.</p> <p>As standard requirement by all issuing bank for bank guarantee, the bank guarantee will need to indicate an actual date as end of validity of the bank guarantee. As such, please confirm that the end date of the bid bond shall be 26 February 2018 and shall added in the format of the bid security given in Section 4.</p> <p>Please kindly confirm.</p>	The wordings remain same as "298 day from the deadline or any extended deadline for submission of bids". The Bidder shall calculate the end date of the bid bond from the dead line.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
61.	01-04-07	Part III	Section 7 General Conditions of Contract		GCC 14.19	<p>As per GCC 14.19, during the operation service period, a maintenance retention fund shall be created by deducting 5% from the value of each interim payment.</p> <p>Our understanding for the maintenance retention fund is as that the 5% maintenance retention fund (deducted monthly from value of each monthly interim payment) can be released to the Contractor at the end of each Operation Service year (i.e. completion of 12 month operation period) in exchange with an equal amount Maintenance Retention Guarantee security in the form of unconditional bank guarantee and such bank guarantee shall be valid for 12 months.</p> <p>Please kindly confirm.</p>	<p>Interpretation is incorrect. The Section 7: GCC: Sub Clause 14-19 shall remain same.</p>
62.	01-05-01	Part II	Section 6 - Employer's requirement	Page 6-67	Chapter 5.3.1	<p>As per intake screen requirement indicated in Chapter 5.3.1, Section 6 Employer's requirement, a band screen with the openings not larger than 3mm is required located at the upstream of the intake pumps.</p> <p>Please kindly confirm that if the bidder propose a grille at the intake structure with screen opening of 3mm, the required band screen specify in Chapter 5.3.1, Section 6 will not be required.</p>	<p>The screen at the Intake Structure shall meet the design requirement of "The entrance velocity of the water through the intake tower bars openings shall be not more than 0.15 m/s calculated at 50% of the installed water entrance surface area of the seawater screens."</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
63.	01-05-02	Part II	Section 6 - Employer's requirement	Page 6-81	Chapter 8.3	<p>As per requirement in Chapter 8.3 of Section 6 Employer's requirement, a calcium hypochlorite disinfection system shall be constructed to deliver concentration of 0.5 to 2.5 mg/L chlorine into the distribution system. In the SWRO Desalination plant, Sodium Hypochlorite (which is often use as disinfection agent) will be required for CIP of UF. If Calcium Hypochlorite is use for disinfection of treated water, there will be 2 different type of chlorine based chemicals in the plant.</p> <p>As such, please kindly confirm if the bidder can propose sodium hypochlorite (NaOCl) as disinfectant (in replace of calcium hypochlorite) as long as the chlorine concentration at treated water comply with the requirement of 0.5 to 2.5 mg/L.</p>	<p>Sodium hypochlorite is to be used for disinfection and the control of biological growth throughout the plant. Chlorine gas is to be used for disinfecting the product water.</p>
64.	01-06-01	Part II	Section 6 - Employer's requirement	Page 6-117	Chapter 16.12.8.4	<p>As per the operation & maintenance requirement in Chapter 16.12.8.4 of Section 6 Employer's requirement, the contractor shall be responsible for the operation and maintenance of potable water transmission line.</p> <p>However, as per Page 18 of Amendments and Clarifications of the pre-bid meeting materials, it is presented that the operation interface is terminated at chlorination tank/UV (for future). The operation and maintenance for product water tank, high lift pump station and potable water transmission lines shall be excluded from the Contractor's scope.</p> <p>We understand that the operation interface terminated at the chlorination tank/UV (for future) indicated in Amendments and Clarifications of the pre-bid meeting materials shall prevail over Chapter 16.12.8.4 of Section 6 Employer's requirement. Please kindly confirm.</p>	<p>Confirmed. The Sub Clause 16.12.8.4 in Chapter 16 of Section 6 is deleted.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
65.	01-06-02	Part II	Section 6 - Employer's requirement	Page 6-125	Chapter 16.15.9	<p>With reference to Chapter 16.15.9 of Section 6 Employer's requirement, we understand that the Contractor shall be responsible to supply an additional office space in the admin building equip with two computer workstations, each with SWRO Desalination Plant Control System/ SCADA access. Such computer shall be password protected with no ability to control or change process set points. Such workstation shall be in addition to the operator workstations as required in Chapter 13.1 of Section 6.</p> <p>Please kindly confirm</p>	Confirmed. The provision in the Sub Clause 16.15.9 in Chapter 16 of Section 6 is only for Employer's Representative.
66.	01-06-03	Part I	Section 2- Bid Data Sheet	Page 2-4	ITB 18.4 (a) (i) ITB 18.4 (b) (i)	<p>As per ITB 18.4 (a) (i) and ITB 18.4 (b) (i), the equipment listed in Schedule No 1 shall be quoted in CIP basis and the equipment list in Schedule No 2 shall be quoted in EXW basis. Transportation from port of destination (for imported equipment) and manufacturer's factory within Sri Lanka (for local equipment) are excluded from Price Schedule No.1 and Price Schedule No.2 respectively.</p> <p>Kindly advise if such transportation cost shall be included under the respective item in Schedule 4.2.</p> <p>Please kindly confirm.</p>	All cost involving to supply the plant, mandatory spare parts and materials to site (Thalayadi) shall include to Price Schedule 1 & 2.
67.	01-06-04	Part II	Section 6 - Employer's requirement	Page 6-146/147	A.3.2 Standard for effluent disposal A 3.3 Standard for solid waste disposal	<p>The attachment 3.2 Standard for effluent disposal and attachment 3.3 Standard for solid waste disposal of Section 6 Employer's requirement are missing out in the ITB document.</p> <p>Please kindly provide.</p>	Refer Revised Bidding Document: Section 6: ERQ : Attachments; A.3.2 Standard for effluent disposal: CEA standards as mentioned in Table 2-5, Chapter 2. A.3.3 Standard for solid waste disposal: Shall comply with the Authority standards and recommendations in EMP.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
68.	01-07-01	Part I	Section 4 - Bidding Forms	Page 6-68	Price Schedule Preamble Chapter 5.2 Contractor's Variable Rate	<p>As per the requirement in Chapter 5.2 Contractor's Variable Rate, the Contractor shall pay the damages if the assessed leakage in the transmission main between the plant and monitoring station at "Puthukkadu Junction".</p> <p>We understand that the said monitoring station at "Puthukkadu Junction" is excluded from Contractor's scope under this Contract.</p> <p>Please kindly confirm.</p>	Refer Revised Bidding Document: Section 4: BDF : Preamble - Subclause 5.2
69.	01-07-02	Part II	Section 6- Employer's requirement	Page 6-26	Chapter 2.1.2.1	<p>As per Chapter 2.1.2.1 Algal Bloom/ Red Tide Events in Section 6 Employer's requirement, the algae bloom/red tide event will occur in the summer.</p> <p>Please kindly advise the duration (i.e days/year) of algae bloom/ red tide event occurred each year.</p>	Refer Revised Bidding Document: Section 6: ERQ: Chapter 2.1.2.1
70.	01-07-03	Part II	Section 6- Employer's requirement	Page 6-92	Chapter 11.1.2	<p>As per the laboratory requirement in Chapter 11.1.2 of Section 6, the laboratory shall be equipped with the required instruments/ apparatus and glassware for the purpose of carrying out the required test during the operation of the plant.</p> <p>We understand that the laboratory in the plant shall be equipped with instruments/apparatus capable of performing the required test for all listed parameter under Attachment 3 of Section 6. Please kindly confirm.</p>	Refer Revised Bidding Document; Section 6: ERQ: Chapter 16 – Sub Clause 16.14.2.
71.	01-07-04	Part II	Section 6- Employer's requirement	Page 6-123	Chapter 16.14.5	<p>During operation service period, please advise us the daily/weekly/monthly sampling and analysis requirement including which parameters that will be analyse on daily/weekly/monthly basis.</p> <p>Please kindly suggest the frequency for above said water parameter testing.</p>	Refer Revised Bidding Document; Section 6: ERQ: Chapter 16 – Sub Clause 16.14.2.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
72.	01-07-05	Part I	Section 4	Page 4-13	i) Chapter 2.1.1	<p>As per the method statement requirement, the bidder shall propose the details of approved location where the solid waste to be disposed off.</p> <p>We understand that the above said approved location shall be recommended by the Employer. Please kindly confirm the location for the solid waste to be disposed off.</p>	Refer Revised Bidding Document: Section 6: ERQ: Attachment for EMP.
73.	01-07-06	Part III Preamble to Price Schedule	Section 9 Section 4	Page 9-13 Page 4-68	3)Appendix 2 D.3	<p>Based on item 3) of Appendix 2, the Contractor's electricity payment shall be no indexation adjustment. We understand that Schedule 5.3 shall be reimbursable based on actual cost paid to CEB plus overhead as set out in Sub-clause 1.1.24, Section 8-PCC.</p> <p>Please kindly confirm.</p>	Actual cost only shall be paid
74.	01-08-01	Part I	Section 2 - Bid Data sheet	Page 2-6	ITB 21.1	<p>As per bid bond requirement in ITB 21.1 of Section 2, the bid bond can be issued by a bank outside of Sri Lanka as long as the issue bank has a correspondent bank in Sri Lanka and the bid security shall be enforceable in Sri Lanka. We understand that only a notification of bid bond by the correspondent bank in Sri Lanka need to be provided, if the bid bond is issued by a bank outside of Sri Lanka.</p> <p>Please kindly confirm if our understanding is correct.</p>	The correspondent bank in Sri Lanka has to guarantee the Bid Security which is issued by the bank outside of Sri Lanka.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
75.	01-09-01	Part III	Section 8 - Particular Conditions of Contract	Page 8-12	Sub-clause 5.1	<p>As per Sub-Clause 5.1 of Section 8 Particular Conditions of Contract, the site measurement and other data furnished by the Employer and drawings are approximate and provided for the information of Contractor to make his own interpretations.</p> <p>We understand that this Sub-Clause specifically refers to drawing of treatment plant in Attachment 2.1 a of Section 6- Employer's Requirement. The actual site measurement and coordination shall need to be measured and verified jointly by the Contractor and Employer prior to Commencement Date.</p> <p>Please kindly confirm if our understand is correct.</p>	<p>This clause refers all the site measurement and other data furnished by the Employer and drawings are approximate and provided for the information of Contractor to make his own interpretations.</p>
76.	01-09-02	Part III	Section 7 General Conditions of Contract	Page 32	Sub-Clause 8.1	<p>We understand that the project will be commenced at the date which the following precedent conditions have all been fulfilled and the Engineer's notification recording the agreement of both Parties on such fulfilment and instructing to commence the Work is received by the Contractor:</p> <p>(a) signature of the Contract Agreement by both Parties, and if required, approval of the Contract by relevant authorities of the Country;</p> <p>(b) delivery to the Contractor of reasonable evidence of the Employer's Financial arrangements (under Sub-Clause 2.4 [Employer's Financial Arrangements]);</p> <p>(c) except if otherwise specified in the Contract Data, effective access to and possession of the Site given to the Contractor together with such permission(s) under (a) of Sub-Clause 1.14 [Compliance with Laws] as required for the commencement of the Works;</p> <p>(d) receipt by the Contractor of the Advance Payment under Sub-Clause 14.2 [Advance Payment] provided that the corresponding bank guarantee has been delivered by the Contractor.</p> <p>Please kindly confirm.</p>	<p>The Contract stands as it is. Refer Revised Bidding Document: Section 7: GCC The General Conditions shall be the Conditions of Contract for Design, Build and Operate Projects (Gold Book) prepared by the Fédération Internationale des Ingénieurs-Conseil, (FIDIC) First Edition 2008, copyrights of which are held by FIDIC.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
77.	01-09-03	Part II	specifications for motor driven self lubricated vertical turbine pumping sets and accessories	Page 6	Chapter 1.6.5	<p>As per motor test requirement in Specifications for motor driven self lubricated vertical turbine pumping sets and accessories, Motor shall be tested in accordance with NEMA and IEEE Procedures.</p> <p>Please kindly confirm if the motor can be tested accordance with IEC standard or other equivalent standard.</p>	The Contact stands as it is.
78.	01-09-04	Part II	Section 6 Employer's requirement	Page 6-121	chapter 16.14.1 Flow meter accuracy and calibration Frequency	<p>As per flow meter accuracy and calibration frequency requirement in Chapter 16.14.1 of Section 6, the accuracy of the flowmeters shall be less than 0.3% and the flowmeters shall be calibrated once every six (6)months.</p> <p>Please confirm if the term calibration refers to electronic calibration of the 4-20mA signal at the flow meter transmitter which shall be done by a competent entity or manufacturer's authorised agent.</p>	The calibration shall be carried out as recommend by the manufacturer where the meter has been installed in accordance with the manufacturer's recommendations.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
79.	1	Part I	Section 4 - Bidding Forms	Page 4-78	Schedule 5, 6	<p>We understand that replacement of short lived asset including maintenance parts in price schedule 5 and replacement of asset (i.e replacement of membranes) listed in price schedule 6 will be imported under the name of Contractor (i.e. consignee name shall be the Contractor) and any duties, custom dues, port charges shall be paid by the Contractor and included in the selling price of Schedule 5 and 6.</p> <p>However, any VAT payable (if required) shall be charged to the Employer in addition to the Contract Price and shall be paid by the Employer separately as addition to the listed price in Schedule 7. The amount entered to Schedule 5 and 6 shall be excluded VAT.</p> <p>Please kindly confirm if our understanding is correct.</p>	<p>Refer Revised Bidding Document; Section 4: BDF: Price Schedules The Mandatory Spare Parts including O & M spares that have less than five years asset life shall be listed in Price Schedule 1 and 2. The asset life more than five years shall be listed in Price Schedule 6.</p> <p>The Employer will pay all customs duties and other taxes, which includes VAT levied by the Sri Lanka Customs on importing Items in Price Schedule 1 and 6. However the Contractor shall initially pay such duties and taxes for speedy clearance from the port of importation, which shall then be reimbursed by the Employer on submission of original customs clearance documents/receipts.</p> <p>The Contractor shall add VAT to its applications for payment and the Employer would pay the taxes including VAT. The Contractor shall pay VAT to government in accordance with normal Sri Lankan tax practice.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
80.	2	Part I	Section 4 - Bidding Forms	Page 4-82	Schedule 6	<p>With reference to the listed item in price schedule 6 : Asset Replacement Fund as attached to Section 4 - Bidding Forms, we understand that all asset expected to be replace in year 5, 6 and 7 during the Operation Service Period shall be priced in Schedule 6. This include replacement of RO membranes. This would meant that plant and material which have life expectancy of more than 4 years (i.e year 1 to 4) shall be listed under Schedule 6 where any replacement of such from year 5 to year 6 shall be claimed under this schedule following the replacement of listed schedules items. As such we can understand that replacement of Items listed here earlier than year 5 (i.e replacement from year 1 to year 4), Contractor cannot claim for payment under Schedule 6 and to be consider as part of Contractor's fixed fee during Operation Period.</p> <p>Please kindly confirm if our understanding is correct.</p>	<p>Refer Revised Bidding Document; Section 4: BDF: Price Schedules The Mandatory Spare Parts including O & M spares that have less than five years asset life shall be listed in Price Schedule 1 and 2. The asset life more than five years shall be listed in Price Schedule 6.</p>
81.	02-01-01	Part-I,	Section 3	3-10 & 3-11	Experience in key activities & Subcontractors	<p>Please clarify if a bidder possesses the qualifications as mentioned in the table on page 3-10, will he also have to mandatorily demonstrate the qualification of its sub-contractors as specified in clause 2.5?</p>	<p>Table 2.4.2: Here the past experience of the Bidder in key activities are requested. Tale 2.5: Here the required experience of the proposed sub-contractor for proposed work is requested.</p>
82.	02-01-02	Part-I,	Section 3	3-8 & 3-9,3-10,3-11	Bidders and or subcontractor experience to be considered within last 10 years & within last 5 years	<p>Kindly advise, if the last 10 years / 5 years are counted from the date of Notification of tender.</p>	<p>The last 10 years / 5 years are counted from the date of Notification of tender. i.e. from 07th December 2016.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
83.	02-01-03	Part-II,	Section 6	6-14 & 6-71	1.3.2 – Pre-treatment system iii) Alternative pre-treatment systems	As per existing clause, a bidder may choose any pre-treatment system as specified in the table, if he is able prove that alternate system saves substantial amount as specified in clause. Kindly clarify, if a bidder can also propose any other proven pre-treatment system, successfully installed in other SWRO plant in world which also saves the substantial amount to employer.	In the revised Bidding Document the bidder is as asked to design the pre-treatment system within certain constraints. The Bidder is to use its experience to design a robust pre-treatment system that will satisfy the membrane supplier's requirements and at the same time operate efficiently.
84.	02-01-04	Part-II,	Section 6	6-25	Table 2-1,2-2, Intake - Source Water Quality	Underwater fresh water spring may exist close to the intake. Having a lower salinity for treatment would result in substantial savings for NWSDB. At present, plant design must be done for imposed salinity which may not reflect reality. It is suggested that raw water quality definition be the responsibility of the bidder. Please confirm if it is acceptable.	Determining the raw water quality is the sole responsibility of the Bidder. The raw water quality given in Tables 2-1 and 2-2 of Section 6 reflect what the employer knows of the seawater quality at the location of the proposed intake. In designing the treatment system the Contractor is required to satisfy itself of the raw water quality.
85.	02-01-05					It is proposed that with reference to the raw water quality definition passed on to the bidder, the definition of membranes (type, size, flux, quantities...) and other design criteria such as but not limited to recovery rates, pumps efficiency, energy recovery system, be the responsibility of the bidder. Please confirm if it is acceptable	The design is the full responsibility of the Bidder.
86.	02-02-01	Bidding Document, Part-II & Attachment-3	Section-6	6-8	A.3.2 & A.3.3	Files for the following standards under Attachment -3 are missing in the CD-ROM received by us : <ul style="list-style-type: none"> • A.3.2 Standard for Effluent Disposal • A.3.3 Standards for Solid Waste Disposal Kindly reissue the CD ROM complete with all the Files.	Refer Revised Bidding Document: Section 6: ERQ : Attachments; A.3.2 Standard for effluent disposal: CEA standards as mentioned in Table 2-5, Chapter 2. A.3.3 Standard for solid waste disposal: Shall comply with the Authority standards and recommendations in EMP.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
87.	02-02-02	Part-I	Section-1	1-11	18.1	Kindly provide the list of the Permits, Approvals and Licenses required to be obtained in this Contract, typical Fees and Time required to obtain them. This information is required in the preparation of Project Execution Schedule.	The Approvals to be obtained; 1. Building Approval – One month / Employer will process. 2. RDA approval – one month / provision included under Provisional Sum 3. CEA/ CCD/ MEPA approval – already obtained for construction. After successful commission, Operation License to be obtained and this shall be responsible of the bidder. The Bidder also shall conduct his own research into the regulatory requirements for the plant.
88.	02-02-03	Part-I	Section-1	1-11	18.1	Kindly confirm the following : - Building permit (time to get it, documents to be produced, can we start some preliminary works before obtaining it...) - Environmental permit (ditto) - Pre-requisites to start temporary site installation, earthworks, and construction works? - Any special authorizations required to access the construction site and for demolishing any existing facilities or trees ?	The Approvals to be obtained; 4. Building Approval – One month / Employer will process. 5. RDA approval – one month / provision included under Provisional Sum 6. CEA/ CCD/ MEPA approval – already obtained for construction. After successful commission, Operation License to be obtained and this shall be responsible of the bidder. The Bidder also shall conduct his own research into the regulatory requirements for the plant.
89.	02-02-04	Bidding Document, Part-I	Section-4	4-76	Schedule 4.3	We understand that the cost of all Permits, Approvals and Licenses are included in Schedule 4.3 (Provisional Sum). Kindly confirm or clarify.	The provision for permits and approvals are mentioned in Section4: Schedule 4.3 Refer Revised Bidding Document: Section 4: BDF
90.	02-02-05	Part-I	Section-4	4-81	Sch. 5.3	Please provide CEB Tariff rates (LKR/kWh) to be considered.	Refer Revised Bidding Document: Section 4: BDF; Price Schedule 5.3.1, 5.3.2 and 5.3.3.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
91.	02-02-06	Bidding Document, Part-I Vol-2	Section-4	4-65	Letter of Price Bid	Since the Employer's evaluation of the Bid shall not take into account taxes and duties applicable in the Employer's Country, we understand that the Total Price from Price Schedule no. 7 (Grand Summary) to be written in the Letter of Price Bid shall be exclude the total amount under the column "Custom Duties, Taxes and VAT". Kindly review and confirm.	Confirmed.
92.	02-02-07	Part-I	Section-2	2-5	BDS-ITB 19.1 (a)	We understand "Bidders home country" is to be read as "Employer's home country". Please clarify and confirm.	Refer Revised Bidding Document: Section 2: BDS: ITB 19.1
93.	02-02-08	Bidding Document, Part-I	Section-3	3-8	2.4 (Bidder's Experience)	<p>The specified minimum number of Contracts and the specific criteria listed under 2.4.1 (a), 2.4.1 (b), 2.4.1 (c) are adequate to establish Bidder's strong credentials for the required experience in Contracts of similar size and nature.</p> <p>Further adding "similar to the design and Build portion of the proposed Works" would imply that all the reference Contracts are to be an exact replica of the Employer's Requirement in Jaffna Desal Contract (as per Section 6, Cl 1.3), and hence impossible to be proven. Hence, we request the line "similar to the Design and Build portion of the proposed Works" should be removed from these clause. Kindly review and confirm.</p>	Refer Revised Bidding Document: Section 3: EQC: 2.4 - Bidder's Experience
94.	02-02-09	Bidding Document, Part-I	Section-4	4-12	Method Statement 2.1.1 h) iv	Bidder can-not predict the " <u>future sea level rise due to climate change</u> ". Kindly delete this Method Statement requirement, or advise how the Bidder would comply. Please confirm.	Refer Revised Bidding Document: Section 4: BDF: 2. Method Statement

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95.	02-02-10	Bidding Document, Part-I	Section-4, Section-6	4-14, 6-13, 6-71	Pre-treatment System (2.1.3, 1.3.2, 6.1.4)	It is a DBO contract with 7 years long comprehensive O&M Responsibility which is a long enough duration to establish the reliability of the Plant. In addition, the Employer specified strong Prequalification criteria to establish the experience and expertise of the Bidder. Hence, in order to receive the most optimum and proven plant design from such Bidders, the Bidder should be allowed to propose the Pre-treatment of his choice and expertise i.e. either the Base Case Pre-treatment, or one of the 4 example configurations presented in Table 6-1, or any other pre-treatment designed and operated successfully. Kindly confirm.	Refer Revised Bidding Document: Section 6: ERQ- Chapter 6 – Pre-treatment.
96.	02-02-11	Bidding Document, Part-I	Section-4	4-23	2.1.12 (List of Mandatory Spare Parts for Retention Period)	Since the Contractor shall be responsible for the Commissioning and the comprehensive Operation and Maintenance the Plant which will be concurrent with the Retention Period, there is no use of any specific List of Mandatory Spare Parts. Hence, we request this requirement may be removed bid deliverables. Kindly confirm.	Refer Revised Bidding Document: Section 4: BDF- Price Schedule 6 Section 6: ERQ- Chapter 1 – 1.7
97.	02-02-12	Bidding Document, Part-I	Section-3	3-8, 3-11	2.4 (Bidder's Experience), 2.5 (Subcontractor)	We understand that 10 years / 5 years criteria is counted from the date of Notification of Tender, which is 7 th December 2016. Please confirm.	Confirmed.
98.	02-02-13	Bidding Document, Part III	Section-8	8-11	4.14 (Avoidance of Interference)	We request the deletion of the statement "(including consequential damages)". Kindly confirm.	The Contract stand as it is.
99.	02-02-14	Bidding Document, Part III	Section-8	8-3	10.6 (b) Maximum Compensation Payable by Employer.	Kindly consider "10% of the accepted contract amount for operation service. as the Maximum Compensation Payable by Employer. Kindly confirm.	The Contract stand as it is.

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100.	02-02-15	Bidding Document, Part-I & Part-II	Section-4 Section-6	4-5 6-10	Form AT1-LTB (S. No. 2) 1.2.1	The required 96% Plant Production Capacity Availability Factor for SWRO Desalination plant is very stringent and shall lead to over design and high Capex. We recommend 93% Availability Factor as per the Industry Norm which is also in line with the Bidder's Experience requirement criteria no. 3 in cl. 2.4.1 (c). Please confirm.	Refer Revised Bidding Document: Section 6: ERQ: Chapter 1 – 1.2.1
101.	02-02-16	Bidding Document, Part-II	Section-6	6-104	Table 15.1 & Cl. 15.4	Energy Guarantee specified as 3.8 kWh/m ³ In Table 15.1, and specified as 3.5 kWh/m ³ in cl 15.4 are contradictory. Please confirm the value to be considered.	Energy Guarantee is 3.8 kWh/m ³ .
102.	02-02-17		Section-6	6-27	Table 2-3 (Pre-treatment Filtrate Water Quality)	As per our design and O&M Experience in several SWRO plants around the world, the tender specified minimum pre-treatment filtrate water quality requirements in terms of Turbidity and SDI is unduly stringent, which shall force a very conservative and expensive design, high operating cost and reduced Plant Availability Factor. The SWRO Membrane Suppliers typically accepts upto 1 NTU Turbidity, and upto 5 SDI ₁₅ . In order to optimise the design and have enough robustness, we recommend the following : <ul style="list-style-type: none"> • Turbidity : < 0.5 NTU (90%ile), Max. 1 NTU • SDI₁₅ : < 4 (90%ile), Max. 5) Kindly review and confirm.	Refer Revised Bidding Document: Section 6: ERQ: Chapter 2 – Tale 2.3.
103.	02-02-18	Bidding Document, Part-II	Section-6	6-104	Cl. 15.4 and Table 15.1	The specified maximum value of Energy / Power Use Guarantee are very low. We understand that the Energy / Power Use Guarantee excludes the electrical energy requirement for Sea Water intake System, Potable Water Storage and Conveyance Facility, HVAC, and all Building and Area Lighting. Kindly confirm.	The "Energy – SWRO Plant - 3.8 kWh/m ³ [or lower amount as proposed by bidder]" in the Table 15.1 refers to the average daily power consumption to produce 24 MLD of potable water from sea water. It does not include the power for other site activities including the administration or residential areas, site lighting or the potable water pumping station.

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104.	02-02-19	Bidding Document, Part-II	Section-6	6-27	2.1.2.3	Kindly provide 100 year Flood Data as a common basis for all the Bidder to comply with the tender requirement that the contractor shall also include all the required cost to design and build all key equipment and facilities at elevation of a minimum of 0.3 meters above the general site levels or the 100-year flood line whichever is 20higher. Kindly confirm.	Finished floors of all buildings shall be a minimum 300 mm (0.3 meters) above the maximum existing ground elevation of SWRO plant site.
105.	02-02-20	Bidding Document, Part-II	Section-6, Annexure-4	1/3	A.4.1	Construction time of 16 months (i.e. approx.. 486 days) is contradicting 910 days completion duration of Design-Build specified in the Contract Data. Kindly clarify.	Refer Revised Bidding Document: Section 6: ERQ: A.4.1 Section 9: COF: Appendix 3
106.	02-02-21	Bidding Document, Part-II	Section-6, Attachment-II	176	Table 9.1 item No_2.0	In the clause it has been mentioned that the vertical migration structure on columns designed to withstand for tsunami be designed and provided. Kindly provide the typical drawing for this type of structure and introduce a line/row in schedule 4.3 provisional sums to cost for it and add contractor's overhead and profit on the same. Kindly confirm.	Refer Revised Bidding Document: Section 6: Attachment 2 – A.2.8
107.	02-02-22	Bidding Document, Part-II	Section-6, Attachment-II	186	Table 9.1 item No_21.0	The Contractor has to rehabilitate the existing road network for which he has to allocate approximately Rs. 2,000,000 per every km. However, this does not include replacement of culverts. If culverts are to be replaced an additional sum is required. The Contractor is advised to pay a site visit in order to allocate provisional sum to this item. 2We request, to provide the typical details/sections of road and culverts to be rehabilitated and introduce a line/row in schedule 4.3 provisional sums to cost for it and add contractor's overhead and profit on the same.	Refer Revised Bidding Document: Section 6: ERQ: Attachment 2: A.2.8: Table 9.1 replaced with the Environmental Consideration.

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108.	02-02-23	Bidding Document, Part-II	Section-6	6-31	3.2	<p>In this clause it is mentioned that, removal and/or relocation of existing above and underground structures, piping and other facilities, equipment, debris, vegetation and other physical obstacles to execution of project construction located at the site designated by the Employer for the' 24 MLD SWRO desalination plant and or any construction water and other services supply routes;</p> <p>However, in the same document Chapter No. 4 SWRO DESALINATION PLANT LAYOUT in clause No. 4.1 it is mentioned that in preparation of their bid, the contractor shall assume that the new site has no existing surface or subsurface facilities, structures, buildings and piping which will need to be removed or relocated. Kindly clarify the conflict in the two statements and confirm which one to follow.</p>	The SWRO Plant site has no existing surface or subsurface facilities, structures, buildings and piping which will need to be removed or relocated.
109.	02-02-24	Bidding Document, Part-II	Section-6	6-83	9.1	The connection at the water delivery point shall be carried out via no - dig or trenchless method. Please provide the length/detail of trenchless to be done.	Refer Revised Bidding Document: Section 6: ERQ: Chapter 9 Table 9.1
110.	02-02-25	Bidding Document, Part-II	Section-6	6-101	14.1.2	Please provide 'Power Flow Diagram' of the Electrical Supply Distribution for clarity/ understanding to the bidders.	This is a responsibility of the Contractor.
111.	02-02-26	Bidding Document	-	-	-	Please provide Technical Specifications for Electrical, Instruments, Control & Automation System.	The Contractor shall follow the standards given in Revised Bidding Document.
112.	02-02-27	Bidding Document	-	-	-	Please provide 'System Architecture' of the Automation system for clarity / understanding to the bidders.	This is a responsibility of the Contractor.

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113.	02-02-28	Bidding Document	A-1	-	-	Due to innovations and competition, the electronic systems like PLC–Series Hardware, Instruments are regularly upgraded by the Manufacturers with better specifications/performance. Hence, with every passing year, it is difficult to arrange necessary supports from the Manufacturer of the supplied System in terms of spares and consumables. We recommend minimum expectancy of 10 years should be allowed, instead of tender specified 20 years. Kindly confirm.	Confirmed. Refer Revised Bidding Document: Section 6: ERQ: Attachment 1
114.	02-03-01					<p>-Bidder's experience. The civil work portion of this project will be more than 50%. It make sense to form a JV with a civil work company but clause 2.4.1 c) imposes that each partner of a JV has one O&M reference in SWRO. Civil work companies are usually never involved in O&M and consequently no one can meet this requirement. We suggest that this O&M reference applies to One Partner instead of to Each Partner.</p> <p>-For the same reason of civil work companies' lack of interest in O&M, we would like the tender documents to allow for the change of status of the JV after the plant acceptance (end of DB or DLP) so that the civil work partner of the JV be able to step out of the JV, the remaining partner(s) taking full responsibility for process and civil work structures</p> <p>-Regarding timing, we believe that it is possible to start supplying 6MLD of water 4 months ahead of the 910 days presently considered for the plant acceptance. As explained above, we haven't yet been able to find the right organization to handle the civil work portion due to the too stringent conditions of the tender document and consequently we request a two months' time extension for bidding. We understand the urgency of the project but as 6MLD can be produced 4 months ahead of schedule, we hope this time extension for bidding will be granted. Full plant acceptance should remain at 910 days.</p> <p>-Concerning the pre-treatment design, there is a mandatory Base Case with DAF+UF. It is also said in the Tender that alternate solutions to the Base Case can be proposed but the Base Case must still be offered first and it will be evaluated first. As it is a DBO Tender, with very strong PQ conditions, we think each of the bidder would be able to add value to</p>	Refer Revised Bidding Document; Section 3: EQC Section 6: ERQ – Chapter 6
115.	02-04-01	Bidding Document,	Section 2	2-3	ITB 16.1 (b)	The Project is a DBO with 7 years O&M – What do you mean by “ The period following commissioning of works in accordance with provisions of the contract shall be 15 years? Is there any possibility for an O&M Extension?	Refer Revised Bidding Document; Section 2: BDS: ITB 16.1 (b)

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116.	02-04-02	Bidding Document	Section 2	2-4	ITB 18.4 (a) (ii)	<p>"Bidders shall note that the General Conditions of Contract (GCC 14.1) provides that the Employer would pay the actual customs duties and other taxes including VAT payable on the importable items in Price Schedule 1." That mean that it considers the Spare parts Abroad – Does it apply to the O&M period for the foreign material costs.</p>	<p>Refer Revised Bidding Document; Section 4: BDF: Price Schedules The Mandatory Spare Parts including O & M spares that have less than five years asset life shall be listed in Price Schedule 1 and 2. The asset life more than five years shall be listed in Price Schedule 6.</p> <p>The Employer will pay all customs duties and other taxes, which includes VAT levied by the Sri Lanka Customs on importing Items in Price Schedule 1 and 6. However the Contractor shall initially pay such duties and taxes for speedy clearance from the port of importation, which shall then be reimbursed by the Employer on submission of original customs clearance documents/receipts. The Contractor shall add VAT to its applications for payment and the Employer would pay the taxes including VAT. The Contractor shall pay VAT to government in accordance with normal Sri Lankan tax practice.</p>
117.	02-04-03	Bidding Document, Part-II	Section 6	6-36	8.1	Can you explain the detailed requirement's for the "One-Year Engineering Support to Employer operation Service Contract - Personnel - Operation Service - Chemicals - Insurance - Membranes - Operation Licenses/Full Operation and ISO Standard for the Pant"	Refer Revised Bidding Document; Section 6: ERQ: Chapter 16 and 17
118.	02-04-04	Bidding Document, Part-II	Section 9	9-13	9-13-3	<p>For Price Schedule 5.3 - Operation Service: "Contractor's Electricity payment .No indexation adjustment shall be made." High Lift pumps energy consumptions are in the Contractor's scope. If there is any change of the energy cost, the price should be actualized. Please confirm.</p>	Actual Energy cost shall be paid.

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119.	02-04-05	Bidding Document, Part-II	Section-6	6-67	Cl. 5.3.2	We believe that the requested design of the intake pumping station is not to the advantage of NWSDB. Would it be possible to leave the intake pump design open to the selection of the tenderer as long as this tenderer can prove that the proposed solution has been designed, built and operated successfully in the past on other full scale seawater projects of similar nature.	The Contract stand as it is.
120.	02-04-06	Bidding Document, Part-II	Section-6	6-67	Cl. 5.3.1	We believe that the requested design of the intake pumping station is not to the advantage of NWSDB . Would it be possible to have the mechanical screening downstream of the Intake pump station if this configuration has been designed and operated successfully in the past at other full scale seawater projects?	The Contract stand as it is.
121.	02-04-07	Bidding Document, Part-II	Section-6	6-70	6.1.4 ,Table 6-1 Pre-treatment System and maximum loading rates	We believe that the requested design of the pre-treatment is not to the advantage of NWSDB. It is not logical to impose the same design limits to open sand filters and pressure sand filters. In the pre-treatment system No.2, stage 2 would it be possible to increase the N-2 loading requirement to 16m3/m2/hr for pressure sand filters.	Refer Revised Bidding Document; Section 6: ERQ: Chapter 6, Chapter 2- Table 2-3
122.	02-04-08	Bidding Document, Part-II	Section-6	6-14	1.3.3 (k)	Generally HVAC (Heat Ventilation & Air Conditioning) is not needed in the SWRO building; Please confirm it can be deleted if the tenderer can demonstrate that in similar type of plant and size in similar hot climate such as Middle East it was not installed. This will substantially reduce the electricity consumption of the plant for the benefit of NWSDB and without any negative impact on the O&M staff.	Agreed. Design is Contractors responsibility.

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123.	02-04-09	Bidding Document, Part-II	Section 6	6-104	Table 15.1 CI 15.4	Please confirm the correct value to be guaranteed as there is a contradiction between Table 15.1 : where it states should not exceed 3,8kWh/m ³ guarantee and in the clause 15.4 mentions should not exceed 3,5kWh/m ³	Energy Guarantee is 3.8 kWh/m ³ [or lower amount as proposed by bidder]"
124.	02-04-10	Bidding Document, Part-II	Section 6	6-27	Table 2-3	The SDI value required is typical for an UF pre-treatment system but if other pre-treatment systems used for example sand filtration this value would be SDI15 : < 4 (90%ile), Max. 5). Please modify table accordingly.	Refer Revised Bidding Document; Section 6: ERQ: Chapter 6, Chapter 2- Table 2-3
125.	02-04-11	Bidding Document, Part-II	Section 4	4-37		9. Manufacturers Authorisation, reference is made to clause 27 of General conditions of contract. Please provide the mentioned clause	Refer Revised Bidding Document; Section 4: BDF: 9. Manufacturers Authorisation
126.	02-04-12	Bidding Document, Part-II	Section 6	6-124	16.15.4	The Contractor must perform the Operation Service to ensure the Specific Energy Consumption is less than 3.8 kWh/m ³ of Water Supply at all times during-the Term. Please confirm the value design is 3.8kWh/m ³ and not 3.5 for the total RO Plant. In 15.4 Power Use Guarantee	Energy Guarantee is 3.8 kWh/m ³ [or lower amount as proposed by bidder]"
127.	02-04-13	Bidding Document	Section 6.	6-93	Chapter 11. Clause 11.1.3	Where is the circuit Bungalow with 4 rooms would it be located?	Within the SWRO plant site.
128.	02-04-14	Bidding Document	Section 6	6 -83	CI 9.1	Can the material selection of the concerned works which is design dependent, be left up to the discretion of the tenderer as long as it is supported by reference plants of similar nature.	The Contract stand as it is. Refer Revised Bidding Document; Section 6: ERQ: Chapter 9.1

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129.	03-01-01	1	6	79		<p>Could you please provide the intake and outfall profile in DWG format (as per attachment taken from the appendix A.2.4 page 79) including:-</p> <ul style="list-style-type: none"> - The Chart datum (hydrographic level = 0) - The mean sea level in relation to Chart datum (hydrographic level = 0) <p>The highest and lowest tide level</p>	Refer Revised Bidding Document; Section 6: ERQ – Chapter 6 Attachment A.2.4
130.	03-01-02	1	6	35		In section 6 page 35 potable water parameters are given as maximum values, please provide minimum value or average value.	Refer Revised Bidding Document; Section 6: ERQ – Chapter 2- Table 2.4
131.	03-01-03	1	6	12		Section 6 – page 14 1.3.2. Pre-treatment. If bidder may offer an alternate pre-treatment system...Please clarify how the alternative pre-treatment will be included in the proposal. (different project, optional solution)	Refer Revised Bidding Document; Section 6: ERQ – Chapter 6
132.	03-01-04	1	6	29		Section 6 – page 29. Plant recovery 45%, taking into account pre-treatment water losses recovery at RO plant should be higher. Can the bidder propose its own design with a different overall recovery (higher or lower)?	The recovery 45% refers to the RO membranes.
133.	03-01-05	1	6	98		Section 6 – page 98 indicates that membrane flux for the SWRO shall not exceed 14 lmh with 4 trains in operation and 16 lmh with 3 trains in operation. Please confirm if bidder has to follow both requirements, or only the 14 lmh.	The average design SWRO membrane flux of the SWRO elements per pressure vessel shall not exceed 14 Lmh with all four RO trains in operation and RO train production capacity of 250 m3/hr. Refer Revised Bidding Document; Section 6:ERQ: Chapter 7.2.2 (e)
134.	03-01-06	1	6	101		Section 6 page 101 indicates that train permeate flow shall be controlled by varying the speed of the high pressure feed pump to achieve the selected permeate flow set point. Please indicate if other flow set point has to be considered apart from 6+12+18+24 MLD	The plant is required to operate at potable water production rates of 6, 12, 18 and 24 MLD.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
135.	03-01-07	1	6	101		Section 6 page 101 indicates that train permeate flow shall be controlled by varying the speed of the high pressure feed pump to achieve the selected permeate flow set point. Please clarify whether bidder can decide to install VFD in high pressure pump or not	It is the responsibility of the contractor to design the RO high pressure pumping system.
136.	03-01-08	1	6	133		Section 6 page 133 schedule of guarantees states that energy consumption should be 3.8 kwh/m ³ or lower, however in point 15.4 it is said that during testing period power consumption should be 3.5kwh/m ³ excluding potable water pumps and HVAC and area lifting. Does the value 3.8kwh/m ³ include potable water pumps and HVAC and area lifting? Or is it for the longer term O&M contract (considering fouled membranes, etc.). Please clarify	The "Energy – SWRO Plant - 3.8 kWh/m ³ [or lower amount as proposed by bidder]" in the Table 15.1 refers to the average daily power consumption to produce 24 MLD of potable water from sea water. It does not include the power for other site activities including the administration or residential areas, site lighting or the potable water pumping station.
137.	03-01-09	1	6	33		Section 6 – page 33. New structures to be located at least 300 away from the shore. Please indicate if seawater intake pump has to be located 300 meters away from the shore line too.	The seawater intake pump station shall be located within the treatment plant site.
138.	03-01-10					What seismic (earthquake) zone applies to the project?	Sri Lanka is relatively free of seismic activity. Only what is the building codes need be applied.
139.	03-02-01	Secti on 4	4A	24 4- 22	2.1.11	A second source of power supply is mentioned in the related clause. Kindly clarify if two different power supplies from CEB have been foreseen to feed the desalination plant.	Primary source of supply from the CEB and a backup supply from an onsite generator for emergencies. Refer Revised Document; Section 6 :ERQ- Chapter 14
140.	03-02-02		6	130	14.1.1	Kindly provide the location of the connection point to the high-voltage power supply system of Ceylon Electricity Board.	Refer Revised Bidding Document; Section 6: ERQ- Attachment A.2.5 (The tentative location is marked as "A" at the boundary of the SWRO plant site.

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141.	03-02-03		6	130	14.1.2	Please clarify if a redundant electrical system (transformers, switchgears) is required for the Desalination Plant	The Plant is to achieve a reliability of 96% and the Contractor is to ensure this in its design by incorporating sufficient and reasonable backup systems having regard to the cost and the likelihoods of failure, and the availability of spares.
142.	03-02-04		6	130	14.1.2	Please inform of the maximum rating for low voltage motors	Refer Revised Bidding Document; Section 6: ERQ: Chapter 14
143.	03-02-05		6	114	10.4	"The solids waste generated at the plant site will include spent cartridge filters; and spent SWRO membranes. If membrane pre-treatment is used, the plant will not have cartridge filters but will have MF or UF membranes." Please clarify if cartridge filters have to be installed if UF or MF membranes are installed.	Refer Revised Bidding Document; Section 6: ERQ – Chapter 6

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144.	03-02-06	Evaluation and Qualification Criteria	3	6 to 12	2.3 and 2.4	<p>Financial requirements and Bidder's experience</p> <p>The Evaluation and Qualification Criteria state that, in case of a Joint-Venture, each partner must meet the following requirements related to Bidder's experience: design, build & operate during 7 years of several SWRO plants of similar sizes within the last 10 years, inside and outside the Bidder's country.</p> <p>As internationally recognized company we are experienced in creating Joint-Ventures with international companies specialized in civil works. Such JVs have several advantages for the Employer:</p> <ul style="list-style-type: none"> - Complementarity of know-how of JV members (civil and process works) - Financial risk mitigation: the JV members are jointly and severally liable - Reduction of costs (no cumulative overheads as with subcontractors) <p>Presently, the Bidder's experience requirements do not allow such JV.</p> <p>Consequently, we kindly propose you to review the Evaluation and Qualification Criteria as follow:</p> <ul style="list-style-type: none"> - Design, build & operate during 7 years of several SWRO plants requirement has to be fulfilled by the leader of the JV only in all its terms (no combination of references allowed). - The other members of the JV must have minimum experience in civil works for either waste or drinking water treatment plants , pipelines and reservoirs in recent past years and for at minimum similar size projects - Civil works companies must also have significant experience in marine or underwater works but not necessarily for SWRO desalination plant process (for example: river or sea water intake as well as underwater buried pipes laying of nominal diameter 500 mm minimum and no less than 1000 m length), in recent past years. - In order to minimize financial risks for the Employer, the financial requirements may also be increased for each JV member (for example: turnover above 150 	Refer Revised Bidding Document; Section 3: EQC

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145.	03-02-01					Requesting for a 01 month extension for the desalination project of Jaffna. Reason: the requirements for the marine works, civil works and process makes necessary to subcontract different packages and for that reason some extra time. is necessary in order to control all the process (though subcontracted separately all are interconnected) and minimize price and risk.	Extension provided.
146.	04-01-01					<p>After a review of the tender documents, we notice that we did not receive the following documents:</p> <ul style="list-style-type: none"> - Attachment A.2.6: RDA requirements for Pipe trenches, backfilling and reinstatement (we received only a DWG file with a lot of standard trenches sections, but no document describing the RDA specification for material requirements; consequently, we cannot select the various materials as per RDA requirements) - Attachment A.2.7: Pipes & specials specifications and bridge & culvert crossing details - Attachment A.2.8: Environmental Impact Assessment Report of the SWRO desalination plant site and Environmental Management Plan - Attachment A.3.2: Standard for effluent disposal - Attachment A.3.3: Standard for solid waste disposal <p>Could you please share these document with us?</p>	Refer Revised Bidding Document; Section 6: ERQ - Attachments
147.	04-02-01	Part VI	6	27	2.1.2.3	<p>It is stated that "Contractor shall also include all required costs to design and build all key equipment and facilities at elevation of a minimum of 0.3 meters above the general site levels or the 100-year flood line whichever is higher [...] The site/ground level will have to be raised by around 500 to 800 mm in some areas to achieve a site finished level at nominally 3+ meters above mean sea level".</p> <p>We understand that the 100-year flood line level is 2,7 m above mean sea level and that the level of the plant should be at 3 m. Please confirm.</p>	Finished floors of all buildings shall be a minimum 300 mm (0.3 meters) above the maximum existing ground elevation of SWRO plant site.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
148.	04-02-02	Part VI	6	44	3.5	<u>Site Establishment:</u> We understand the areas beside the plant site are governmental land and are then available for temporary work site facilities like offices, storage areas, etc. Please confirm.	The Contractor shall utilise the allocated land plot (200 m X 200m) for SWRO plant as much as possible.
149.	04-02-03	Part VI	6	50	3.7.10	<u>Roadways:</u> Paved roads and areas inside SWRO plant site shall be designed for heavy traffic load (20 ton 16 wheel trucks) consisting of asphalt concrete (AC) on aggregate base course over compacted subgrade. Which design criteria must we consider for the new roads outside the plant site? Please advise.	Refer Revised Bidding Document; Section 6: ERQ – Chapter 1.3.7 (u)
150.	04-02-04	Part VI	6	51	3.7.12	Which category of seismic zone shall we consider for Jaffna desalination plant site?	Sri Lanka is relatively free of seismic activity. Only what is the building codes need be applied.
151.	04-02-05	Part VI	6	85	9.4	<u>Road Custodian Authorities requirements:</u> Please share with bidders the section drawings of the existing roads along the Drinking Water Conveyance Pipe Route. We will then be able to proceed to road reinstatement exactly as it was.	Refer Revised Bidding Document; Section 6: ERQ – Attachment - A.2.7.b_Drawings
152.	04-02-06	Part VI	6	101	14.1.1	<u>Connection of SWRO Desalination Plant to Power Supply System:</u> Please confirm the exact location of the connection point to the high-voltage power supply system of Ceylon Electricity Board.	Refer Revised Bidding Document; Section 6: ERQ- Attachment A.2.5 (The tentative location is marked as “A” at the boundary of the SWRO plant site.
153.	04-02-07	A.2.2 - Geotechnical survey	6	19	9	In the drawing showing the location of the various boreholes (BH1 to BH8 – page 19 of Geotechnical Survey), can you please indicate on which side is the sea and the direction of North?	Refer Revised Bidding Document; Section 6: ERQ: Attachment – A.2.2 – Page 19 The BH 8 is towards seaside.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
154.	04-02-08	A.2.2 - Geotechnical survey	6	12	6.2.3	We understand that the borehole BH10 is located where the intake pipe which crosses the causeway that goes along the shoreline: please confirm.	No. BH 10 is at Causeway Crossing along potable water conveyance. BH 9 is at shoreline along the intake pipe line.
155.	04-02-09	A.2.4	6	79	7	<p>Could you provide us with the intake and outfall pipes profiles in DWG format (attachment A.2.4 page 79), indicating:</p> <ul style="list-style-type: none"> - the Chart datum (hydrographic level = 0) - the mean sea level in relation to Chart datum (hydrographic level = 0) - the highest and lowest tide level - the 100-year flood line level 	Refer Revised Bidding Document; Section 6: ERQ – Chapter 6 Attachment A.2.4
156.	04-02-10	A.2.5	6	1		<p>Please share with Bidders the preliminary geotechnical survey (as stated in attachment A2.5 page 1) of the Potable Water Conveyance pipe route, describing inter alia:</p> <ul style="list-style-type: none"> - The type of soil (sand, clay, etc.) - The underground water level - The presence of a geotextile underground (especially under the road crossing the lagoon) - Section drawings of the road crossing the lagoon 	Refer Revised Bidding Document; Section 6 : ERQ: Attachment – A.2.2 – Data for BH10.
157.	04-02-11	A.2.5	6	2		<p><u>Potable Water Conveyance & Points of Delivery of Desalinated Water to the JKWSSP Water Supply System:</u></p> <p>We understand that the DBO contract comprises only:</p> <ul style="list-style-type: none"> - Potable Water Conveyance Main (from SWRO Desalination Plant to Water Delivery Point at Puthukkadu junction): ductile iron pipe ND800, length = 7963 m, including fittings, valves, various crossings, road reinstatement, etc. - New asphalted road to be fully constructed for the initial 550 m <p>Please confirm.</p>	Refer Revised Bidding Document; Section 6: ERQ: Chapter 9 – Table 9.1 and Chapter 1.3.7.10 (u)

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
158.	04-02-12	A.2.5	6	2		Lagoon water analysis: In order to determine the external coating of ductile iron pipe for drinking water conveyance, can you forward us an analyse of the water in the lagoon, especially pH, main dissolved salts (chloride, sulphate, calcium, magnesium, total alkalinity, etc.) and conductivity?	Refer Revised Bidding Document; Section 6: ERQ: Attachment 2 - A.2.3.f
159.	04-02-13	A.2.5	6	2		Can we propose an alternative of pipe material for drinking water conveyance?	The pipe material is to be Ductile Iron.
160.	04-02-14	A.2.5	6	Drawings		Please share with Bidders the detailed drawings of: - intermediate connection chambers (if any, at the different node in particular) - delivery point connection chambers, as well as its exact location	There are currently no connections to these roads which are relevant to this Contract. Refer Revised Bidding Document; Section 6: ERQ- Attachment A.2.5.b In Attachment A.2.5.b, the tentative location of "Delivery Point" is marked as "C" at the A9 road B402 road junction.
161.	04-02-15	Attachments 2 and 3	6		Various documents	After a review of the tender documents, we notice that we did not receive the following documents: - Attachment A.2.6: RDA requirements for Pipe trenches, backfilling and reinstatement (we received only a DWG file with a lot of standard trenches sections, but no document describing the RDA specification for material requirements; consequently, we cannot select the various materials as per RDA requirements) - Attachment A.2.7: Pipes & specials specifications and bridge & culvert crossing details - Attachment A.2.8: Environmental Impact Assessment Report of the SWRO desalination plant site and Environmental Management Plan - Attachment A.3.2: Standard for effluent disposal - Attachment A.3.3: Standard for solid waste disposal Could you please share these document with us?	Refer Revised Bidding Document; Section 6: ERQ - Attachments

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
162.	04-03-01	Evaluation and Qual Criteria	3	6 to 12	2.3 and 2.4	<p>Financial requirements and Bidder's experience</p> <p>The Evaluation and Qualification Criteria state that, in case of a Joint-Venture, each partner must meet the following requirements related to Bidder's experience: design, build & operate during 7 years of several SWRO plants of similar sizes within the last 10 years, inside and outside the Bidder's country. As internationally recognized company for civil, pipeline and marine works we are experienced in creating Joint-Ventures with international companies specialized in water treatment processes for the design, electromechanical / SCADA works, commissioning and operation of water treatment plants. Such JVs have several advantages for the Employer:</p> <ul style="list-style-type: none"> - Complementarity of know-how of JV members (civil and process works) - Financial risk mitigation: the JV members are jointly and severally liable - Reduction of costs (no cumulative overheads as with subcontractors) <p>Presently, the Bidder's experience requirements do not allow such JV because we do not have the necessary experience in design and operation of such sized SWRO plant, while we have very strong references in civil works for water treatment plants, pipelines, reservoirs and marine works.</p> <p>Consequently, we kindly propose you to review the Evaluation and Qualification Criteria as follow:</p> <ul style="list-style-type: none"> - Design, build & operate during 7 years of several SWRO plants requirement has to be fulfilled by the leader of the JV only - The other members of the JV must have minimum experience in civil works for either waste or drinking water treatment plants , pipelines and reservoirs in recent past years and for at minimum similar size projects - Civil works companies must also have significant experience in marine or underwater works but not necessarily for SWRO desalination plant process (for example: river or sea water intake as well as underwater buried pipes laying of nominal diameter 500 mm minimum and no less than 1000 m length), in recent past years. - In order to minimize financial risks for the Employer, the financial requirements may also be increased for each JV member (for example: turnover above 150 million USD and financial resources 	Refer Revised Bidding Document; Section 3: EQC

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
163.	05-01-01		Section 4 – Bidding Forms Section 6 – Employer Requirements	5 and 6 71	Form AT1-LTB: Attachment No. 1 to the Letter of the Technical Bid 6.1.4 (c)	<p><i>“Is the proposed pre-treatment Base Case meet the Employer’s requirements and if any options are offered, those will meet system one of the four acceptable pre-treatment systems defined in Table 6-1 of the Technical Specifications of the ERQ (Chapter 6 – Pre-treatment Facilities)?” and “If ultrafiltration (UF) membrane filters are proposed for seawater pre-treatment are these filters designed to comply with the maximum membrane flux requirements indicated in Table 6-1?”</i></p> <p><i>“c) If the Bidders wishes to offer an alternate pre-treatment system the Bidder may consider the four example configurations presented in Table 6 -1 or propose any other pretreatment alternative, provided they have designed and operated successfully in the past at other full scale seawater desalination projects.”</i></p> <p>Please clarify</p> <p>(a) With the installed plant capacity being only 24 MLD, we would expect to have only 3 DAF units to produce the required clarified water flow. To have two DAF units out of service at any one point seems excessive with this number of operating DAF units. Please confirm if the maximum loading rate for DAF can be changed to 35 m³/m².hr with one DAF unit out of service.</p> <p>From Table 6-1, we assume that the maximum loading rates for UF system is for the submerged type UF system. Please confirm the maximum loading rates for pressurised UF system.</p>	Refer Revised Bidding Document; Section 6: ERQ – Chapter 6

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
164.	05-01-02		Section 6 – Employer Requirements	13	1.3.1 (e)	<p><i>“e) Dry well with all required flood-prevention sumps & controls”</i></p> <p>Please confirm acceptance if vertical turbine pumps can be provided as seawater intake pumps and omit the provision of a dry well to minimise flooding risk and endangerment to operator.</p>	The requirement stands as it is.
165.	05-01-03		Section 6 – Employer Requirements	15 82	1.3.4 (b) 8.7	<p><i>“Disinfection system incorporating calcium hypochlorite dosing systems.”</i></p> <p><i>“A chlorine residual analyser shall also be provided on the potable water line after the plant storage tank and the information may be used to adjust the sodium hypochlorite feed pump to ensure residual chlorine levels leaving the potable water tank are compliant with Employer requirements (taking account of the residence time and mixing in the potable water tank).”</i></p> <p>Sodium Hypochlorite is required for Intake System dosing and UF CIP by the specification. To reduce the number of chemicals on site, it will be more practical to use Sodium Hypochlorite instead of calcium hypochlorite for Post-Treatment. Please confirm if this is acceptable.</p>	Sodium hypochlorite is to be used for disinfection and the control of biological growth throughout the plant. Chlorine gas is to be used for disinfecting the potable water.
166.	05-01-04		Section 6 – Employer Requirements	27 69	2.2 (Table 2-3) 6.1.2	<p><i>“Table 2-3: Silt Density Index (SDI) < 3 (at least 95% of the time)”</i></p> <p><i>“It is the Employer’s expectation that the system selected by the Bidder shall achieve final SDI₁₅ value below 3 at all times.”</i></p> <p>Please confirm that our assumption for Table 2-3 of SDI₁₅ < 3 (at least 95% of the time) is correct.</p>	Refer Revised Bidding Document; Section 6: ERQ – Chapter 2- Table 2.3

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
167.	05-01-05		Section 6 – Employer Requirements	52	3.8.2.2	<p><i>“Manual Bidders on 5-centimeter (cm) and larger valves shall be gear type.”</i></p> <p>Please confirm our assumption that “manual bidders” refers to manual actuators.</p> <p>It is normal practice to use gear type for valves that are DN 200 and larger for low pressure applications. Please confirm that this is acceptable.</p>	Refer Revised Bidding Document; Section 6: ERQ – Chapter 3.8.2.2
168.	05-01-06		Section 6 – Employer Requirements	53	3.8.2.4	<p><i>“All chemical lines shall be run in secondary containment piping systems external to containment areas.”</i></p> <p>Please confirm that secondary containment piping systems are only required for concentrated chemicals. Secondary containment piping systems will not be provided for chemicals diluted with carrier water.</p>	Secondary containment lines are only required for concentrated chemicals or in situations where a plant worker could be sprayed with chemicals if a pipe ruptured, such as in overhead lines crossing a maintenance area.
169.	05-01-07		Section 6 – Employer Requirements	53 and 54	3.8.2.2 and 3.8.2.4	<p><i>“Automatic flow and control valves shall be furnished with electric motor.” and “The main chemical pump suction outlet line shall be equipped with a motor operated isolation valve (lined plug type) which will open when an injection pump starts and close when all injection pumps stop.”</i></p> <p>Please clarify</p> <p>(a) Pneumatic control valves may be used. Pneumatic actuated valves are preferred as it is faster in response time and pneumatic positioner is more reliable than motor operated for flow control. Please confirm acceptance.</p> <p>Please confirm if ball or diaphragm valve may be used for chemical service due to ease in operation. Kindly also confirm acceptance if pneumatic valves may be used for chemical service to allow valves to fail close.</p>	<p>Pneumatic actuated valves may be used.</p> <p>Ball, diaphragm or pneumatic valves may be used in chemical lines.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer																
170.	05-01-08		Section 6 – Employer Requirements	54	3.8.2.4	<p><i>“All connections to chemical storage tanks (excluding vent, overflow, and top entry fill connections) shall be furnished with metallic body isolation valves connected directly to the tank flange and adequately supported.”</i> and <i>“Piping between the tank connection and valve shall be metallic.”</i></p> <p>Metallic pipes and valves are unsuitable for certain chemicals. Please confirm that supplier standard piping and valves may be used for chemical applications.</p> <table border="1"> <thead> <tr> <th>Chemical</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>Sodium Hypochlorite</td> <td>Chlorinated Polyvinyl Chloride (CPVC)</td> </tr> <tr> <td>Sodium Hydroxide</td> <td>Chlorinated Polyvinyl Chloride (CPVC)</td> </tr> <tr> <td>Sulphuric Acid (98%)</td> <td>SS 316</td> </tr> <tr> <td>Sodium Meta Bisulphite</td> <td>Chlorinated Polyvinyl Chloride (CPVC)</td> </tr> <tr> <td>Ferric Chloride</td> <td>Chlorinated Polyvinyl Chloride (CPVC)</td> </tr> <tr> <td>Lime Slurry</td> <td>Chlorinated Polyvinyl Chloride (CPVC)</td> </tr> <tr> <td>Antiscalant</td> <td>Chlorinated Polyvinyl Chloride (CPVC)</td> </tr> </tbody> </table> <p>Please confirm if the above arrangement is acceptable.</p>	Chemical	Material	Sodium Hypochlorite	Chlorinated Polyvinyl Chloride (CPVC)	Sodium Hydroxide	Chlorinated Polyvinyl Chloride (CPVC)	Sulphuric Acid (98%)	SS 316	Sodium Meta Bisulphite	Chlorinated Polyvinyl Chloride (CPVC)	Ferric Chloride	Chlorinated Polyvinyl Chloride (CPVC)	Lime Slurry	Chlorinated Polyvinyl Chloride (CPVC)	Antiscalant	Chlorinated Polyvinyl Chloride (CPVC)	Confirmed. The supplier standard piping and valves shall be used for chemical applications.
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No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
171.	05-01-09		Section 6 – Employer Requirements	69	6.1.2	<p><i>“Submerged type Ultrafiltration System will be provided to reduce the SDI to a value suitable for RO membranes as well as reduce bacteria and virus.”</i></p> <p>Please confirm that pressurised Ultrafiltration System is acceptable for both base and optional pre-treatment schemes.</p>	Refer Revised Bidding Document; Section 6: ERQ – Chapter 6
172.	05-01-10		Section 6 – Employer Requirements	87	10.2	<p><i>“The discharge retention tank will have at least two compartments to facilitate periodic cleaning. The retention time and volume of the tank shall be selected such that this tank can retain the volume of at least two filter backwashes for their sequential duration; the volume of sludge from the lime clarifiers or backwash water from the limestone contactors (if limestone is used for post-treatment), and the volume of spent CIP and flush water of at least two SWRO trains occurring at a time.”</i></p> <p>We do not believe that there is a need to mix the backwash/filter waste with the CIP/flush waste for neutralisation. It is more suitable to segregate both wastes as it will be hard to neutralise the chemical wastes due to dilution from the backwash/filter waste.</p> <p>Please confirm if the following arrangement is acceptable.</p> <p>Discharge Retention Tank – Each compartment to be sized for one CIP waste and flush water.</p>	The backwash water and the flush water do not need to be mixed and may be kept separate in different compartments to improve their neutralisation.
173.	05-01-11		Section 6 – Employer Requirements	90	10.6.1	<p><i>“With their proposal, the Bidder shall provide the sufficient information on the design of discharge retention tank specified in Table 10-1.”</i></p> <p>Table 10-1 is missing. Please provide.</p>	Refer Revised Bidding Document; Section 6: ERQ – Chapter 10.6.1

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
174.	05-01-12		Attachment 2.5.1	2	1 and 2	<p><i>"Specifications for supply and installation of mechanical / electrical components – As per general specifications" and "Specifications for pipes & fittings, valves, accessories and installations – As per general specifications"</i></p> <p>Please confirm that <i>"general specifications"</i> refer to Section 6: Employer's Requirements of the tender documents. If not, kindly provide the general specifications.</p>	Refer Revised Bidding Document; Section 6: ERQ - Attachment A.2.7.a_Specifications
175.	05-01-13		Section 6 – Employer Requirements	6-15	1.3.4 (g)	Please confirm the monitoring location of the mentioned parameters.	The quality of the product water is to be monitored downstream of the treatment plant but before the Product Water Storage Tank.
176.	05-01-14		Section 6 – Employer Requirements	6-16	1.3.5 (b)	<p><i>"b) On-site Pump station building with all required facilities to install 2 X 6 MLD and 3 x12 MLD high-lift pumps (only 2 X 6 MLD and 2 x 12 MLD Pumps shall be installed initially);"</i></p> <p>Kindly advise when will the additional unit of 12 MLD Pumps be installed.</p>	Additional unit of 12 MLD pump shall be installed in later stage. Bidder shall provide the space only and no need to supply the pump.
177.	05-01-15		Section 6 – Employer Requirements	6-107	16.2	Kindly confirm that the "employment costs" stated in the clause includes all the cost but not limited to salary, bonus, benefits, insurance and medical etc. required complying with Sri Lanka Labour Law.	<p>The Contractor is to cover all costs of the employment of its staff as required by Sri Lankan laws and regulations.</p> <p>The costs of any staff provided by the Employer will be fully covered by the Employer.</p>
178.	05-01-16		Section 6 – Employer Requirements	6-128	16.15.19	Please provide the State and National Critical Infrastructure Access and Security requirements.	The Contractor shall provide sufficient security to ensure ingress and egress are strictly controlled.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer															
179.	05-01-17		Section 6 – Employers Requirements	1	Attachment 4 - Design Review Deliverables	<p><i>“The Design Period is 8 months (240 days) from the Effective Date”</i></p> <table border="1"> <thead> <tr> <th>No</th> <th>Deliverables</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Design and Engineering</td> <td>8 months</td> </tr> <tr> <td>2</td> <td>Construction</td> <td>16 months</td> </tr> <tr> <td>3</td> <td>Pre-Commissioning, Testing & Commissioning</td> <td>6 months</td> </tr> <tr> <td>4</td> <td>Operation Service</td> <td>7 years</td> </tr> </tbody> </table> <p><i>“Time for Completion for parts of the Facilities:</i></p> <p><i>Part 1: Design of whole works specified in Section 6 shall be hundred and eighty days (180) from the effective date</i></p> <p><i>Part 2: supply and installation services excluding operation and maintenance of whole works specified in section 6 shall be seven hundred and thirty days (730) from the effective date”</i></p> <p>Please confirm which timeline is to be followed.</p> <p>Please clarify if the duration of seven hundred and thirty (730) days from Part 2 of App. 3 of Section 9 includes Testing and Commissioning.</p>	No	Deliverables	Duration	1	Design and Engineering	8 months	2	Construction	16 months	3	Pre-Commissioning, Testing & Commissioning	6 months	4	Operation Service	7 years	Refer Revised Bidding Document : Section 6: ERQ Chapter 3.2.1 and Attachment A.4.1 Section 9: COF Appendix 2 and 3
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			Section 9 – Contract Forms	9-15	Appendix 3 – Time Schedule																	

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
180.	05-02-01		Section 6 – Employer Requirements	6-111	16.9	“The Contractor shall be responsible for management and oversight of the collection, containment, treatment and disposal of all waste streams generated at the Works and listed above and for the operation of all waste stream equipment, facilities and plant outfall.” Kindly advise the possible waste sludge disposal area/ STP plants in Jaffna or nearby areas.	There are no nearby sewage pipes and it is expected that a septic tank will be used for the treatment of human waste. The septic tank will need to be de sludged at least once every year (depending upon its size) by a local de sludging contractor, which will dispose of the sludge to an approved waste disposal facility. The sludge generated from water treatment process shall be dried through drying bed within the plant site.
181.	05-02-02		Section 6 – Employer Requirements	6-13	1.3.1 (k)(vi.)	Clause 1.3.1 is about Seawater Intake System, please confirm that Works Discharge Permit is the correct reference as it seems to be referred to SWRO Desalination Plant Concentrate/Waste Discharge Limits.	Refer Revised Bidding Document : Section 6: ERQ Chapter 1.3.1 (k) (vi)
182.	05-02-03		Section 6 – Employer Requirements	6-44	3.5.1 (a) & (b)	Please confirm the mentioned Main Office Building and Sub Office building are referred to site office during construction period only.	Confirmed.
183.	05-02-04		Section 6 – Employer Requirements	6-57	3.12.1 (e)	Please detail the requirements for Land Management Plan and kindly provide a copy of it.	Bidder shall provide the Land Management Plan based on the Environmental Study given in Revised Bidding Document : Section 6: ERQ Attachment A.2.8
184.	05-02-05		Section 6 – Employer Requirements	6-60	3.12.15 (a)	Please detail the requirements for Stakeholder Engagement Strategy and Action Plan and kindly provide a copy of it.	Bidder shall provide the Stakeholder Engagement Strategy and Action Plan based on the Environmental Study given in Revised Bidding Document : Section 6: ERQ Attachment A.2.8

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
185.	05-02-06		Section 6 – Employer Requirements	101	14 .1.1	<p>“The power circuit supplying the SWRO Desalination Plant will deliver 33 kV power to the SWRO Desalination Plant boundary.” Please confirm that the supply of 33 kV power cables from national grid to plant boundary is not in Bidder scope.</p>	<p>Revised Bidding Document : Section 6: ERQ Chapter 14.1 Section 4: BDF Price Schedule 4.3 – Item 2 Chapter 3: Sub Clause 3.2. (g).</p> <p>The electricity supply will be as follows:</p> <ul style="list-style-type: none"> • one 33 kV high voltage line coming from the CEB grid to a 33kV/1.1 kV substation at the plant site • one high voltage 33kV to 1.1 kV step down substation located at the plant site • The above infrastructure will be provided by the CEB and able to support a 48 MLD plant and a provisional sum is provided for this. <p>Power supply within the plant to be provided by the Contractor and able to support a 24 MLD plant to be provided by the Contractor and included in the bid price.</p>
186.	05-02-07		Section 6 – Employer Requirements	101	14 .1.1	<p>“ The Bidder shall construct all plant facilities needed to supply electricity for the plant and shall complete the connections to the high-voltage power supply system of Ceylon Electricity Board.” (a) Please confirm that only cable terminations at both ends (i.e. at 33 kV national grid outgoing circuits and Bidder’s 33kV incoming circuits) are included in Bidder’s scope. (b) Please provide existing 33kV national grid Single Line Diagram or any other information and National Standard, to understand the requirement from the national grid.</p>	<p>Revised Bidding Document : Section 6: ERQ Chapter 14.1 Section 4: BDF Price Schedule 4.3 – Item 2 Chapter 3: Sub Clause 3.2. (g).</p> <p>The electricity supply will be as follows:</p> <ul style="list-style-type: none"> • one 33 kV high voltage line coming from the CEB grid to a 33kV/1.1 kV substation at the plant site • one high voltage 33kV to 1.1 kV step down substation located at the plant site • The above infrastructure will be provided by the CEB and able to support a 48 MLD plant and a provisional sum is provided for this. <p>Power supply within the plant to be provided by the Contractor and able to support a 24 MLD plant to be provided by the Contractor and included in the bid price.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
187.	05-02-08		Section 6 – Employer Requirements	101	14.1.2	<p>“All low voltage motors 440V ($\pm 1\%$ tolerance) and 230V ($\pm 1\%$ tolerance) with 50Hz shall be totally enclosed fan cooled with super-efficient ratings unless otherwise specified.”</p> <p>Since upstream is 33kV and only low voltage motors are required, we propose to step down the incoming voltage from 33kV to 11kV, then 11kV to 480V. Please advise what are the voltage levels preferred to be used in this plant, or any National Standards to comply.</p>	The Contractor is required to design all the electrical works from the downstream of the supply brought to the site (from the CEB) to the various Project infrastructure to the electrical Standards listed in the Bidding Document and in a safe manner. It is suggested that a Hazops be held on this topic as part of the detailed design. It must be emphasised that the responsibility for the design rests with the Contractor.
188.	05-03-01		Section 3 – Evaluation and Qualification Criteria	3-4	2	In order that the Parent Company of a qualifying subsidiary is not restricted from being the bidder, we would like to request you to consider amending the first para as “It is the legal entity or entities comprising the bidder or the bidder’s subsidiaries that must satisfy the qualification criteria described below”	Revised Bidding Document : Section 3: EQC
189.	05-04-01		Section 6 – Employer Requirements	6-23	1.7.2 (d)	Please confirm that the inventory of spares shall only include critical spare parts for the high-pressure pumps instead of the whole unit of pump as according to common industrial practice	Confirmed.
190.	05-04-02		Section 6 – Employer Requirements	6-110	16.5	Please confirm that the O&M Contractor will be given sufficient time in cold-starting the plant, ramping up or ramping down the plant production capacity in response to any change in Water Supply order by the Employer.	The Contractor shall produce to meet the downstream water demand; Refer Revised Bidding Document; Section 6 ERQ: Chapter 1.2.1
191.	05-04-03		Section 6 – Employer Requirements	6-109	Table 16-2	As refer to the Amendments and Clarifications during the Pre Bid Meeting, please confirm that the table need not be followed, where Contractor shall satisfy its own staffing needs in recruiting personnel with adequate qualification and experience to operate and maintain the plant.	Refer Revised Bidding Document; Section 6 ERQ: Table 16-2 – Note (2).

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192.	05-04-04		Section 6 – Employer Requirements	6-124	16.15.2 (a)	Please confirm that Employer's requirement for daily quantity of Water Supply shall be requested in the block increment/decrement of 6MLD. ie. 6MLD, 12MLD, 18 MLD or 24MLD.	The specification for the plant has called for increments of 6 MLD as you have suggested. That is not to say that a single train will operate for an entire day (allowing for the previous point). It is expected that some modelling will be required to fine tune the operational protocols that this project needs. However, for design and construction of this plant the 6MLD increment remains.
193.	05-04-05		Section 6 – Employer Requirements	6-124	16.15.2 (b)	Please confirm that the take-or-pay minimum order of daily Water Supply quantity placed by the Employer shall be 6 MLD.	The Employer will pay for the water it orders.
194.	05-04-06		Section 4 – Bidding Forms	4-20	2.1.8 xviii	Please provide relevant Sri Lanka legislation and statutory requirements with respect to chemicals storage, handling and chemical safety.	The Bidder shall refer Central Environmental Authority web site and also shall follow the guidance of the supplier.
195.	05-04-07		Section 4 – Bidding Forms	4-21	2.1.9 p	Please provide relevant Sri Lanka environment standards pertaining to environment control, ie, plant/building waste disposal.	The Bidder shall refer Central Environmental Authority web site and Refer Revised Bidding Document; Section 6: ERQ – Attachment – A.2.8. Environmental Study
196.	05-04-08		Section 6 – Employer Requirements	6-98	13.1	Foundation field bus instruments are requested for this tender, however, we would like to propose Hart-enable instruments instead of Foundation field bus instruments. The Hart-enable instruments are recommended instead of Foundation instrument due to the HART Protocol is one of the most popular industrial protocols today with HART-enabled instruments huge installed in chemical and process plants worldwide. Nearly most process transmitters made today are HART compatible. The Hart instruments could be configured and diagnosed easily with a HART handheld communicator. Please advise if this is acceptable.	This is acceptable proving the bidder provides evidence that (1) it is commonly used, (2) it does not limit the supply of instruments to a single supplier in the future, and (3) That it is fit for purpose.

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197.	05-04-09		Attachment A.2.3.a_Annex 1 Bathymetric Surveyed Drawings	2		Please provide the intake pipe, outfall pipe, transmission pipe coordinates and the site coordinates and floor elevation with respect to Mean Sea Level. Please confirm if there is a dedicated easement for the intake and outfall pipe from the shore to site. If not, kindly confirm acceptance that the pipes shall be routed to a location best suited to the Bidder's plant layout.	The locations of the intake and diffuser have been provided. No specific easements are required. The Contractor will be permitted to construct the connecting pipelines (within Environmental Requirements). Refer Revised Bidding Document; Section 6: ERQ – Attachment 2
198.	05-04-010		Section 4 – Bidding Forms Form 09 – Manufacturer's Authorisation	4-37		Referring to Form 09, "Manufacturer's authorisation", and GCC states "We hereby extend our full guarantee and warranty in accordance with Clause 27 of the General Conditions of Contract, with respect to the goods offered by the above firm." Please advise as there is no clause 27 identified in General Conditions laid out as per Federation Internationale des Ingenieurs – Conseil, (FIDIC) First Edition 2008.	Noted. Refer Revised Bidding Document; Section 4: BDF: Form 9.
199.	05-04-11		Section 6 – Employer Requirements	6-111	16.9	Please advise solid and sludge disposal areas, authorized by National Water Supply and Drainage Board for disposal of waste membranes etc. and sludge from plant areas.	The Employer shall guide to a place for disposal. The Bidder shall assume that the disposal place would be within 50km from SWRO plant.
200.	05-04-12		General			Kindly provide the approved supplier/ contractor applicable for this tender.	Refer Revised Bidding Document; Section 3: EQC: 2.5 and NWSDB web site.
201.	05-04-13		Section 6 – Employer Requirements	6-12	Para-5	"The design, supply and laying of potable water conveyance (approximately 8 km) shall include pipe network from SWRO Desalination Plant to Water Delivery Point at Puthukkadu.." Junction (Figure 1-3). Kindly confirm that the piping route suggested in the tender does not pass through any private land and that Client has taken necessary permissions. Our concern is related to any potential land issues on the proposed route and we wish to confirm that the entire strength of proposed pipe route passes through Government land and the bidder will not encounter any land acquisition issues on the suggested route.	The NWSDB will assist in obtaining access to the land required to build the pipeline. There will be no land acquisition required. The pipeline will follow the route of the road and be contained within the road reserve. There will be some environmental limitations regarding the width of the pipe track but these will not be onerous. Refer Revised Bidding Document Section 6: ERQ – Attachment – A.2.8. Environmental Study
202.	05-04-14		Section 6 – Employer Requirements	6-13	1.3.1	Online instrumentation for Algal content and Boron are unavailable in the market. These would have to be based on laboratory measurements. Kindly confirm.	This is agreed. Provision is made for testing parameters on line where this is possible and using laboratories where not.

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203.	05-04-15		Section 6 – Employer Requirements	6-20	1.3.10(b)	Kindly clarify the scope with regard to the second source of reliable source of power. We wish to confirm our understanding that the incomer power supply infrastructure up to the plant boundary is by client.	<p>The primary source of electricity is a feed from the CEB. A diesel generator is required to provide backup power to the plant should there be a power failure. The diesel generator is not expected to run the plant but rather protect the assets by permitting its orderly shutdown and running basic facilities at the plant (for example lighting a computer systems.</p> <p>Refer Revised Bidding Document : Section 6: ERQ Chapter 14.1 Section 4: BDF Price Schedule 4.3 – Item 2</p>
204.	05-04-16		Section 6 – Employer Requirements	6-20	1.5.2.	Other plant performance requirements: Kindly clarify the wording (as part of acceptance test and every year.) After successful demonstration of EPC guarantees during T&C, the expectation from the O&M contractor would be to operate the plant as per client's despatch instructions within the design envelope. Prime responsibility being meeting the overall performance parameters of quantity and quality. This being a DBO contract it's not common to demonstrate a variety of internal parameters section wise every year. We would request your reconsideration to restrict the performance parameters to overall performance obligations. Further on item h) Other stake holder, social and community obligations. commitments. Usually the requirements of social and community obligations are the responsibility of client and not that of EPC or O&M contractor. Kindly clarify if the prime responsibility of meeting these requirements would rest with client.	<p>Refer Revised Bidding Document : Section 6: ERQ Chapter 1.5.2</p> <p>There are social and environmental obligations that the contractor needs to comply with (as there are some the Employer must comply with) – these are in the EMP.</p>
205.	05-04-17		Section 6 – Employer Requirements		1.6.1(o)	Operating the works in such a manner to achieve ISO standards. Wish to clarify that the contractor's role would be to "assist" the client in "achieving" ISO standards, as the certification by ISO is by external agency that is not in control of the contractor.	The Contractor is expected to have a quality system that is aligned to the relevant ISO Standards. There is not a requirement to go to full accreditation. However, these ISO Standards will be used as the basis of auditing, and Contractor may be required to address gaps.

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206.	05-04-18		Section 6 – Employer Requirements		1.7.1	Asset replacement fund. Kindly clarify the intent with regards to whether is this part of the O&M price that the bidder would quote.	The Asset Replacement Fund is a real cost to the Project and as such needs to be priced. It is simply a measure of the degree to which assets will be replaced over the Operate Service Period. Refer Revised Bidding Document : Section 6: ERQ: Chapter 1 – 1.7 Section 4: Price Schedule 6 – Asset Replacement.
207.	05-04-19		Section 6 – Employer Requirements	6-25	Table 2.1	Nitrates, Phosphates content looks unusually high for sea water in our experience. Kindly reconfirm.	Determining the raw water quality is the sole responsibility of the Bidder. The raw water quality given in Tables 2-1 and 2-2 of Section 6 reflect what the employer knows of the seawater quality at the location of the proposed intake. In designing the treatment system the Contractor is required to satisfy itself of the raw water quality.
208.	05-04-20		Section 6 – Employer Requirements		2.1.2.2	Wish to clarify and confirm that the Desalination plant like all other plants would be designed to meet the Design feed water quality specification (as per Table 2.1). It needs to be recognised in the contract that the plant performance may be impacted if the feed water quality specification is outside the feed water specification. Suitable provisions with regards to contractors obligations may kindly be considered to capture this aspect in such situations.	(1) The data collected by the Employer has been made available to the Bidders – this data is limited to the period of sampling and the number of samples taken and may not be fully representative of the full data set (2) The Bidders are requested to immediately undertake further sampling upon award of contract to better inform themselves of the sea water quality
209.	05-04-21		Section 6 – Employer Requirements	6-27.	2.2	Table 2.3 . Pre treatment water quality. Essentially the pre treatment filtrate water quality requirements would need to be consistent with the requirements of the down stream SWRO process and RO membrane supplier. This being a DBO contract with long term O&M responsibility, Inter stage quality and quantity requirements may kindly be considered to be the responsibility of the DBO contractor given that DBO contractor is bound by the over all performance obligations.	Refer Revised Bidding Document : Section 6: ERQ: Chapter 2: Table 2.2

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210.	05-04-22		Section 6 – Employer Requirements	6-30.	2.4	Concentrate/waste stream water quality parameters: Wish to high light that there are no corresponding parameters in the feed water quality specification in table 2.1 for some of the parameters in Table 2.5 .For example BOD, COD, most of the heavy metals etc. Kindly consider defining/including the corresponding values for such parameters in Table 2.1.	Noted. Refer Revised Bidding Document : Section 6: ERQ: Chapter 2: Table 2.5
211.	05-04-23		Section 6 – Employer Requirements	6-31	3.2	Removal and/or relocation of existing above and underground structures, piping and other facilities, equipment, debris, vegetation and other physical obstacles to..As the existing details will not be known to the bidder kindly provide the same (particularly underground structures if any).	The site of the desalination plant is to be considered free of underground structures, piping and other facilities.
212.	05-04-24		Section 6 – Employer Requirements			Stand By generator: Kindly clarify that the objective of the stand by generator is to safely shut down the plant in the event of power failure. It is not feasible to have the generator for plant operation.	It is agreed that it is not feasible to operate the plant using a generator.
213.	05-04-25		Section 6 – Employer Requirements	6-36	7.2	Power during T&C. Kindly clarify that the power required for T&C of the plant will be provided by client free of cost to contractor.	The cost for power required for Testing and Commissioning shall bear y the Contractor.
214.	05-04-26		Section 6 – Employer Requirements	6-36	5.1	Site Preparation Including Demolition & Relocation of Existing Facilities and piping - Kindly clarify if there are existing facilities that need to be demolished. Please provide details if there are.	The site of the desalination plant is to be considered free of underground structures, piping and other facilities.
215.	05-04-27		Section 6 – Employer Requirements	6-51	3.7.12	All anchor bolts, anchorage components and fasteners shall be constructed of duplex stainless steel of PREn Number of 35 or higher.The above is not common in our experience. Kindly reconfirm.	This is a requirement of the Employer.
216.	05-04-28		Section 6 – Employer Requirements	6-55	3.9.2	All transmitters shall have IP65 protection rating. This is applicable for explosion prone areas. Kindly clarify if the bidder could use his past experience for this specification and offer what is suitable for the application.	This is requirement of the Employer.

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217.	05-04-29		Section 6 – Employer Requirements	6-57	3.12.1, 3.12.2	Incorporating consultation with the local community and councils. Construction Environmental Management Plan to be developed that includes a work sitemap, coordinate and identifies any 'no go' zones, including any works that may adversely impact the local and neighbouring areas. The Contractor will be required to implement measures to maximize opportunities for local...Sire rehabilitation. Fishing community...Kindly clarify that the primary responsibility for the activities narrated in these sections is by client. Kindly clarify what the bidders responsibility would be or if the role is that of providing information or assistance where applicable. Request more clarity on this.	Part 3-12 has been deleted from the revised bidding document. Please note the requirements in the EMP (which are different to these). The main interaction with the community will be with the construction of the intake, effluent disposal and transmission pipeline.
218.	05-04-30		Section 6 – Employer Requirements	6-76	7.1(c)	The RO system of the 24 MLD plant shall be capable of continuous operation and production of drinking water of flow rate between 6 MLD and 24 MLD. Kindly clarify if the demand/dispatch patterns could be assumed to be in steps of 6 MLD.	It is recognised that there are limitations on the operations of the desalination plant and as well as start-up and shut down times. There is also a desire to minimise the wasting of product water.
219.	05-04-31		Section 6 – Employer Requirements	6-85	9.4	Road Custodian Authority requirements. Kindly clarify that required permits and licenses such as ROA or ROW have been secured or would be provided by client to the contractor.	The Employer will assist with the obtaining of permits needed.
220.	05-04-32		Section 6 – Employer Requirements	6-85	9.4	"A Provisional Sum is provided exclusively to make payments for refundable deposits and non refundable supervision estimates of the road custodian authorities" Kindly clarify if the provisional sum is paid at actuals or is part of contract price. If the latter, kindly advise what the provisional sum is.	The provisional sum shall be paid for actuals. The provisional sums shall not be included in to the bid evaluation.
221.	05-04-33		Section 6 – Employer Requirements	6-88	10.4	Disposal of solid waste: The solid waste generated at the SWRO Desalination Plant shall be disposed of by the operator according to the CEA guide lines. Kindly clarify if there is disposal site identified for this project and the location of the disposal site.	The Employer shall guide to a place for disposal. The Bidder shall assume that the disposal place would be within 50km from SWRO plant.

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222.	05-04-34		Section 6 – Employer Requirements	6-98	13.1	All panels in process areas shall be appropriately rated (including IP rated) and shall be of duplex steel construction. Duplex steel panels in our experience is not common. Kindly clarify if panels that are widely used in the industry with suitable corrosion resistant paint can be considered.	This is a requirement of the Employer.

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223.	05-04-35		Section 6 – Employer Requirements	6-27	2.1.2.3	Kindly provide the 100-year flood line.	<p>Refer Revised Bidding Document Section 6: ERQ Chapter 3, Clause 3.7.12. All levels quoted are to Mean Sea Level (MSL). The surface level of the site varies between approximately 3.5m on the inland side to 2.6m on the ocean side. The site has an average gradient of 0.9m from the inland to ocean. To the extent that it is economically sensible it is necessary to protect the assets to be constructed on the site from flooding.</p> <p>It is proposed to raise the site above the surrounding area, and to protect the site by a drainage system. Both actions fall within this contract. The site is to be elevated to at least 300mm above the surrounding area. This mean that on the inland side the site must be raised to a finished surface level of 3.8m above MSL, while on the ocean side the finished surface level must be 3.0m. The site may be graded or tiered between these two levels. The raised surface level must be suitably contained within a permanent retaining wall. A drainage system suitable for monsoon conditions must surround the site while an internal drainage system must also be installed. Drainage system may discharge their flows on the ocean side of the site in a manner that does not result in erosion. All buildings are to be constructed to the Sri Lankan building code. Buildings must be protected from the ingress of water from surface water. All underground conduits and trenches must also be protected from the entry of moisture and water.</p> <p>Bidders are advised that the site level, drainage system and building design and underground conduits and trenches will be checked for these aspects at the design and construction stages. .</p>

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224.	05-05-01		Section-9 Contract forms.	9-5	Schedule -1	Plant and Mandatory Spare Parts Supplied from Abroad. Ten percent (1 0%) of the total CIP amount as an advance payment after submission of the Design Report, Forty percent (40%) of the total or pro rata CIP amount after receipt of invoice and shipping Documents. Query: in our experience the Overseas equipment suppliers in this industry require 25-30% advance and 60-70 % prior to despatch of goods against LC. In order that the contractor does not suffer from negative cash flow for the project, we request you to kindly reconsider the payment terms to provide 30% advance and 60% payments on readiness of goods for despatch for this section of the works.	Refer Revised Bidding Document : Section 9: COF: Appendix 1
225.	05-05-02		Section-9 Contract forms.	9-5	Schedule 2 .	Schedule No. 2 - Plant and Mandatory Spare Parts Supplied from within the Employer's country : Ten percent (10%) of the total or pro-rata EXW amount as an advance payment after submission of the Design report. Query: We request to consider an advance of atleast 25% for this section as the manufacturers need to procure raw materials and other related costs to be able to deliver given that the next milestone payment is payable only upon delivery.	Refer Revised Bidding Document : Section 9: COF: Appendix 1
226.	05-05-03		Section-9 Contract forms.	9-5	Schedule 4 .	Schedule No. 4 -Schedule No.4 -Build Services : Ten percent (10%) of the total or pro-rata EXW amount as an advance payment after submission of the Design report. Query: We request to consider an advance of atleast 25% for this section as the contractor need to procure raw materials and other related costs to be able to deliver the build portion of the contract given that the next milestone payment is only upon completion of works a measured at site.	Refer Revised Bidding Document : Section 9: COF: Appendix 1

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227.	05-05-04		Section-9 Contract forms.	9-11	schedule 5.3	Procedures for Calculation of the Operation Service payments-Schedule 5.3: The Employer will reimburse the Contractor's SWRO plant electricity costs at cost, less any amounts payable in performance damages for non-achievement of the guaranteed minimum plant efficiency requirement. Query: As per tender specification (else where) providing electricity to operate the plant is in scope of employer. This being the case we request the employer to consider paying CEB directly for the electricity payments that are in employers scope. The electricity payments for Desalination project are significant sum and we foresee there would be cash flow issues for the contractor in the current mechanism of paying by way of reimbursement.	The Contractor shall pay the CEB for the electricity and shall in due course be reimbursed by the Employer. This transaction is expected to occur monthly. The Contractor is expected to have enough working capital to undertake the Project, and where necessary should factor the cost of providing this into its bid price. Also please note the limitations in Section 9 Functional Guarantees.
228.	05-05-05		Section-4 Bidding forms.	4-68	D schedule 5.3.-2,3&4	Contractor's Electricity Payment:Query: As per clause xx providing electricity to operate the plant is in scope of employer. This being the case we request the employer to consider paying CEB directly for the electricity payments that are in employers scope. The electricity payments for Desalination project are significant sum and we foresee there would be cash flow issues for the contractor in the current mechanism of paying by way of reimbursement. In this case the supply agreement would be between CEB and Employer. Kindly confirm.	The Contractor shall pay the CEB for the electricity and shall in due course be reimbursed by the Employer. This transaction is expected to occur monthly. The Contractor is expected to have enough working capital to undertake the Project, and where necessary should factor the cost of providing this into its bid price. Also please note the limitations in Section 9 Functional Guarantees.
229.	05-05-06		Section-4 Bidding forms.	4-23	2.1.13	2.1.13 Guarantees and Plant Performance.a)The Chemicals usage for each of the 6 MLD train and the full plant; Query: Wish to highlight that it is unusual to guarantee section wise guarantees like chemicals for each train . Kindly clarify if it would suffice to guarantee the overall system system parameters which is the usual practice.	Refer Revised Bidding Document : Section 9: COF: Appendix 7: Functional Guarantees

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230.	05-05-07		Section-4 Bidding forms.	4-24	2.1.14	2.1.14 Operation Services:b) To meet legal and statutory requirements in Sri Lanka, Kindly clarify what these specific requirements are other than whats covered under this heading. For item l) it would be very useful if you could kindly clarify the list of such approvals needed that the contractor is responsible for obtaining.	The Contractor must comply with the laws of the country within which it works and any regulations and codes that emanate from these laws. These matters cover social, environmental, commercial and safety requirements.
231.	05-05-08		Section-4 Bidding forms.	4-44		Historical financial statements must be audited by a certified accountant.: Query : In situations where the bidders country of origin may have a different timing for financial year such as December 31st, and the audited results may not be ready for 2016, Kindly clarify that the annual results published in the public domain would be enough in such situation.	The Contract stands as it is.
232.	05-05-09		Section-4 Bidding forms.	4-68		C. Schedule 5.2: Contractor's Variable Rate:1. The Contractor's Variable Rate (CVR) covers output-related O&M costs including chemicals and other consumables, power to run the high lift pumps.Query: Its not clear why the power to run high lift pumps is part CVR given that power supply is in the scope of employer. Kindly clarify.	The Contractor shall pay the CEB for the electricity and shall in due course be reimbursed by the Employer. This transaction is expected to occur monthly. The Contractor is expected to have enough working capital to undertake the Project, and where necessary should factor the cost of providing this into its bid price. Refer Revised Bidding Document : Section 9: COF: Appendix 7: Functional Guarantees
233.	05-05-10		Section-4 Bidding forms.	4-69		C. Schedule 5.3: The Contractor shall note that damages are payable if the assessed leakage in the transmission main between the plant and monitoring station at "Puthukkadu Junction" exceeds the amount specified in the Schedule of Guarantees.Query: Given that the transmission line work scope of the bidder is DB, its not clear why the responsibility to guarantee the leakages of transimission pipeline during the O&M period is in the scope of the contractor. We think it should not be. Kindly confirm.	Refer Revised Bidding Document : Section 9: COF: Appendix 7: Functional Guarantees

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234.	05-06-01	Pre-Bid Meeting Presentation Slide	-	2	Asset Breakdown (slide 4)	Kindly confirm Pre-Bid Meeting slides shall prevail and supersede the requirements in tender document (Section 6) cited below, where the Operation, Maintenance and reporting requirements of the DBO Contractor shall only be up to the point before Product Water Tank 10ML.	The pre bid meeting slides are for guidance only. It will not supersede any of the Contract document. Bidder shall refer to Revised Bidding Document and Answers to Queries only.
235.	05-06-02	Pre-Bid Meeting Presentation Slide	-	3	Downstream Infrastructure (slide 5)	With reference to the presentation slides of Jaffna Desalination Plant and Associated Works Pre-Bid Meeting, held on 16 Feb 2016 at Colombo, Sri Lanka: Slide 4, Operate and Maintain responsibility excludes the Product Water Storage and Transfer Works (namely Storage Tank, Pump Station, Transmission Pipeline, Connection to Existing Transmission Main) and Site Access Works (namely New Access Road, Upgrade Existing Access Road, Waterway Crossings - Lagoon, Waterway Crossings - Culverts). Slide 5, Limit of O&M Contract is before Product Water Tank 10ML.	
236.	05-06-03		6	6-111	16.8	Slide 5, Limit of O&M Contract is before Product Water Tank 10ML.	
237.	05-06-04		6	6-117	16.12.8.4	With reference to Section 6 Employer's Requirements: clause 16.8, "The Bidder will be responsible for the operation, maintenance and repair of the potable water pump station, the potable water transfer line and all equipment and auxiliary facilities associated with their normal functioning. clause 16.12.8.4, "The potable water and process water transmission pipelines shall be maintained in accordance with Standard Industry Practices. If the lines develop a leak or otherwise fail, the Bidder shall manage and oversee the repair and restoration..."	

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238.	05-06-05	Pre-Bid Meeting Presentation Slide	-	6	Produce Water (slide 12)	<p>"• The quantity will be measured by a flow meter to be installed upstream of the interface point"</p> <p>During Operation Service Period, please confirm the interface point being "Product Water Tank 10ML", as per the Prebid Meeting slide 5, coincide with the Limit of O&M Contract.</p>	Refer Revised Bidding Document. Section 6: ERQ: Chapter 4 – Figure 4.1 and 4.2
239.	05-06-06	Pre-Bid Meeting Presentation Slide	-	6	Produce Water (slide 12)	<p>"• The quality will be measured by (1) online - probes inserted into the pipeline, and (2) samples - both taken between the outlet of the treatment plant and the interface point"</p> <p>During Operation Service Period, please confirm the interface point being "Product Water Tank 10ML", as per the Prebid Meeting slide 5, coincide with the Limit of O&M Contract.</p>	Refer Revised Bidding Document. Section 6: ERQ: Chapter 4 – Figure 4.1 and 4.2
240.	05-06-07		6	6-112	16.10.1 (a)	Please clarify and list the points of delivery in "each of the points of delivery..."	Refer Revised Bidding Document; Section 6: ERQ- Attachment A.2.5.b In Attachment A.2.5.b, the tentative location of "Delivery Point" is marked as "C" at the A9 road B402 road junction.
241.	05-06-08		6	6-113	16.10.2 (a)	Please clarify and list the points of connection in "delivered to the each of the points of connection..."	Refer Revised Bidding Document. Section 6: ERQ: Chapter 4 – Figure 4.1 and 4.2. The interface at Potable Water Tank would be the point of connection.
242.	05-06-09		6	6-121	16.14	Please clarify "Delivery Points for Potable Water as defined in Attachment 2" as only 1 Delivery Point is indicated in Attachment 2, ie. Water Delivery Point at Puthukkadu junction.	Refer Revised Bidding Document; Section 6: ERQ- Attachment A.2.5.b In Attachment A.2.5.b, the tentative location of "Delivery Point" is marked as "C" at the A9 road B402 road junction.
243.	05-06-10		6	6-121	16.14.2 (b)	Please clarify the location of points of delivery "at the points of delivery of the potable water". Please further confirm sampling and testing shall be carried out at before Product Water Tank only during the Operation Service period.	Refer Revised Bidding Document; Section 6: ERQ- Attachment A.2.5.b In Attachment A.2.5.b, the tentative location of "Delivery Point" is marked as "C" at the A9 road B402 road junction. The potable water shall be tested at Potable water tank.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
244.	05-06-11		6	6-122	16.14.2 (d)	Please clarify the location of Delivery Points "measured at the Delivery Points (million cubic meters/month)". Please further confirm the measurement of Daily and Total Potable water flows shall be measured at before the Product Water Tank only during the Operation Service Period.	Total Potable water flows shall be measured at before the Product Water Tank
245.	06-01-01		8	8-2	5.1	Period for notification of errors faults and other defect is 120 days from the Commencement Date. Refer to above clause our understanding is "Date Of Completion" instead of Commencing Date.	The defect notification period commences on the date of the Commissioning Certificate.
246.	06-01-02		8	8-2	14.9	Financing charges for delayed payment: "not applicable" Kindly amend this clause and provide the provision to apply LIBOR.	The Contract stand as it is.
247.	06-02-01		6	1/3	A.4.1 Attachment 4 - Design Review Deliverables	According to the subjective document Duration for Design and Engineering - 8 months. But the slides presented on Pre - Bid Meeting 16-02-2017 shows 6 months kindly clarify	Refer Revised Bidding Document : Section 6: A.4.1
248.	06-02-02		1	1-15	23.1 (a)	Refer to slides presented on Pre - Bid Meeting 16-02-2017 "in addition to Original Bid, 5 copies shall be submitted "But subjective clause mentions only "Original & Copy" kindly confirm the required numbers of copy to be submitted.	One original and five copies are required. Refer Revised Bidding Document : Section 2: BDS: 22.1
249.	06-02-03		4	4-69 to 4-84	Schedule of Rates and Price	Kindly provide the Excel version	Bidder shall develop their own.
250.	06-02-04		4	4-11	2.1.3 (iii)	There is a provision to propose alternative system. But ITB 13.1 mentions "Alternative bids are not permitted." kindly clarify	Alternative bids are not permitted. Refer Revised Bidding Document
251.	06-02-05		4	4-69 to 4-84	Schedule of Rates and Price	Is there a any possibility to submit the bid price in single currency. Please confirm.	Refer Revised Bidding Document. Section 2: BDS: ITB 19.1
252.	06-02-06		8	8-2	5.1	Kindly provide the defect liability period.	The FIDIC Gold Book is being used for this Contract. Refer Sub Clause 12

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer																															
253.	06-03-01					<p>2.4 Bidder's Experience</p> <p>2.4.1 Contracts of Similar Size and Nature</p> <table border="1"> <thead> <tr> <th rowspan="2">Criteria Requirement</th> <th colspan="3">Compliance Requirements</th> <th rowspan="2">Documents Submission Requirements</th> </tr> <tr> <th>Single Entity</th> <th>All Partners Combined</th> <th>Joint Venture Each Partner One Partner</th> </tr> </thead> <tbody> <tr> <td>a. Participation in four (4) contracts that are similar to the Design and Build portion of the proposed works: 1) within the last 10 years; 2) that have been successfully completed; 3) with potable water production capacity of 24 MLD or more using SWRO Desalination Process; 4) where the value of the Bidder's participation in Design and Build portion of each contract exceeds USD 50 million.</td> <td>must meet requirement</td> <td>must meet requirement</td> <td>must meet at least one contract requirement</td> <td>Form EXP - 1a</td> </tr> <tr> <td>b. Participation in two (2) contracts that are similar to the Design and Build portion of the proposed works: 1. Outside the Bidder's home country; 2. within the last 10 years; 3. that have been successfully completed; 4. with potable water production capacity of 24 MLD or more using SWRO Desalination Process; 5. where the value of the Bidder's participation in Design and Build portion of each contract exceeds USD 50 million.</td> <td>must meet requirement</td> <td>must meet requirement</td> <td>must meet at least one contract requirement</td> <td>Form EXP - 1b</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th rowspan="2">Criteria Requirement</th> <th colspan="3">Compliance Requirements</th> <th rowspan="2">Documents Submission Requirements</th> </tr> <tr> <th>Single Entity</th> <th>All Partners Combined</th> <th>Joint Venture Each Partner One Partner</th> </tr> </thead> <tbody> <tr> <td>c. Participation in one (1) contract where the Bidder has a minimum experience of 7 years of O&M Services: 1) within the last 10 years; 2) that are similar to the proposed works; 3) with a plant availability time of 93% or greater; 4) with potable water production capacity of 24 MLD or more using SWRO Desalination Process</td> <td>must meet requirement</td> <td>not applicable</td> <td>must meet requirement</td> <td>EXP - 1c</td> </tr> </tbody> </table> <p>The similarity of the Bidder's participation shall be based on the physical size, nature of works, complexity, methods, technology or other characteristics as described in Section 6 CI 1.3, Employer's Requirements.</p>	Criteria Requirement	Compliance Requirements			Documents Submission Requirements	Single Entity	All Partners Combined	Joint Venture Each Partner One Partner	a. Participation in four (4) contracts that are similar to the Design and Build portion of the proposed works: 1) within the last 10 years; 2) that have been successfully completed; 3) with potable water production capacity of 24 MLD or more using SWRO Desalination Process; 4) where the value of the Bidder's participation in Design and Build portion of each contract exceeds USD 50 million.	must meet requirement	must meet requirement	must meet at least one contract requirement	Form EXP - 1a	b. Participation in two (2) contracts that are similar to the Design and Build portion of the proposed works: 1. Outside the Bidder's home country; 2. within the last 10 years; 3. that have been successfully completed; 4. with potable water production capacity of 24 MLD or more using SWRO Desalination Process; 5. where the value of the Bidder's participation in Design and Build portion of each contract exceeds USD 50 million.	must meet requirement	must meet requirement	must meet at least one contract requirement	Form EXP - 1b	Criteria Requirement	Compliance Requirements			Documents Submission Requirements	Single Entity	All Partners Combined	Joint Venture Each Partner One Partner	c. Participation in one (1) contract where the Bidder has a minimum experience of 7 years of O&M Services: 1) within the last 10 years; 2) that are similar to the proposed works; 3) with a plant availability time of 93% or greater; 4) with potable water production capacity of 24 MLD or more using SWRO Desalination Process	must meet requirement	not applicable	must meet requirement	EXP - 1c	<p>Refer Revised Bidding Document. Section 3: EQC: 2.4</p>
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No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
254.	07-01-01		3	3-6	2.3.2	Requesting to Change As – Minimum average annual turnover of 100million USD calculated as total certified payments received for contracts in progress or completed, for the last five (5) years.	Refer Revised Bidding Document. Section 3: EQC: 2. Qualification
255.	07-01-02		3	3-8	2.4.1 – a	Requesting to Change As- Participation in Two (2) Contracts more than 19 MLD	Refer Revised Bidding Document. Section 3: EQC: 2.4.1
256.	07-01-03		3	3-8	2.4.1 –a-3	Requesting to Change As- Potable / Industrial Water Production Capacity of 19 to 24 MLD or More	Refer Revised Bidding Document. Section 3: EQC: 2.4.1
257.	07-01-04		3	3-8	2.4.1 –a-4	Requesting to Change As- Bidder total Participation in all Contracts is more than USD 30 Million	Refer Revised Bidding Document. Section 3: EQC: 2.4.1
258.	07-01-05		3	3-8	2.4.1 – b	Requesting Client to Change this Clause as- Supply Contracts should be Overseas from the Bidder's country that have been successfully completed total capacity of all plants should be 24 MLD SWRO Desalination Plant or more, or where the value of the Bidder's participation exceeds USD 70 Million.	Refer Revised Bidding Document. Section 3: EQC: 2.4.1
259.	07-01-06		3	3-9	2.4.1 – c	Requesting to Change As- Bidder has a minimum Experience of 2 years	Refer Revised Bidding Document. Section 3: EQC: 2.4.1
260.	07-01-07		3	3-9	2.4.1 – c-4	Requesting to Change As- Potable/Industrial Water Production Capacity of 19 to 24 MLD or More	Refer Revised Bidding Document. Section 3: EQC: 2.4.1
261.	08-01-01		Chapter 6: Pre-treatment Facilities		6.1.2 Ultrafiltration System	Bidder must be allowed to choose between Submerged and pressurised Ultrafiltration rather than only having submerged ultrafiltration	Refer Revised Bidding Document. Section 6: ERQ: Chapter 6 – Pre Treatment

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
262.	08-01-02		Chapter 2: Water Characteristics and Design Parameters		Table 2.2 – Sea Water Parameters	We understand that the plant has to be designed for a TDS of 35000 ppm. However, the design temperature for RO is not available. Request to provide the same as it is a very important factor to design the RO high pressure pumps	Refer Revised Bidding Document. Section 6: ERQ: Chapter 2 – Table 2.2
263.	08-01-03		Chapter 2: Water Characteristics and Design Parameters		Table 2.2 – Sea Water Parameters	We understand that the plant is to be designed for 35000 ppm. The power cost of O&M portion will be based on this TDS. However, we understand that bidder is free to claim extra money in case the TDS value goes above 35000 ppm	The data collected by the Employer has been made available to the Bidders – this data is limited to the period of sampling and the number of samples taken and may not be fully representative of the full data set. The Bidders are requested to immediately undertake further sampling upon award of contract to better inform themselves of the sea water quality
264.	08-01-04		Section 6 – Employer's Requirements		Table 115.1 Schedule of Guarantees	There is an ambiguity over the guaranteed power usage as under the table 15.1 it says 3.8 and under the table 15.4 it says 3.5. We understand that it is 3.8 kWh/m ³ . Please confirm our understanding.	The limit for the power has been set at 3.8 kWh/m ³ .
265.	08-01-05		Section 6 – Employer's Requirements		1.3.5 Potable water storage and conveyance system	We understand that the potable water conveyance system has to be designed for 48 MLD and not 36 MLD. Please confirm our understanding.	The potable water conveyance system must be design for 36 MLD. An additional pipeline will be built in the future to transfer the additional 12 MLD. This additional pipeline and its connection point are not in this contract.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
266.	08-01-06		Section 6 – Employer's Requirements		Design of electrical and instrumental system	We understand that the complete electrical and instrumentation has to be designed for 48 MLD. Please confirm our understanding	<p>The plant that is constructed must have:</p> <ol style="list-style-type: none"> (1) Fully installed equipment to provide 24 MLD (2) Space and connection points for a further 24 MLD (3) Space and connection points for additional equipment to reduce the Boron from 2.4 mg/l to 1 mg/l (4) Space and connection pints for a DAF plant. <p>The intention of the design is to make provision for these four items so that only equipment (such as additional pumps, membranes or instruments) need to be installed to achieve the specified augmentations.</p>
267.	08-01-07		Section 6 – Employer's Requirements		1.2.1 Plant Production Capacity	We understand that plant availability has to be 96% throughout the year. We recommend NWSDB to make mandatory a stand by unit of 6 MLD as RO unit goes for CIP every 3 months and it is also advised to have a stand by unit	The Bidder is to determine how the reliability of the plant will be achieved. The Bidder is to show how the reliability will be achieved in its submission. This will be assessed by the Bid Evaluation Panel.
268.	08-01-08		Section 6 – Employer's Requirements		3.2.2 Construction Services	We request NWSDB to let the bidder decide the prorated guarantee of RO membranes as it varies RO membrane vendor wise	Membranes that are replaced under five years will be replaced at the Contractor's cost. Membranes replaced after this time will be replaced from the Asset Replacement Fund.
269.	08-01-09		Section 6 – Employer's Requirements		Discharge Water Standards	We understand the salinity of the RO reject will be measured after it gets mixed with the Sea water	A quantity and quality of the RO reject water are to be measured before it enters the sea.
270.	08-01-10		Section 2 – Bid Data Sheet		ITB 18.3	We understand that all the taxes and duties will be borne by the employer in the employer's country	Refer Revised Bidding Document. Section 2: BDS; ITB 18.4(a)(ii) Section 8: PCC: PCC 14.1

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
271.	08-01-11		<p>Section 3 – Evaluation and Qualification Criteria</p> <p>a. Participation in four (4) contracts that are similar to the Design and Build portion of the proposed works:</p> <p>Within last 10 years</p> <p>1) That have been successfully completed</p> <p>2) With potable water production capacity of 24 MLD or more using SWRO Desalination Process</p> <p>Where the value of the bidder's participation in Design and Build portion of each contract</p>		<p>2.4 Bidder's Experience</p> <p>2.4.1 Contracts of Similar Size and Nature</p>	<p>We have gone through the ADB and local guidelines for pre-qualification and understood that the laid criteria in the tender is not as per them and it is favouring very few bidders. We request you to have a relook at it and instead of 4 plants please allow to have 2 plants (As per ADB guidelines). This will help NWSDB to have achieve the lowest possible bid.</p>	<p>Refer Revised Bidding Document. Section 3: EQC: 2.4</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
272.	08-01-12		<p>Section 3 – Evaluation and Qualification Criteria</p> <p>b. Participation in two contracts that are similar to the Design and Build portion of the proposed works:</p> <ol style="list-style-type: none"> 1) Outside the bidder's home country 2) Within last 10 years 3) That have been successfully completed 4) With potable water production capacity of 24 MLD or more using Desalination Process <p>Where the value of the bidder's</p>		<p>2.4 Bidder's Experience</p> <p>2.4.1 Contracts of Similar Size and Nature</p>	<p>We have gone through the ADB and local guidelines for pre-qualification and understood that the laid criteria in the tender is not as per them and it is favouring very few bidders. We request you to have a relook at it and instead of 2 plants please allow to have 1 plant (As per ADB guidelines). This criteria is limiting the tender to a few people leading to a much higher price to the government. Hence we suggest to have one plant (out of two) outside the bidder's country.</p>	<p>Refer Revised Bidding Document. Section 3: EQC: 2.4</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
273.	08-01-13		<p>c. Participation in one (1) contract where the bidder has a minimum experience of 7 years of O&M services:</p> <ol style="list-style-type: none"> 1) Within the last 10 years 2) That are similar to the proposed works 3) With a plant availability time of 93% or greater <p>With potable water production capacity of 24 MLD or more using SWRO Desalination process</p>		<p>2.4 Bidder's Experience</p> <p>2.4.1 Contracts of Similar Size and Nature</p>	<p>We suggest that bidder shall be allowed to claim a contract with 7 years rather than 7 years' experience in the last 10 years as it is not logical to ask for 7 years' experience in the last 10 years</p> <p>Reiterating this will again help in attracting competition and help NWSDB to get the best possible lowest quote.</p>	<p>Refer Revised Bidding Document. Section 3: EQC: 2.4</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
274.	09-01-01		Section 6. Employer's requirement	pag11		<p>The figure depicted in 6-11 shows a site of 150 m x 200 m. However, in "Attachment 2 - SWRO Plant Site and Potable Water Conveyance Route Related Information" of the tender documents, the site shown in the DWG files has the following dimensions: 200 m x 200 m.</p> <p>Please confirm dimensions of the proposed site.</p>	The proposed site is 200m X 200m
275.	09-01-02		Section 6. Employer's requirement. Chapter 6. 6.1.2. Ultrafiltration system	pag 69-70		<p>According to our experience submerged UF is not a conventional membrane pre-treatment system for SWRO. The last years tendency in SWRO is to use pressurized UF as pre-treatment alone or in combination with other stages. In addition, pressurized UF will provide the same quality of pre-treated seawater in terms of SDI, viruses and bacteria than submerged UF.</p> <p>By other hand, the table in page 6-70 of alternative pre-treatments, does not show the option DAF + pressurized UF, and therefore we are in doubt as whether the base case is required with submerged UF or it is open to both types of UF systems.</p> <p>Could you please confirm that pressurized UF would be accepted for the Base Case Pretreatment?</p>	Refer Revised Bidding Document. Section 6: ERQ: Chapter 6 - Pre-treatment Chapter 2: Table 2-3
276.	09-01-03		Bidding forms Section 4 – question 15	Pag 5		<p>Could you please confirm that the mentioned recovery of 45% applies to the complete desalination plant and not only to the RO system?</p>	The recovery only refers to the RO system.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
277.	09-01-04		Section 6. Employer's requirement Chapter 2. 2.1.2.1 Surface Water Runoff during the Monsoon Season	pag 6.25		Please indicate which maximum value of hydrocarbons has to be taken into account for design.	Hydrocarbons have not been detected in sampling undertaken to date. Refer Revised Bidding Document. Section 6: ERQ; Chapter 2, Clause 2.1.1, The data collected by the Employer has been made available to the Bidders – this data is limited to the period of sampling and the number of samples taken and may not be fully representative of the full data set. The Bidders are requested to immediately undertake further sampling upon award of contract to better inform themselves of the sea water quality
278.	09-01-05		Section 6. Employer's requirement 1.3.3. RO system	pag 6.15		Please confirm whether the number of future RO 2 nd pass trains (for future space provision) is the Bidder's decision.	Yes this is the bidder's decision. It is expected that the bidders may wish to use less membranes and produce a blended water.
279.	09-01-06		Section 6. Employer's requirement 1.3.4. Post-treatment	pag 6.15		Please confirm whether another disinfection system as sodium hypochlorite is possible	Sodium hypochlorite is to be used for disinfection and the control of biological growth throughout the plant. Chlorine gas is to be used for disinfecting the product water.
280.	09-01-07		Section 6. Employer's requirement Chapter 3. Key Engineering, Procurement and Construction Tasks	pag 6-31		Please indicate which underground structures, piping and other facilities have to be removed and/or recycled in the plot area.	The SWRO Plant site has no existing surface or subsurface facilities, structures, buildings and piping which will need to be removed or relocated.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
281.	09-01-08		Section 6. Employer's requirement 3.8.2.2 piping and valves	pag 6.52		According to our experience a higher velocity in metallic pipes is possible. Please confirm whether a higher velocity could be considered in design	This is an Employer's requirement.
282.	09-01-09		Section 6. Employer's requirement 7.2.1 RO Feed conditioning facilities	Pag 6- 77		In case another pretreatment system than media filters is proposed. Please confirm whether cartridge filters shall be used in any case.	Refer Revised Bidding Document. Section 6: ERQ: Chapter 6 - Pre-treatment Chapter 2: Table 2-3
283.	09-01-10		Section 8. Particular Conditions of Contract	Page 1		Please kindly confirm the project is in turnkey basis for the Design Build and Operate of the SWRO plant, not a Cost Plus Profit Project.	This applies to some items, such as provisional sums, where it is pertinent to for the Contractor to add a percentage to an at cost item.
284.	09-01-11		Section 4. Bidding Forms. Schedule 4.3.	Page 76-77		Please, kindly confirm the Provisional Sums included in the schedule 4.3 must be included as fixed costs in the Item 10. Hence, Item 11 (Grand Summary) is Item 9 + Item 10.	Refer Revised Bidding Document. Section 4: BDF: Schedule 4.3 and 7
285.	09-02-01		13.4	Page 1-9		According to the bidding documents, alternative technical solutions for the pre-treatment system are allowed under certain circumstances. Could you please confirm that in case of choosing an alternative pre-treatment solution, the base case would not need to be designed, described and priced?	Refer Revised Bidding Document. Section 6: ERQ: Chapter 6 - Pre-treatment Chapter 2: Table 2-3
286.	09-02-02		Section 6. Employer's requirement 6.1.4 Alternative pre-treatment system	Page 6-70		Please confirm that an alternative pretreatment could be proposed as base case if one of those scenarios is met.	Refer Revised Bidding Document. Section 6: ERQ: Chapter 6 - Pre-treatment Chapter 2: Table 2-3

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
287.	09-02-03		Section 6. Employer's requirement 3.8.2.2 piping and valves	Page 6-52		Please kindly confirm that this velocity criteria of 2 m/s shall be fulfilled for the whole pipes except for permeate pipes (velocity of 2.5 m/s)	This is an Employer's requirement.
288.	09-02-04		Section 6. Employer's requirement Chapter 6. 6.1.1.DAF clarifiers	Page 6-69		Please kindly confirm the value of 35 m ³ /m ² /h (with two DAF units out of service) as it seems to be slightly high for a proper operation. In addition, this value is more restrictive than 25 m ³ /m ² /h (with all DAF units in service) and determines the final design of the DAF system	Refer Revised Bidding Document. Section 6: ERQ: Chapter 6 - Pre-treatment Chapter 2: Table 2-3
289.	09-02-05		Section 6. Employer's requirement Chapter 7. Reverse osmosis system	Page 6-76		Please kindly confirm if the space for a future second pass to process 100% of the first-pass permeate is for potable water production of 48 MLD.	Refer Revised Bidding Document. Section 6: ERQ: Chapter 3, Clause 3.7.3 Section 3: EQC Table 3-3
290.	09-02-06		Section 6. Employer's requirement 1.3.4. Potable Water post-treatment	Page 6-16		Please kindly confirm if the floor space for future installation of Ultra-violet (UV) treatment stage is for potable water production of 48 MLD.	Refer Revised Bidding Document. Section 6: ERQ: Chapter 3, Clause 3.7.3 Section 3: EQC Table 3-3
291.	09-02-07		Section 6. Employer's requirement 3.7.3. Expandability	Page 6-48		Please kindly confirm if the collectors among different parts of the plant should be already prepared for the future expansion to 48 MLD.	Refer Revised Bidding Document. Section 6: ERQ: Chapter 3, Clause 3.7.3 Section 3: EQC Table 3-3

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
292.	09-02-08		Section 6. Employer's requirements. Chapter 3. 3.7.3. Expandability	Page 6-48		For the expansion purposes space must be identified, specially for RO, UF or DAF equipments. Could you please confirm that RO/UF and DAF buildings can be constructed for the actual capacity, while sufficient area adjacent to such buildings is left prepared for future expansion?	Refer Revised Bidding Document. Section 6: ERQ: Chapter 3, Clause 3.7.3 and 7.1 Section 3: EQC Table 3-3
293.	09-02-09		Section 6. Employer's requirements. Chapter 4. 4.1. Site plan	Pages 6-64, 6-65		We have noticed that pages 6-64 and 6-65 are missing. Could you please send those missing pages ?	Refer Revised Bidding Document.
294.	09-02-10		Section 6. Employer's requirements. Chapter 7. 7.2.2 RO Membrane Trains	Page 6-77		The requirements for the RO trains state that average membrane flux shall not exceed 14 l/mh with all trains in operation neither 16 l/mh with one train out of service. Taking into account the trains capacity, such fluxes don't match. N trains workin at 14 l/mh will result in 18.6 l/mh for the case of N-1 trains; while 16 l/mh for N-1 trains will translate in 11.8 l/mh for N trains. Said so, we understand that the design of the RO should be such that the limitation of 14 l/mh is respected, but flux when N-1 trains operating, is limited according to the RO membrane suppliers guarantee terms. Could you please confirm?	The average design SWRO membrane flux of the SWRO elements per pressure vessel shall not exceed 14 L/mh with all four RO trains in operation and RO train production capacity of 250 m ³ /hr. Refer Revised Bidding Document; Section 6:ERQ: Chapter 7.2.2 (e)
295.	09-02-11		Section 6. Employer's requirements. Chapter 7. 7.2.2 RO Membrane Trains	Page 6-77		Regarding the sentence "operation at the same production capacity per train, with one train out of service", please confirm that it should say "operation at the same whole production capacity, with one train out of service".	The sentence stands as it is. The total production remain same as 24 MLD. During the operation of 4 trains and also with one train out of service.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
296.	09-02-12		Section 6. Employer's requirement. 14.1.1 Connection of SWRO Desalination Plant to Power Supply System	Page 6-101		<p>Please, could you clarify the battery limit? Where is the interconnection point (site and voltage)?</p> <p>In order to design the electrical system, would you mind telling us the short-circuit current (expected value) at the interconnection point?</p> <p>Please, kindly also provide the value of earth fault current and the tripping time.</p> <p>We understand that the tariff metering equipment will be installed at the 33kV incomers. Please, kindly confirm</p>	<p>Refer Revised Bidding Document;</p> <p>Section 6: ERQ: Chapter 14.</p> <p>Section 9: COF: Performance Guarantees</p>
297.	09-02-13		Section 6. Employer's requirement. 14.1.2	Pag 6-101		<p>Bidding document define 33kV for the interconnection point and 440V/230V for low voltage distribution. Could it be a mistake and low voltage distribution level is 400/230V?</p>	<p>Yes. It is 400/230 V.</p> <p>Refer Revised Bidding Document.</p> <p>Section 6: ERQ – Chapter 14.</p>
298.	09-02-14		Section6 – Employer's Requirements ,Clause 9.1 Works Description	page 6-83		<p>To define properly the transmission line as well as the pumping station (design working pressure, surge protection if necessary) we need to define the characteristics of the water delivery point (mainly pressure at the delivery point and type of connection point (well, pipe, tank). Kindly request to provide the aforementioned information.</p>	<p>Refer Revised Bidding Document.</p> <p>Section 6: ERQ;</p> <p>Chapter 9 – Sub Clause 9.1 Attachment A.2.5.a and A.2.5.b</p> <p>In Attachment A.2.5.b, the tentative location of "Delivery Point" is marked as "C" at the A9 road B402 road junction.</p>
299.	09-02-15		Attachment 2			<p>Please confirm that the potable water transmission main is defined by nodes A, D, G, F, E, and C (7.963,35 m long).</p>	<p>This is a proposed route only. Bidder shall propose any feasible alternatives as well.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
300.	09-02-16		Attachment 2			<p>Please clarify the following questions regarding the pipelines:</p> <ul style="list-style-type: none"> - What's the meaning of nodes B, H and J? - Is profile A-B a part of the routing of the raw water main and brine outfall pipe? - What's the purpose of section H-J, is just a road or a pipeline routing to be constructed under the contract? <p>We kindly request to clarify what are exactly the works to be constructed under the sections defined by the nodes in drawings in Attachment 2: roads, pipes, diameters, etc.</p>	The junctions and nodes are marked with "A,B,C..... J". Those are not indicating any route for the pipe lines.
301.	09-02-17		Document A.2.2. Report on geotechnical site investigations of Attachment 2	Page 3		Is a road to be constructed from the plot of the plant to the Thalayadi Border? Kindly clarify what are the requirements for such a road in the sand beach.	Refer Revised Bidding Document. Section 6: ERQ; Chapter 1: 1.3.7 (u), 3.7.10 and Attachment 2 (A.2.1.b)
302.	09-02-18		Section 4- Bidding Forms, Schedules of prices	Page 4-70,		Please clarify what it is expected to be quoted under the items called "ditto" in Schedules of prices 1, 2, 3 (it is quoted twice in this schedule), and 4.2.	The forms designate the format that is required to be used to provide the information required by the Employer. 'Ditto' means 'as has been said before': The bidder shall add additional items to the list.
303.	09-02-19		Section 6 – Employer's Requirements ,Clause 1.2.2 Works description	Page 6-12		In Document A.2.2. of Attachment 2 distance from the shore for the disposal pipe is 700 m. Please confirm that the minimum distance to the shore to be kept for the brine outfall is 500 m.	Refer Revised Bidding Document. Section 6: ERQ; Sub Clause 1.2.2
304.	09-02-20		Section 4 – Bidding Forms, Form AT1-LTB	Page 4-5		In Document A.2.4 of Attachment 2 it is recommended that distance of 400 m from intake well to discharge structure is to be kept. Please clarify what is the minimum distance to be kept between intake well and discharge structure.	Refer Revised Bidding Document. Section 6: ERQ; Sub Clause 1.2.2

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
305.	09-02-21		Section 6 – Employer's Requirements ,Clause 1.2.2 Works description	Page 6-12		In Document A.2.4 of Attachment 2 it is recommended that distance of 900 m from intake to the shore is to be kept. Please clarify what is the minimum distance to be kept between the shore and the intake well.	Refer Revised Bidding Document. Section 6: ERQ; Sub Clause 1.2.2
306.	09-02-22		Section 6 – Employer's Requirements , Clause 1.3.5 Potable Water Storage and Conveyance System	Page 6-16		As the required pumps have exactly the total capacity required for the pump station (36 MLD), it is supposed that no more stand-by pumps are required. Please confirm that the total number of pumps is 2x6 MLD + 2x12 MLD for the present stage.	Only 2 X 6 MLD and 2 x 12 MLD Pumps shall be installed. But Suction and delivery pipework for 2 X 6 MLD and 3 x 12 MLD. Refer Revised Bidding Document. Section 6: ERQ : 1.3.5
307.	09-02-23		Document A.2.4. Interim report of Attachment 2	Page 10		Please provide LAT, MSL and HAT to be considered in the design.	LAT - Lowest Astronomical Tide (The lowest tide which can be predicted to occur. Modern charts use this as the chart datum) MLWS - Mean Low Water Spring (The average of the two low tides on the days of spring tides) MLWN - Mean Low Water Neap (The average of the two low tides on the days of neap tides) MSL - Mean Sea Level (This is the average sea level. The MSL is constant for any location over a long period) MHWN - Mean High Water Neap (The average of the two high tides on the days of neap tides) MHWS - Mean High Water Neap (The average of the two high tides on the days of spring tides) HAT - Highest Astronomical Tide (The highest tide which can be predicted to occur. Note that meteorological conditions may add extra height to the HAT)

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
308.	09-02-24		Document A.2.4. Interim report of Attachment 2	Page 38		Please provide the requirements for the design in the intake tower, such as navigation clearance.	The intake tower is to be located as depicted in the bidding document. The constraints that apply to its design are also found in the EIA-Environmental considerations. Apart from these and the location marker there are no navigational limitations. Refer Revised Bidding Document. Section 6: Chapter 5, Attachment A.2.3 and A.2.4
309.	09-02-25		Document Bidding Document, Section 6, Chapter 9, Clause 9.1	Page 6-83		Could we design the material for potable water transmission line? Please clarify.	Ductile iron has been specified. This is an Employer's requirement.
310.	09-02-26		Document Bidding Document, Section 6, Chapter 9, Clause 9.4	Page 6-85		Kindly Clarify: - Delivery time for this approval How much is the provisional sum	The cost of obtaining the various regulatory approvals and permits has been included as a provisional sum. There is no time allowance in this cost.
311.	09-02-27		Document Bidding Document, Section 6, Chapter 9, Clause 9.4	Page 6-85		Kindly confirm RHS is the correct side for the potable water transmission line. In the same way, kindly confirm permits from other authorities (electrical company, telephone company, private areas) will be granted before commencing.	Refer Revised Bidding Document. Section 6: Chapter 9: 9.4 The final pipeline alignment will be determined as part of the detailed design, which can only be completed after walking the general alignment. It is expected to be contained within the road reserve. The pipeline may need to cross the road in order to avoid areas which may make construction difficult.
312.	09-02-28		Document Bidding Document, Section 6, Chapter 3, Clause 3.5.1	Page 6-44		Is there any auxiliary plot together to the plant for temporary facilities or do they have to be built inside of the plot?	No auxiliary plots. All have to be within the plant site.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
313.	09-02-29		“Special Conditions of contract; 2.part B: Special Provisions Sub clause 14.10 “Payment of retention Money”	8-18		- Upon the clause 14.10 of “special conditions of contract” The employer declares that the contractor can issue a bank guarantee to replace the second half of the Retention Money. In order to improve the cash flow during the Design-build period, kindly consider the possibility of replacing the first half of the Retention Money for a Bank guarantee which amount would be equivalent to the 5% of the LoA Design-build Price from the commencement date.	The Contract stands as it is.
314.	09-02-30		4.2.“Particular conditions of contract”	8-2		- In the clause 4.2 of “Particular Conditions of contract” the amount of the Performance Security to be issued by the contractor is 8% of the LoA Desing-build Price and it will be reduced to 2% of the LoA Desing-build Price at the issue of the Commissioning Certificate and returned at the completion of the retention period. Kindly confirm that the performance Security for the design – build period will be returned at the end of the retention period.	The Contract stands as it is. Refer Revised Bidding Document. Section 8: PCC : Part A: 4.2 and Part B:4.2
315.	09-02-31		Section 2 Bid Data Sheet ITB 11.2 (k)	2-2	The Bidder shall submit with its Technical Bid the following additional documents: - A written authority to seek references from the bidder’s bankers	Please, kindly clarify which kind of document or letter the bidder must submit with its Technical Bid.	This document is a simple statement that the bidder agrees to the Employer seeking references from the bidder's bankers. Given that financial information is confidential the Employer will not be able to obtain this form of reference otherwise. It must be appreciated that the Employer wishes to ensure the financial stability and capacity to support the Project.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
316.	09-02-32		BDS. ITB 11.2 (k)	Section 2. Bid Data Sheet		<p>Please kindly clarify if alternatively a letter of intend to execute a JV agreement and proposed JV agreement would be valid as per clause 11.2 (i)</p> <p>In that case, should the letter of intend certified/attested</p>	If the bidder is a joint Venture, a certified/attested copy of JV agreement or the Memorandum of Understanding and if the bidder is Limited Liability company, a certified/attested copy of the Certificate of Incorporation and if the bidder is partnership, a certified/attested copy of the Partnership Agreement.
317.	09-02-33					<p>Please kindly confirm if document(s) created or originating from outside Sri Lanka, such as work experience certificate(s), Power of Attorney(s) and Financial Certificates shall be compulsorily notarized / attested by an appropriate authority in the Bidder's home country.</p>	Not required. If there any clarification needed, the Employer shall refer the Bidders or the references given in such documents.
318.	09-03-01		Part I, Section 3 – Evaluation and Qualification criteria. 2.3.2 Average Annual Turnover	Page 3-6		<p>It is a common practice among top companies, to have several societies under it undertaking different projects of the same or similar nature. The same is due to either contractual obligations or due to fiscal incentives. It is for this reason that a contractor as such might not be able to fulfil this requirement of minimum average by itself, although the mother company will do.</p> <p>Hence the Contractor request to be allowed to use its mother company credentials in order to fulfil this requirement.</p>	Refer Revised Bidding Document. Section 3: EQC: 2. Qualification and 2.3.2 Average Annual Turnover

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer																				
						<p>The current schedules of payments leaves a very large portion of them to be paid only after commissioning stressing the cashflow of the project for the contractor which would only translate into higher costs for the project. As a matter of fact, Schedule 3 – Design Services, keeps a 20% payment after commissioning. Likewise and Schedule 4 - Build Services, keeps a 30%.</p> <p>The Client already has the retention amount from all the invoices as well as the Performance Bond from the Contractor. Hence it seems more appropriate to keep a 5% payment milestone in the commissioning rather than 20 or 30%, as the current schedule does. This 5% is also in terms with accepted general practices.</p> <p>Beisdes, Under Schedules 1 and 2, it has been observed that there is no milestone payment for installation of goods at site, whilst this is a critical step.</p> <p>For this purpose, we would like to propose the following payment terms and we would request the Client to confirm the same:</p> <table border="1"> <tr> <td>Schedule No. 1</td> <td>Plant and equipment from abroad</td> </tr> <tr> <td></td> <td>Proposal</td> </tr> <tr> <td>Advance Payment</td> <td>10%</td> </tr> <tr> <td>Shipping</td> <td>30%</td> </tr> <tr> <td>delivery at site</td> <td>30%</td> </tr> <tr> <td>Installation</td> <td>25%</td> </tr> <tr> <td>commissioning</td> <td>5%</td> </tr> <tr> <td></td> <td>100%</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>Schedule No. 2</td> <td>Plant and equipment from Employer's country</td> </tr> </table>	Schedule No. 1	Plant and equipment from abroad		Proposal	Advance Payment	10%	Shipping	30%	delivery at site	30%	Installation	25%	commissioning	5%		100%			Schedule No. 2	Plant and equipment from Employer's country	<p style="text-align: right;">95</p> <p>Refer Revised Bidding Document. Section 9: COF: Appendix 1: Terms of Payment</p>
Schedule No. 1	Plant and equipment from abroad																										
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319.	09-03-02		Section 9. – Contract Forms. Appendix 1- Term and Procedures of	Page 9-5 to 9-7																							

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
320.	10-01-01		2 C. Preparation of Bids & 3	2-3 & 3-2	ITB 16.1 (b) & 1.3.3 Operating and Maintenance costs	In the referred clause it is mentioned that period of commissioning is 15 years, whereas in the latter clause Operating and Maintenance (O&M) period is mentioned as 7 years. From the statement, we understand that project duration is 7 years followed by 7 years of O&M. Kindly confirm.	O & M period is 7 years. Refer Revised Bidding Document. Section 2: BDS: ITB 16.1 (b)
321.	10-01-02		9 Appendix - 2	9-12	1) For Price schedule 5.1 – Operation Service – Fixed Fee	The referred clause states price variation formulae applicable for labour & material components for operation services & Asset replacement fund. We request you to consider price variation for Design & Build phase and provide us with applicable formulae. Kindly confirm.	The Contract stands as it is. Refer Revised Bidding Document. Section 9: COF: Appendix 1 & 2.
322.	10-01-03		8	8-4	Retention Money	We request you to accept upfront bank guarantee instead of monthly retention. Kindly consider and confirm.	The Contract stands as it is.
323.	10-01-04		8	8-3	Performanc e Damages	We request you to consider maximum cap as 10% for Performance damage instead of 20%. Please confirm.	The Contract stands as it is.
324.	10-01-05		General	-	Statutory variation	We understand that any variation in taxes and duties and new introduction of tax during due course of construction period shall be borne by the Employer. Kindly confirm	Yes.
325.	10-01-06		General	-	Validity of securities	Kindly provide the validity of Bank Guarantee submitted against Performance Security & Advance Payment Security.	Refer Revised Bidding Document. Section 9: COF

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
326.	10-01-07		General	-	Right of Way	We presume that the required width of ROW shall be provided to us by the client with all permissions & clearances and same shall be free from all encumbrances. Kindly confirm	There are what might be considered as three worksites with this project. These are the intake and outfall works, the treatment plant site, and the transmission pipeline. The Employer will work with the Contractor to provide access to each of these worksites. Clearly the circumstances of each one are different, and will require a different approach. However the Employer has already established the importance of these sites with the various Government agencies. The treatment plant is available and there are not perceived issues with the intake and outfall works. The pipeline is with public reserves but the final alignment has yet to be determined and hence approved by the local authority
327.	10-01-08		3 2.4 Bidder's Experience	3-8	2.4.1 Contracts of Similar Size and nature a, b & c 3)	In the referred clause it is mentioned as " <i>with potable water production capacity of 24 MLD or more using SWRO Desalination Process</i> ". We request you to kindly consider experience of potable water production capacity of 24 MLD or more using any treatment process instead of SWRO Desalination Process. Kindly consider and confirm.	Refer Revised Bidding Document. Section 3: EQC: 2.4.1
328.	10-01-09		3 2.4 Bidder's Experience	3-8	2.4.1 Contracts of Similar Size and nature a, b & c	In the referred clause that it is mentioned that " <i>each partner must meet at least one contract requirement</i> " that are similar to the design & build of the proposed works. If Clarification sought in S. No. 2 is not acceptable, then we request you to accept " <i>must meet requirement with all partners combined</i> "	Refer Revised Bidding Document. Section 3: EQC: 2.4.1

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
329.	10-01-10		3 2.4 Bidder's Experience	3-10	2.4.2 Experience in key Activities (Bidder's capability and capacity) S. No. 1	In the stated clause it is mentioned as "ongoing O&M services of 50 MLD or more supply of drinking water from a SWRO Desalination Plant with a plant availability time of 93% or greater". We request you to kindly consider experience of ongoing O&M services of 50 MLD or more supply of drinking water from any treatment process instead of SWRO Desalination Process. Kindly consider and confirm.	Refer Revised Bidding Document. Section 3: EQC: 2.4.2
330.	10-01-11		3 2.4 Bidder's Experience	3-10	2.4.2 Experience in key Activities (Bidder's capability and capacity) S. No. 2	In the stated clause it is mentioned as "Participation in one contract (i) of a buried off shore sea water intake; and (ii) a buried off shore brine outfall with a diffuser at the outlet located in the sea, both of more than 500m length from the shoreline and for a capacity of 50 MLD or more using SWRO Desalination Plant". We request you to kindly consider experience of Participation in one contract (i) of a surface source water intake; and (ii) surface source water intake for a capacity of 50 MLD or more using any treatment process". Kindly consider and confirm.	Refer Revised Bidding Document. Section 3: EQC: 2.4.2
331.	10-01-12		General	-	-	We request you to consider all necessary permissions and depository fees required for Railway / NH / canal/ SH crossings in client scope. Kindly consider and confirm.	The cost of obtaining the various regulatory approvals and permits has been included as a provisional sum. There is no time allowance in this cost.
332.	10-01-13		General	-	-	We presume that shifting of utilities in in the scope of employer. Kindly confirm if our understanding in correct.	The shifting of facilities will be managed by the Contractor as part of the construction of the works. The Cost shall be borne by the Employer.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
333.	10-01-14		General	-	-	We request you to provide frequency of payment, period for certification and period for payment after certification.	Refer Revised Bidding Document. Section 9: COF: Appendix 1 & 2
334.	10-01-15		General	-	-	We request you to pay interest on delayed amount. Kindly also request you to mention rate of interest for the same.	The Contract stands as it is.
335.	10-01-16		General	-	-	We understand that during Trial run, Operation & Maintenance period chemicals required will be supplied by the Employer. Please confirm if our understanding is correct.	The testing and commissioning is to be undertaken by the Contractor at the Contractor's sole cost. The Contractor should include the costs for this in its bid price.
336.	10-01-17		General	-	-	We understand that during Trial run, Operation & Maintenance period power charges will be borne by the Employer. Please confirm if our understanding is correct.	The testing and commissioning is to be undertaken by the Contractor at the Contractor's sole cost. The Contractor should include the costs for this in its bid price.
337.	10-01-18		6	6-64	4.1	Kindly provide floor area for training centre.	60 m ²
338.	10-01-19		General	-	-	Kindly provide General specifications for civil works like Concrete, steel, Brickwork and architectural finishes.	Refer Revised Bidding Document. Section 6: ERQ: Attachment A.2.7
339.	10-01-20		Section-6	6-16 & 6-83	1.3.5 b) c) & q) & 9.2.1	<p>From the referred clauses, we understand that 2x6 MLD and 2x12 MLD pumps have to be installed.</p> <p>From Clause 9.2.1, we understand that space for additional 12 MLD pump shall be provided to supply 48 MLD of water. But with 2x6 MLD and 3 x 12 MLD pumps, total installed capacity will be 48 MLD without any standby/assist.</p> <p>We presume that additional space for only 1x12 MLD shall be considered. Please confirm.</p>	<p>Only 2 X 6 MLD and 2 x 12 MLD Pumps shall be installed. Space shall be provided for 1 x 12 MLD pump.</p> <p>But Suction and delivery pipework for 2 X 6 MLD and 3 x 12 MLD.</p> <p>Refer Revised Bidding Document. Section 6: ERQ : 1.3.5</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
340.	10-01-21		Section-6	6-16 & 6-83	1.3.5 & 9.1 c)	<p>Clause 1.3.5 states that "Potable water conveyance system shall be designed for minimum 36 MLD capacity..."</p> <p>Clause 9.1 c) mentions 800mm diameter DI pipe has to be considered. However since this project is of DBO nature, we presume that bidder is free to select the diameter of the pipe considering techno-economics of the system for delivering 36 MLD.</p> <p>Please confirm the same.</p>	This is a requirement of the Employer. The Diameter shall be 800mm and pipe material shall be Ductile iron (DI).
341.	10-01-22		Section-6	6-83	9.1	<p>From the referred clause we understand that the delivery point is near Puthukkadu Jn, where the system interconnects with an existing pipeline to Sump at Meesalai.</p> <p>In order to access the operating cost and surge protection of the conveyance system, we require the nature (pumping/gravity), diameter, length, flow (before interconnection point), pipe alignment and material of the existing pipeline.</p>	Refer Revised Bidding Document. Section 6: ERQ: Attachment A.2.5.a
342.	10-01-23		-	-	-	We understand that bidder is free to select the type of cathodic protection for the potable water conveyance pipeline.	Yes.
343.	10-01-24		Section 6 – Employer's Requirement	6-81	8.1 Work Description	As per the referred Clause, Flow meter, Pressure & level transmitter to be provided at the points of delivery of the desalinated water to the JKWSSP. We presume that PLC/RTU system with GSM/GPRS wireless communication to be considered for integration with the Plant control system (SCADA). Kindly clarify & confirm.	The bidder should allow in its price sufficient funds to cover the installation of instruments, communications and SCADA system from the intake structure to the connection point of the transmission pipeline near Puthukkadu Junction (and everything in between). This data collected should be both visible to the Contractor at the plant and also to the NWSDB network operators. Radio communications are preferred.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
344.	10-01-25		Section 6 – Employer's Requirement	6-20 & 6-98	1.3.9.(i) (Instrumentation & Control) & 13.1 (Overall Instrumentation and Control strategy)	As per the referred Clauses, Dual redundant UPS system is to be provided. However battery backup requirement is not mentioned. We presume that "30 minutes battery backup system with single common bank" to be provided. Kindly confirm.	The UPS system should comprise rechargeable batteries and should be connected the electricity supply system for this purpose. Note that critical operational systems are to be connected to a standby generator as well. The UPS should bridge the period between the loss of power and the supply from the generator. 30 minutes should be sufficient.
345.	10-01-26		Section 6 – Employer's Requirement	6-20 & 6-99	1.3.9 (d) (Instrumentation & Control) & 13.2 (Instrumentation & control system requirements)	As per the referred Clauses, we understand LED/LCD Display Based Static MIMIC panel to be provided. Kindly confirm.	A dedicated mimic panel is not required. Rather the SCADA system should use screens to display the SCADA information with a general screen displaying the overall plant (and associated works) operation. This is typical of contemporary plant SCADA systems. A large TV screen should be provided for displaying the plant operation to visitors.
346.	10-01-27		Section 6 – Employer's Requirement	6-18	1.3.7 (t) General site service facilities	As per referred Clause, CCTV coverage of the site is to be provided and connected to screens in the control room. Kindly provide the quantity details of camera to be considered under scope of supply.	The quantity of cameras will depend upon the layout of the plant. Full coverage is required. Bidders will need to consider this in their bids. HDTV cameras are required.
347.	10-01-28		Section 6 – Employer's Requirement	6-19	1.3.8 (c) Ancillary and Support Services	As per referred clause, Fire detection and protection system, smoke detection and alarm system to be provided. Kindly provide the actual quantity requirement of smoke detectors to be considered under scope of supply.	The number of smoke detectors will depend upon the layout of the building and the housing of critical equipment. Please also refer to the Sri Lankan building codes.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
348.	10-01-29		Section 4A – Volume I (Technical Bid)	4-21	2.1.10 Instrumentation & Control	As per referred Clause, Plant communication & Access control system is to be provided. Kindly provide the actual quantity requirement.	As an indication the following is provided. Bidder are to use this as guide only. <ul style="list-style-type: none"> • Internal communications should be via a site-wide WIFI system, mobile phone and internet. • External communications should be by telephone, mobile phone and internet • Access to the site, individual buildings, and critical rooms within buildings should be by swipe cards • Access to hazardous areas, such as high voltage rooms, must be by lock and key • A secure guardhouse must be provided at the entrance to the plant, and a boom gate or similar installed to control vehicles.
349.	10-01-30		General	-	-	We presume that 1.5 Sq.mm Copper cable for digital signal & 1.0 Sq.mm copper cable for analog signal. Kindly confirm.	This is a design consideration for the Contractor.
350.	10-01-31		Chapter 14	156	1.3.10	We understand HT incoming supply will be made available by Ceylon electricity board/client within the plant campus, Bidders scope includes further distribution of power within the plant equipment. Kindly confirm.	Yes. Refer Revised Bidding Document. Section 6: ERQ: Chapter 14, Clause 14.1. The electricity supply will be as follows: <ul style="list-style-type: none"> • one 33 kV high voltage line coming from the CEB grid to a 33kV/1.1 kV substation at the plant site • one high voltage 33kV to 1.1 kV step down substation located at the plant site • the above infrastructure will be provided by the CEB and able to support a 48 MLD plant and a provisional sum is provided for this • power supply within the plant to be provided by the Contractor and able to support a 24 MLD plant to be provided by the Contractor and included in the bid price

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
351.	10-01-32		-	131	5.3	Kindly provide CEB electricity tariff per kwh.	Refer Revised Bidding Document. Section 4: BDF: Price Schedule 5.3.1, 5.3.2 and 5.3.3
352.	10-01-33		Section -6	6	Chapter 14 - 14.1	Kindly provide the fault level, Voltage, frequency and combine voltage & frequency variation of 33kV, 3.3kV and 440V supply system.	The design is responsibility of the Contractor.
353.	10-01-34		Section -4 Section -6	4 & 6	2.1.11 9.2.1	We understand Motors less than 5HP shall be DOL starters. Motors above 5HP to 75 HP -Star shall be Delta starter and Motors above 75HP shall be soft starter. Kindly confirm.	Up to 10 HP use DOL Above that use soft Starter
354.	10-01-35		General	-	-	Please provide the particular specifications for the following equipment Switchyard Equipment Motors Low Voltage and High Voltage Switchgear equipment Variable Frequency drive High voltage and Low voltage cable Earthing and Lightening system Lighting system	The Bidders shall refer to the standards given in Revised Bidding Document; Section 6: ERQ and Attachment A.2.7
355.	10-01-36		6	6-24 6-138	2.1 A.2.3.e	In the referred clause, raw water quality for the design of the plant shall be as per Table 2-1 & Table 2-2. Whereas in clause the document A.2.3.e also given raw water quality measurements. Please clarify whether document A.2.3 is for reference purpose only or missing parameters like BOD, COD, Alkalinity, oil and grease etc shall be taken from the above said document for design.	Missing Parameters in Table 2-1 and 2-2 shall be taken from A.2.3.e

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356.	10-01-37		6	6-64 6-136	4.1 A.2.1.a	In the referred clause, the surface area shall not increase 30,000 m ² . However as per attachment A.2.1.a, AutoCAD dimensions are 201 m x 201 m. Kindly confirm the site area required for 48 MLD plant.	Allocated land plot form SWRO Plant is 200m X 200m
357.	10-01-38		6	6-69	6.1.2	In the referred Clause, submerged type ultrafiltration system is mentioned. Kindly clarify, whether pressurized type of UF system is also acceptable.	Refer Revised Bidding Document. Section 6: ERQ: Chapter 6 - Pre-treatment Chapter 2: Table 2-3
358.	10-01-39		6	6-71	6.1.4	As per the alternatives provided in the table 6-1, standalone pre-treatment system is indicated. No other pre-treatment process shall be envisaged by the bidder apart from that mentioned in each option. Kindly confirm.	Refer Revised Bidding Document. Section 6: ERQ: Chapter 6 - Pre-treatment Chapter 2: Table 2-3
359.	10-01-40		6	6-72 6-27	6.2 2.2	As per the referred clause RO system feed water turbidity mentioned as 0.3 NTU and Instantaneous turbidity as 0.5 NTU. While, Table 2-3 states turbidity as < 0.1/0.5 (Daily Avg/max). As both statements are contradictory to each other. Kindly confirm the Turbidity to be considered for the design.	Refer Revised Bidding Document. Section 6: ERQ: Chapter 6 - Pre-treatment Chapter 2: Table 2-3
360.	10-01-41		6	6-77 6-78	7.2.1	Kindly provide the chemical storage duration recommended for Pretreatment and RO chemicals.	This is a responsibility of the Contractor.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
361.	10-01-42		6	6-78	7.2.2	As per the referred clause "The RO system shall be designed to allow future incorporation of up to 10% more efficient or 10% higher recovery 8-inch RO membranes with minimum or no change of other hardware." We presume that 10% more space for membranes shall be provided for future incorporation. Kindly confirm our understanding.	The wordings stand as it is. It does not mean that to provide additional 10% more space.
362.	10-01-43		6	6-65 6-81	Chapter 5 8.3	Kindly provide the dosing ppm recommended for intake shock and post chlorination for Calcium hypochlorite to enable all bidders to be in same platform.	This is a responsibility of the Contractor. Sodium hypochlorite is to be used for disinfection and the control of biological growth throughout the plant. Chlorine gas is to be used for disinfecting the product water.
363.	10-01-44		6	6-65 6-81	5.1 8.3	As per the referred clause Sodium hypochlorite system shall be used for additional intermittent chlorination of the source sea water. Whereas in clause 8.3, it is mentioned "Calcium hypochlorite system shall be used for potable water disinfection". Kindly confirm whether both statements are as per employer's requirement.	Sodium hypochlorite is to be used for disinfection and the control of biological growth throughout the plant. Chlorine gas is to be used for disinfecting the product water.
364.	10-01-45		6	6-142	A.2.7	Kindly furnish the mentioned documents as the same is not included in the tender documents.	Refer Revised Bidding Document. Section 6: ERQ: Attachments
365.	10-01-46		6	6-143	A.2.8	Kindly furnish the mentioned documents as the same is not included in the tender documents.	Refer Revised Bidding Document. Section 6: ERQ: Attachments
366.	10-01-47		6	6-146	A.3.2	Kindly furnish the mentioned documents as the same is not included in the tender documents.	Refer Revised Bidding Document. Section 6: ERQ: Attachments
367.	10-01-48		6	6-147	A.3.3	Kindly furnish the mentioned documents as the same is not included in the tender documents.	Refer Revised Bidding Document. Section 6: ERQ: Attachments

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
368.	10-01-49		6	6-93	11.1.4	Please specify the number of Quarters required for Engineer executive grade as the number is not indicated.	Two numbers.
369.	10-01-50		6	6-30	2.4	As per table 2-5, outlet TDS should not be more than 1% higher than ambient salinity at 2 meter depth from the shore. Please note that the RO reject along with other waste will not meet this requirement. Please check and revert.	Modelling undertaken by the Employer has shown that if the discharge point is located as specified and the diffuser is well designed close to ambient conditions should be reached within 22 m of the outlet. Refer Revised Bidding Document. Section 6: ERQ: Attachment 2 – A.2.4
370.	10-01-51		6	6-49 6-87	3.7.8 10.1	In the referred clause, Sanitary drainage shall not be released to the sea water. Whereas in the clause 6-87, Sanitary waste water shall be collected with other streams except concentrate and disposed at sea through an offshore plant outfall equipped with diffusers. As above statements are contradictory to each other, please clarify.	The discharge from the onsite human waste treatment facility may be directed into the outfall pipe proving the onsite treatment facility is well maintained.
371.	10-01-52		6	6-90	10.6.1	Please provide Table 10-1 of specifications for discharge retention tank as same is not included in the tender document.	Refer Revised Bidding Document; Section 6: ERQ – Chapter 10.6.1

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
372.	10-01-53		6	6.13 6-69	1.3.2 Chapter 6	<p>As per the referred clause "DAF and UF technologies shall be the base case pre-treatment system."</p> <p>As per second clause, Base case pre-treatment system shall consist of DAF, UF and Cartridge filters.</p> <p>Please clarify whether cartridge filters are part of pre-treatment system.</p>	Refer Revised Bidding Document. Section 6: ERQ: Chapter 6 - Pre-treatment Chapter 2: Table 2-3
373.	10-01-54		6	6-41	3.2.2	<p>Replacement warranty period for RO membranes shall be as per the manufacturer's recommendation. For cartridge filters, HP pumps, ERD, VFDs and pre-treatment warranty shall be as per vendor's recommendation. Kindly confirm.</p>	<p>The warranty period from the manufacturer for any plant and equipment is relevant to the Contractor and always carries a caveat that the plant or equipment is used as intended. The Employer has the same requirement.</p> <p>RO Membranes that are replaced under five years will be replaced at the Contractor's cost. Membranes replaced after this time will be replaced from the Asset Replacement Fund.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
379.	10-01-60		6	6-96	12.4	Kindly furnish local building codes for the design of fire detection and protection system as it's indicated as mandatory to follow local codes.	Please refer to the Sri Lankan building codes
380.	10-01-61		6	6-110	16.3	In the referred clause SDI _{2.5} has been asked for measurement and monitoring of source water. Kindly confirm whether SDI ₃ is sufficient for employer instead of SDI _{2.5}	This is a requirement of the Employer
381.	10-01-62		6	6-24	2.1.1	As per the referred clause total plant recovery is 45% which is on the higher side. We presume that 45% recovery for RO system shall be considered.	The recovery only refers to the RO membranes.
382.	10-01-63		6	6-24	2.1.1	In the referred clause, "the intake source Seawater system shall be designed & constructed by the contractor on the basis of overall sea water recovery of 45 %". We presume it shall be RO recovery .Please confirm.	The recovery only refers to the RO membranes.
383.	10-01-64		6	6-13	1.3.2	In the referred clause, the pretreatment shall Size for 24 MLD Potable water plant. We understand the plant output capacity is 24 MLD accordingly the pretreatment system has to sized by the bidder .kindly confirm.	The plant is to initially deliver 24MLD potable water. Refer Revised Bidding Document. Section 6: ERQ: Chapter 1, Clause 1.2.2 and Chapter 3, Clause 3.7.3 Section 3: EQC: Table 3-3
384.	10-01-65		4 – Bidding Forms	4-68	D. Schedule 5.3	Please let us know the number of days by when employer would reimburse the electricity payments.	This is expected to be monthly in arrears.
385.	10-01-66		4 – Bidding Forms	4-67	B. Schedule 5.1	Please let us know the standard fixed fee items to have a uniform acceptance for all bidders.	A fixed cost is a cost that does not change with an increase or decrease in the amount of goods or services produced. These include labour and labour associated costs, the fixed component of utilities, insurances, permits, licences and cost of ownership. Bidders are to propose their fixed costs.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
386.	10-01-67		4 – Bidding Forms	4-68	C. Schedule 5.2	Request to exclude membrane life component for 5 years as this degradation is due to various causes beyond Contractor's control.	The Contract stands as it is. RO membranes in a well-run plant should last for at least five years. The bidder designed pre-treatment system should ensure this.
387.	10-01-68		6- Employer's requirement	6-111	16.9	Kindly provide the location for the disposal of waste streams.	Refer Revised Bidding Document. Section 6: ERQ: Attachment A.2.8. Table 9.1 - EIA-Environmental Considerations (Waste)
388.	10-01-69		6- Employer's requirement	6-118	16.12.8.5	Request client to suggest proven CMMS Programs in Sri Lanka.	This is a Contractor's responsibility
389.	10-01-70		6- Employer's requirement	6-121	16.14.1	Request to have flow meter calibration as per the frequency specified by the manufacturer only.	Flow meters shall be calibrated once every six (6) months but not less often than the frequencies specified by the respective flow meter manufacturers.
390.	10-01-71		General	-	-	We are sure you will appreciate in the view of extensive and critical scope of work involved, we require sufficient time to assess the site conditions in order to arrive at the suitable methodology to be adopted. In order to prepare competitive technical and commercial bid, we request you to extend the bid submission date by at least 4 weeks. Kindly consider and confirm	An extension of time has been granted
391.	11-01-01	1	3	3 to 6	2.3.2	As per IFB, we have noted the estimated cost of project is 60 Mn US \$. Considering this estimated project cost and project duration of 24 months, we feel that annual turn over criteria of 100 Mn US \$ is very high. We request you to revise the same as 48 Mn US \$ (80% of 6 Mn US \$). Please confirm	Refer Revised Bidding Document. Section 3: EQC: 2. Qualification and Sub Clause 2.3.2

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
392.	11-01-02	1	3	3 to 8	2.4.1.a & 2.4.1.b	We have noted that "each member" must meet this qualification criteria by having experience of atleast one inastallation of specified SWRO. Kindly note that this project will need combined expertise of a " Technology Campany" and "Construction Company". Although technology company meet this qualification, construction of water retaingng structures, which is very critical component in this project and hence their participation as JV patner is very important. In view of this, we request to revise this criteria for "each memebr" ad "not applicable". Please confirm	Refer Revised Bidding Document. Section 3: EQC: 2. Qualification and Sub Clause 2.4.1
393.	11-01-03	1	3	3 to 8	2.4.1.c	As explained earlier, kindly note that, " construction company" usually not involved in operation and maintanance of the desallination plants. However considering their strong local presence, they can arrange manpower,Chemiclas and consumables required for ruitng operation and maintanace activities. Technology company will definitely depute their well experianced manpower for monitoring of operation and maintanance. This will ensure the smooth functioning of the desal plant at optimaum performance level. In view of this ,we request to recise this criteria for "Each member " as "Not applicable " and " All partners combined" as "must meet requirement ". Please confirm	Refer Revised Bidding Document. Section 3: EQC: 2. Qualification and Sub Clause 2.4.1
394.	11-02-01	1	1		7.6	Please provide the minutes of pre-bid meeting for our reference.	Provided.
395.	11-02-01	1	1		20.1	We have noted bid validity period as 270 days. Considering fluctuation of international market prices and exchange rates, this is very long period for us to validate our prices for this longer period. As per international standards for such type of bids, we request to confirm the bid validity period as 150 days.	The Contract stands as it is.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
396.	11-02-03	1	1		22.1	We could not find the number of "Copy" of bid to be submitted in BOS. Please confirm the same.	Refer Revised Bidding Document. Section 2: BDS: ITB 22.1
397.	11-02-04	1	3		2.4.1.a	As per international standards and as demonstrated in recent ongoing tenders in India and UAE (For plants much large capacity than subject tender), technical qualification requirement of bidder is maximum 2 plants of 50-80% of capacity (i.e. 12-19.2 MLO for the subject tender). Considering this, we request to revise the qualification as "participation in two (2) contracts that are similar to the design and build portions of proposed works" &"3) with potable water production capacity of 12 MLO or more using SWRO desalination process" &"4) where the value of the bidder's participation in design and build portion of each contract exceeds USO 20 Million". Please confirm.	Refer Revised Bidding Document. Section 3: EQC: 2. Qualification and Sub Clause 2.4.1

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
398.	11-02-05	1	3		2.4.1.b	As you are aware that for the execution of SWRO based desalination plant contractor has to assemble various components sourced from different countries (such as membranes, pressure vessels, high pressure pumps, energy recovery devices, DAF system, Electrical components, Automation components et c.). Hence, the bidder who has experience of execution of SWRO based desalination plant either at home country or any other country can execute the project irrespective of location of the plant. Further, construction (Civil / Fabrication) related activities to be undertaken by a construction company, which is mobilised in country or in the neighbouring countries where the desalination plant is to be executed. Considering this, qualification of bidder "Outside their home country" is not so important, rather experience of construction partner of bidder in Sri Lanka/ neighbouring countries is very important. In view of this, we suggest revising this clause as "Experience of civil works in Sri Lanka/ India within last 10 years". Please confirm.	Refer Revised Bidding Document. Section 3: EQC: 2. Qualification and Sub Clause 2.4.1
399.	11-02-06	1	3		2.4.1.c	As explained earlier, kindly note that "Construction Company" usually not involved in operation and maintenance of the desalination plants. However considering their strong local presence, they can arrange manpower, chemicals and consumables required for routine Operation and Maintenance activities. Technology company will definitely depute their well experienced manpower for monitoring of Operation and Maintenance. This will ensure the smooth functioning of the desal plant at optimum performance level. In view of this, we request to revise this criteria for "Each member" as "Not applicable" and "All partners combined" as "must meet requirement". Please confirm.	Refer Revised Bidding Document. Section 3: EQC: 2. Qualification and Sub Clause 2.4.1

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
400.	11-02-07	1	3		2.5.2	Request you to exclude this clause considering	Refer Revised Bidding Document. Section 3: EQC: 2. Qualification and Sub Clause 2.5
401.	11-02-08	1	4		Bid Security/ paragraph 5	We have noted that requisite bank guarantee is "Open" type bank guarantee without any clear expiry date. We propose to add words "or (c) in either case, 28 days after bid validity period". Please confirm .	Refer Revised Bidding Document. Section 2: BDS: ITB 21.1
402.	11-02-09	2	6		2.1.1 / Paragraph	We have noted that successful bidder has to collect the sea water sample daily till completion of design phase. Although we shall follow the same, however in case if some parameter (e.g. Suspended solids, Turbidity, Oil & Grease, Micro -biological impurity et c.) is beyond design limits of selected pre-treatment, Client should allow us to review and revise the pre-treatment equipments. As the project is based on "Fixed price" basis on scope of supply as per tender document, this revision should be considered as change order and prices of the same should be additional cost of equipment plus 15% overhead and margin for contractor. Please confirm.	Additional information obtained may lead to a change in the design to ensure the satisfactory performance of the plant.
403.	11-02-10	2	6		Table 2-1	We have noted design concentration for "Bromide" as 73 mg/l. This seems to be very high based on our experience. Please check and confirm.	This is a very typical value for seawater and the value is supported by the literature.
404.	11-02-11	2	6		Table 2-1	Value of Silica is missing in the table. As you are aware that this is very critical parameter to analyse scaling potential of SWRO membranes, we request to provide the same	Silica in seawater can typically be 1 to 5 ppm. Additional monitoring will be required to determine the concentration of silica off the coast at the treatment plant site. Further testing will be undertaken to determine the concentration of silica.
405.	11-02-12	2	6		Table 2-2	Considering average values of Turbidity as 1.0 NTU and TSS as 8.0 ppm, value of SDI can't be 14.7. We request to recheck the same and confirm.	Refer Revised Bidding Document; Section 6: ERQ: Table 2-2

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
406.	11-02-13	2	6		Table 2-1 & 2-2	We understand that pre-treatment and SWRO modules to be designed based on parameters mentioned under "Average" value column as per table 2-2. The value of individual ions as mentioned in Table 2-1 should be extrapolated to meet the value of TDS as 32,500 ppm. Please confirm.	Refer Revised Bidding Document. Section 6: ER: Chapter 6, Clause 6.1.1 Chapter 2, Table 2-3 .The "Maximum" value in Table 2-2 shall be considered for design
407.	11-02-14	2	6		Table 2-4	We have noted various parameter for product water quality. However we could not find the values of certain parameters (as viz. Albuminoid Ammonia, Total Iron, Manganese, cryptosporidium) are not provided for raw sea water. Please provide the value of the same in order to confirm product water quality.	Table 2 -4 is the standard for Potable Water.
408.	11-02-15	2	6		Table 2-5	We understand that TDS of concentrate should be "not more than 1% higher than ambient salinity at 2 meter depth from the shore" . Considering minimum 45% recovery from SWRO system and raw sea water salinity of 32,500 ppm, concentrate salinity shall be atleast 59,000 ppm. This is about 81% higher than "ambient salinity (32,500 ppm)". In order to meet the discharge conditions, we have to dilute the final disposal with very large quantity of raw sea water. Facility for the same shall consist of coffer dam type structure near to seashore and pumping facility of raw sea water into this dam with circulation facility. However this facility is not envisaged in tender specifications. We request to review the same and advise about inclusion of the same in order to meet the discharge quality.	Modelling undertaken by the Employer has shown that if the discharge point is located as specified and the diffuser is well designed close to ambient conditions should be reached within 22 m of the outlet. Refer Revised Bidding Document. Section 6: ERQ: Attachment 2 – A.2.4 Concentrate Dispersion Modelling Report
409.	11-02-16	2	6		3.2.e	We request to advise about existing above/ underground structures, piping and other facilities present at site in order to estimate for removal of the same.	The SWRO Plant site has no existing surface or subsurface facilities, structures, buildings and piping which will need to be removed or relocated.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
410.	11-02-17	2	6		3.2.2.d	We request to advise about underground pipelines/ cables passing through the SWRO desalination plant site in order to estimate for re-routing of the same.	The SWRO Plant site has no existing surface or subsurface facilities, structures, buildings and piping which will need to be removed or relocated.
411.	11-02-18	2	6		3.2.2.ii	Please note that average useful life of filter cartridges are about 3-4 months depending upon suspended solids load. Considering UF membrane in pre-treatment maximum possible life can be about 6 months. Hence, we request to revise the "Useful life warranty" for filter cartridges as 6 months. Please confirm.	Refer Revised Bidding Document. Section 6: ERQ: Chapter 15 – Table 15.1
412.	11-02-19	2	6		6.1.2	We request to provide flux design guidelines for UF membranes for "n" and "n-1" conditions.	The Contractor is responsible for the design of the pre-treatment system and shall design the membrane pre-treatment system using a flux for all units on line and a flux for one unit off line for cleaning or backwash that will allow the plant to meet the performance specifications listed in Section 6:ERQ: Table 2-3.
413.	11-02-20	2	6		7.2.2	As you are aware that incorporation of pressure exchanger will lead to volumetric mixing of concentrate to feed. As different bidder may consider different volumetric mixing ratio, in order to have uniformity in design, we request to confirm the design volumetric mixing ratio.	Design is responsibility of the Contractor.
414.	11-02-21	2	6		8.3	We have noted that "Calcium Hypochlorite" based disinfection system is envisaged. Based on local market information, Calcium Hypochlorite is not readily available in Sri Lanka. Request to accept Sodium Hypochlorite based disinfection system. Please confirm.	Sodium hypochlorite is to be used for disinfection and the control of biological growth throughout the plant. Chlorine gas is to be used for disinfecting the product water. Refer Revised Bidding Document; Section 6 - ERQ – Chapter 8.3
415.	11-02-22	2	6		11.1.2	We have noted the requirement of various rooms for admin building. Please provide the list of furniture required for various rooms for estimation purpose.	The Contractor shall provide required furniture according to the type of room.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
416.	11-02-23	2	6		11.1.2	We have noted the laboratory shall be adequately furnished and equipped with required instruments/ apparatus and glasswares . To bring all the bidders at par, we request to provide list of these instruments/ apparatus / glasswares.	Refer Revised Bidding Document; Section 6: ERQ: Chapter 16 – Sub Clause 16.14.2.
417.	11-02-24	3	8		6.5	We have noted working hours as 08:00 hours to 17:00 hours. However please note that inorder to complete the construction activities, it may be necessary to extend the working hours sometime. It may also be required to complete the works in desired completion period. In this situation, we understand that Client will allow Contractor for extra working hours. Please confirm.	Agreed.

**GOVERNMENT OF THE DEMOCRATIC SOCIALIST REPUBLIC
OF SRI LANKA**

MINISTRY OF CITY PLANNING & WATER SUPPLY

NATIONAL WATER SUPPLY AND DRAINAGE BOARD

**JAFFNA KILINCHCHI WATER SUPPLY AND SANITATION PROJECT
– ADDITIONAL FINANCING**

LOAN NO: 37378-SRI

**Design, Build and Operate (DBO) of a 24 MLD
Sea Water Reverse Osmosis (SWRO)
Desalination Plant at Thalaiyadi, Jaffna
District, Sri Lanka**

**CONTRACT NO.: PEIC/JKWSSP/SEA WATER REVERSE
OSMOSIS PLANT/2015/01**

Answer for Queries – Set 2

**Project Director's Office
Jaffna-Kilinochchi Water Supply and Sanitation Project
National Water Supply and Drainage Board
KKS Road
Jaffna
Sri Lanka
June 2017**

Design, Build and Operate a Sea Water Reverse Osmosis Desalination of 24 MLD Capacity at Thalayadi, Jaffna District

The answers to the quires (Set 2) are listed below. The answers are to be read in conjunction with **revised bidding document**.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
1.	01-01-01		Section 6 – Employer Requirements	102	14.1 (n)	<p><i>“Two 100%-load 33 kV electrical conduits shall be provided for the SWRO desalination plant (one conduit for CEB supply and other one for Standby Generator) electrical system with the 1.1 kV electrical switchgear of the SWRO Desalination plant and facilities for interconnecting to the SWRO Desalination Plant electrical system ”</i></p> <p>Please clarify if there is a typo error on the voltage level at 1.1kV. From the Distribution Code of Sri Lanka, voltage ratio from Grid should be 33kV/11kV.</p>	It shall read as 33kV / 11 kV
2.	01-01-02		Answers for Queries No. 185	61		<p><i>“ The electricity supply will be as follows: A) one 33 kV high voltage line coming from the CEB grid to a 33kV/1.1 kV substation at the plant site B) one high voltage 33kV to 1.1 kV step down substation located at the plant site ”</i></p> <p>A) Please clarify if there is a typo error on the voltage level at <u>1.1kV</u>. From the Distribution Code of Sri Lanka, voltage ratio from Grid should be 33kV/11kV. B) Please clarify if there is a typo error 33kV/<u>1.1kV</u> step down <u>substation</u> or 33kV/11kV step down <u>transformer</u>.</p>	It shall read as 33kV / 11 kV

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
3.	01-01-03		Section 6- Employer Requirements	32	Table 2-4 Key Potable Water (Product Water) Quality Requirements Chapter 7.1 (b)	<p>Potable Water Quality Requirement Total Dissolved Solids (TDS) -200 mg/l</p> <p>Based on total dissolved solids of 200 mg/l stated in Table 2-4, a two (2) pass reverse osmosis (RO) system (SWRO and BWRO system) is required to meet the potable water quality. However in Section 6 Chapter 7, it is stated that the RO membrane system "shall be a single SWRO pass Works" and that only space need to be provided for the future installation of the second pass.</p> <p>Please confirm that the bidder only need to provide a single SWRO pass for the plant and the potable water total dissolved solids requirement shall be 500 mg/l as stated in Table 2-4 (Key Potable Water Quality Requirement (NWSDB Standard/ SLS Standard 614-2013) of the superseded tender documents.</p>	Tale 2 – 4: Key Potable Water (Product Water) Quality Requirements: The revised value of TDS is 500 mg/l.
4.	01-02-01		Section 6 - Employer Requirements	11	1.2.1	<p>"The Contractor shall ensure that the potable water storage tank working capacity of 10 ML (10,000 m³) is considered in the sizing and design of the RO training cleaning system i.e. there should no net reduction in the SWRO Desalination Plant's capability to export a net 24 MLD capacity, even when one RO train is being cleaned."</p> <p>The 10 ML potable water storage tank has sufficient capacity to act as a buffer such that even with a loss of production during CIP, the net export capacity of 24 MLD is maintained.</p> <p>Kindly confirm acceptance that the bidder is allowed to design the RO system to overproduce after CIP to top up the water level in the potable water storage tank.</p>	The Contract stands as it is.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
5.	01-02-02		Attachment A.2.4 Pipe Profile			Kindly confirm the intake well depth, wet well depth, outfall pipe size and diffuser size drawn is for bidder's information only. The bidder is allowed to propose wet well depth, intake well depth, outfall pipe size, and diffuser size based on bidder operational experience.	Design is responsible of the Contractor. The diagram is for guidance and illustrative purpose only.
6.	01-02-03		6	6-24	1.6.1 (m)	<p>Please be advised that commencement date of the DBO Contract is 42days after the acceptance of LOA and there will have 910days for D&B period.</p> <p>a) Please clarify the meaning of key Operation Service Leadership Team</p> <p>b) Please confirm Contractor shall include the cost to make available key Operation Service Leadership Team for 910days prior to the start of Operation Services Period in the price.</p>	<p>Commencement Date is commencement of Contract and Commissioning is commencement of O&M after successful Acceptance Test.</p> <p>The Employer would like intermittent access to the person in OS during the D-B period, and would expect this person to be present during the commissioning. Including the cost of this in its bid price is a decision for the bidder. But does not change the Employer's Requirements. Having said this apart from commissioning it is not expected that such a person would have a large input.</p>
7.	01-02-04		6	6-113	16.10.1 (a)	<p>Kindly confirm that only monthly average Potable water quantity delivered to connection point, which is at the inlet of Potable Water Tank, shall be monitored instead of each of the points of delivery.</p> <p>As referred to Serial no. 240 of Answer to Queries_SWRO Plant_JKWSSP_12-05-2017, the points of delivery is referring to the location mark as "C" at the A9 road B402 road junction in Attachment A.2.5.b. This delivery point is excluded in the DBO Contract and hence the Contractor shall not hold responsibility to monitor the Potable water quantity delivered to this location during the 7 years of Operation Service.</p>	Monitoring of the quantity shall at inlet of the potable water tank.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
8.	01-02-05		6	6-122	16.14.2 (b) 16.14.2 (d)	Kindly confirm that the Delivery Points shall mean the inlet of Potable Water Tank. Reference: (b) Potable water Quality at the points of delivery of the potable water (d) Daily and Total Potable Water flows for the current Month measured at the Delivery Points (million cubic meters/month)	Monitoring of Quantity and Quality of Potable Water shall be at inlet of the potables water tank.
9.	01-02-06		6	6-138	16.16.3.2	Kindly confirm that the "key personnel" mentioned shall refer to selected people for Key Positions mentioned in Table 16-6 Treatment Plant Positions	Yes. Confirmed.
10.	01-02-07		6	6-138	16.16.3.3	Kindly confirm that all cost of attending specialised courses, visits or working in other desalination plants mentioned shall be borne by the Employer and the Contractor shall only provide reasonable assistance to the Employer upon request.	Yes. Confirmed.
11.	01-02-08		6	6-138	16.16.3.4		
12.	01-02-09		9	9-13	Appendix 2, 2)	2) For Price Schedule 5.2 - Operation Service – Contractor's Variable Rate Please confirm that MPI0 and MPI1 is referring to material and equipment price index.	MPI ₀ : Consumer price indexes applicable in the country of origin on the base date MPI ₁ : Consumer price indexes applicable in the country of origin on the date for adjustment
13.	01-02-10		9	9-13	Appendix 2, 4)	4) For Price Schedule 6 – Asset Replacement Fund Please confirm that MPI0 and MPI1 is referring to consumer price index.	MPI ₀ : Material and equipment price indexes applicable in the country of origin on the base date MPI ₁ : Material and equipment price indexes applicable in the country of origin on the date for adjustment

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
14.	01-02-11		9	9-13	Appendix 2, 4) A.	4) For Price Schedule 6 – Asset Replacement Fund Please confirm that AR0 and AR1 in the formula is referring to CVR0 and CVR1.	AR ₁ = Inflation adjusted amount payable to the Contractor AR ₀ = Asset Replacement bid price (base price) in local currency specified in the Price Form 6
15.	01-02-12		9	9-14	Appendix 2, Conditions Applicable to Price Adjustment (a)	Kindly clarify what the mentioned Interim Certificate is referring to.	Interim Certificate means Interim Payment Certificate
16.	02-01-01	Bidding forms	Section 4	4-58	8.C.4	What are the installation costs referred to In the Contractor's Variable Rate with respect to degradation of membrane? What are the installation costs referred to In the Contractor's Variable Rate with respect to the asset life of components? This sentence is not clear and we would appreciate if it could be further developed.	Refer Revised Bidding Document 8.C.1 and the clause 8.C.4 shall be deleted.
17.	02-01-02	Employer's requirements	Section 6	6.110	16.3	Please confirm the frequency of the analysis to be carried out?	Refer Revised Bidding Document; Section 6 - ERQ: Chapter 6: Table 16 -3, 16 – 4 and 16 -5.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
18.	02-01-03	Employer's requirements	Section 6	6.110	16.3	Does a Monitoring Program have to be included in the O&M proposal?	Yes. Please refer to Section: Attachment – A.2.8.c: EIA - Environmental Considerations-Monitoring Programs. The bidder is to include the costs of these monitoring programs in its bid price.
19.	02-01-04	Employer's requirements	Section 6	6.112	16.9	Please indicate the final destination of the solid waste and hazardous waste as discharge Is part of bidder' scope?	The Employer shall guide to a place for solid waste disposal. The Bidder shall assume that the disposal place would be within 50km from SWRO plant. The Hazardous Waste / Discarded RO filters should be returned to supplier as per CEA requirements.
20.	02-01-05	Employer's requirements	Section 6	6.112	16.9	Please indicate the discharge point of the waste water?	Refer Revised Bidding Document: Section 6: ERQ: Attachment 2: A.2.8.C: Table 9.1 Environmental Consideration. The waste streams shall be handled as mentioned in above document.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
21.	02-01-06	Employer's requirements	Section 6	6.112	16.9	Please indicate the discharge point of the sanitary water?	<p>Refer Revised Bidding Document: Section 6: ERQ: Attachment 2: A.2.8.C: Table 9.1 Environmental Consideration. The waste streams shall be handled as mentioned in above document.</p> <p>The discharge from the onsite human waste treatment facility may be directed into the outfall pipe proving the onsite treatment facility is well maintained. This facility shall comply with CEA regulations.</p>
22.	02-01-07	Particular conditions of contract	Section 8	8.18	14.1	Who pays the VAT in the schedules 2, 3, 4 and 5: The employer or the Contractor?	<p>Price Schedules 1: The Contractor shall initially pay custom duties and taxes for speedy clearance from the port of importation. The Employer shall reimburse the customs duties which includes VAT levied by the Sri Lanka Customs on importing Items in Price Schedule 1 on submission of original customs clearance documents/receipts.</p> <p>Price Schedules 2, 3, 4 and 5: The Contractor shall add VAT to his applications for payment and the Employer would pay the VAT to Contractor. Then the Contractor shall pay VAT to government in accordance with normal Sri Lankan tax practice.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
23.	02-01-08	Contract forms	Section 9	9.21	4 "Penalty for failure to undertake water quality testing in accordance with the frequency specified in Employer's Requirements".	Please specify the required frequency?	Refer Revised Bidding Document; Section 6 - ERQ: Chapter 6: Table 16 -3, 16 – 4 and 16 -5.
24.	02-01-09	Vol.1_ Revised bidding document	Section-2	2-2	ITB 11.2(k), pt. 7	For large companies with operations and contracts across the world, it is practically impossible to validate the information for all bonds, penalties, claims etc. for such a long period, that is, since 2004. We therefore, request you to limit the scope of information for the period since 2014. This is in line with pending litigation request as requested in the bid. Please confirm your acceptance.	The date "January 1, 2004" shall be replaced as "January 1, 2012". Recommend to replace the wordings " All Key DBO Team Members shall individually disclose the following information related to their past performance and legal standing" with "All Key DBO Team Members shall individually disclose the following information (if there any) related to their past performance and legal standing". Also recommend to delete the wordings "Please note that occurrence of any of the events described above and/or failure to disclose such events may result in the disqualification of the Bidder."

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
25.	02-01-10	Vol.1_ Revised bidding document	Section-4	4-41	Attachment 2 to Form EXP – 1(c), Affiliate Company Guarantee	We understand that only bidders who seek to use references for DB or O&M from their Affiliate company s are required to furnish Affiliate Company Guarantee. Thus, if a bidder has all requisite references for DB and O&M of its own, without using any references from an affiliate company, then such bidder is not required to furnish an Affiliate Company Guarantee. Please confirm.	<p>The Bidders who seek to use references for Annual Turn Over and O & M from their Affiliate companies are required to furnish Affiliate Company Guarantee.</p> <p>If a bidder has all requested references for Annual Turn Over and O & M of its own, without using any references from an affiliate company, then such bidder is not required to furnish an Affiliate Company Guarantee.</p> <p>The Bidder should had the reference for Design and Build his own.</p>
26.	02-01-11	Vol.1_ Revised bidding document	Section-8	8-3	10.6 (b) Maximum compensation payable by contractor.	We request, maximum compensation payable by employer for Operations services should be “10 % of the accepted contract amount for operation service”. Please confirm.	The Contract stands as it is.
27.	02-01-12	Vol.1_ Revised bidding document	Section-8	8-11	4.14 Avoidance of Interference	We request that consequential damages should be excluded from contractors’ liability, since such occurrences are out of contractor’s or sub-contractor’s control. Thus, the 3 rd paragraph of CI 4.14 should be read as “The Contractor will be held liable for all damage to the road, irrigation structures, ditches, water mains, and electric or telecommunication cables, lines or ducts of any kind caused by him or his Subcontractors in the execution of the Works”. Please confirm.	The Contract stands as it is.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
28.	02-01-13	Bidding Documents,	Section 6	6-74	Equipment Specification Data Sheet	For all the pumps, it is requested to provide information of the level of detail presented in table of Section 4 - 2.1.3. Please provide the table.	The Table is deleted. The Bidder shall provide the details of Manufacturer, Pump Type, Number of Units, Operation. Logic, Speed Control Type, Pump Capacity, each (m3/hr), Discharge Pressure (bars), Break Horsepower, hp, Pump Speed at Maximum Flow (rpm), Pump Efficiency at Average Flow (%), Pump Efficiency at Maximum Flow (%); Pump Material of Discharge Head, Impeller and Shaft shall be Super Duplex Stainless Steel; The Electrical Motors type shall be Corrosion Resistant & Weather Proof, Manufacturer, Electrical Characteristics, Horsepower, hp, Enclosure
29.	02-01-14	Bidding documents	Section 6	6-57	Chemical process piping	The bidding document request piping between the tank connection and valve shall be metallic. Normally for the type of chemicals used in a desalination plant (except for H2SO4 due to high concentration), plastic materials are perfectly suitable. Please, confirm if plastic material, if applicable and suitable with the chemical characteristics, , can be used	The Contractor is responsible for selecting pipe materials from tank to chemical dosing pump based on considerations for chemical/material compatibility, double containment as specified in the bidding document.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
30.	02-01-15	Bidding Documents	General comment	NA	Discrepancies between revised Tender documents and annexe A.2.8 – Environmental Study Report	There are some discrepancies between both documents (as example seawater quality where in the Revised tender documents the minimum T ^a have been corrected at 24 °C and in the annexe A.2.8 reflects 27.2 °C. In case of discrepancies please confirm that the information that appear in the Revised Tender Document should prevail over the EMP?	The Minimum Temperature shall be 24 °C.
31.	02-01-16	Bidding Documents	Section 6	6-89	Dissipation distance from the outfall discharge	In page 6-89, the distance between the discharge point of the diffuser is defined as 100 m. However, in page 6-14 of the same document, the distance for the diffusion is fixed at 50 m. Please confirm the value we have to consider for the outfall design	The brine outfall arrangement and diffuser system shall be designed, constructed and operated to allow the discharge salinity to be dissipated rapidly and to reach ambient seawater levels in less than 50 meters from the point of discharge.
32.	02-01-17	Bidding Documents	General comment	NA	HVAC requirements	According to revised Tender documents, the HVAC is required in all the building. However, following answer 122 (query N° 02-04-08), of the previous set of clarifications, the reply given was “Agreed. Design is Contractors responsibility” to the question “Generally HVAC is not needed in the SWRO building”. Please confirm that the reply given in the previous set of clarification is the correct one	The Contractor is not required to install HVAC in the SWRO building. The clarification is the correct one.
33.	02-01-18	Bidding documents	5.3	6-69	Intake screens	As the Revised Tender documents allow different type of seawater intake pumps, the screening configuration must be defined depending on the type of pumps. It is requested to leave the screening design and configuration to the responsibility of the Contractor.	The Contractor is responsible for the selection of the seawater intake pumps and the selection, design and configuration of the intake screens.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
34.	02-01-19	Bidding Documents	2.2	6-30	Table 2.3. SDI quality requirements	<p>As per our O&M experience in several SWRO plants around the world, the tender specified minimum pre-treatment filtrate water quality requirements in terms of SDI cannot be reached with sand filtration: It should be :</p> <p>SDI₁₅ < 4 (90 %) and < 5 (100%),</p> <p>Those values are compliant with RO membrane suppliers' warranties.</p> <p>Please confirm your acceptance.</p>	<p>The contractor is responsible for selection, design and configuration of the reverse osmosis pre-treatment system. The Contractor is responsible for ensuring the silt density index of the pre-treatment filtrate complies with the membrane suppliers' warranties.</p> <p>Table 2.3. SDI:</p> <p>SDI₁₅ < 4 (90 %) and < 5 (100%)</p>
35.	02-01-20	Bidding Documents	12.2	6-96	Service Air	<p>According with revised tender documents, a service air compressor and receiver shall be installed in the RO building.</p> <p>We kindly request to have the freedom regarding the location of the service air compressor always that we ensure a proper design of the service air network.</p> <p>Same comment apply to location of the instrument air compressors</p>	<p>The Contractor is responsible for the design, procurement and installation (including selecting the location) of the service air compressor. The Contractor may located the service air compressor at its preferred location. The same applies to any instrument air compressors.</p>
36.	02-01-21	Bidding Documents	Section 6	6 -32	Table 2.4	<p>The TDS is reflected as 200mg/l whereas in previous non revised version was reflected as 500mg/l. Please confirm that the correct value is 500mg/l</p>	<p>Tale 2 – 4: Key Potable Water (Product Water) Quality Requirements: The revised value of TDS is 500 mg/l.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
37.	02-01-22	Vol.1_ Revised bidding document	Section 9 contract form	9-11	Schedule No. 5 – Operation Services- Procedures for Calculation of the Operation Service payments	<p>We understand, under the 3rd point of this clause, Schedule 5.3; The Employer will reimburse the Contractor's Electricity Payment for all sub schedules of Schedule 5.3 (section-4), i.e.,</p> <ul style="list-style-type: none"> • Schedule 5.3.1 (for SWRO Plant) • Schedule 5.3.2 (for Administration Building, Quarters, Circuit Bungalow and internal lighting) • Schedule 5.3.3 (for Potable Water High Lift Pumps) <p>Please confirm.</p>	Yes. The Employer will reimburse the Contractor's Electricity Payment up to the performance guarantee limit.
38.	02-01-23	Vol.1_ Revised bidding document	Section 9, Contract forms	9-23	Appendix 7, Cl. 4 Failure in Guarantees and Performance Damages - Rules for the evaluation and imposition of damages.	<p>We understand, 24 hour period mentioned as 00.00 am to 12.59 pm shall be read as 00.00 am to 11.59 pm. Please confirm.</p>	24 - hour period is 00.00 am to 11.59 pm.
39.	02-01-24	Vol.1_ Revised bidding document	Section 6- Employers Requirements	6-23	1.3.10 Electrical Supply System j) & k).	<p>We understand the cost of diesel for DG set operation (During DB and O&M) shall be reimbursed by Employer with escalated rate. Please confirm.</p> <p>Further we request to provide maximum quantity for Diesel consumption max. liters per month during O&M of plant.</p>	For the consumption of Diesel during CEB power interruption, actual cost of Diesel shall be paid by Employer. Price for above mention work not need to include to Bidder's Price proposal.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
40.	02-01-25	Vol.1_ Revised bidding document	Section 6- Employers Requirements	6-30	2.2 Pre-treatment Water Quality	<p>In the soft copy of revised bid document (CD drive), there are two tables within Table 2-3 with different values for Turbidity and SDI₁₅. However, in Hard copy of Revised Bid Document, there is only one Table 2-3. We understand, the values for Turbidity and SDI₁₅ given in hard copy should be referred for designing of plant (mentioned below):</p> <ul style="list-style-type: none"> • Turbidity (daily avg./max) (for GMF) 0.3 NTU/ 1 NTU • SDI₁₅ NTU (for Membrane filters) 0.2 NTU/ 0.5 <p>Please confirm.</p>	<p>The Hard Copy should be referred.</p> <p>The RO pre-treatment system provided and operated by the Contractor shall meet the following filtrate requirements for turbidity;</p> <p>Granular Media Filters must never exceed 1 NTU, and must not exceed 0.3 NTU in 90% of daily samples in any month</p> <p>Membrane Filters must never exceed 0.5 NTU, and must not exceed 0.2 NTU in 90% of daily samples in any month.</p> <p>SDI₁₅ < 4 (90 %) and < 5 (100%)</p> <p>The Contractor is responsible for ensuring the silt density index SDI₁₅ of the pre-treatment filtrate complies with the membrane suppliers' warranties.</p>
41.	02-01-26	Vol.1_ Revised bidding document	Section 6, Employers Requirements	6-95	11.4 Vehicles for Employer's Representative during Operation Service	<p>We understand, the maximum total overall running km/month for all vehicles mentioned in referred clause shall be 4000 km/month & operational timing during operation service shall be 7 am to 6 pm as indicated in page no. 48 clause no. 3.5.2. Transport facilities for design build. Please confirm.</p>	<p>The Vehicles listed under Section 6 – 3.5.2 are for Design and Build Period. The Bidder shall include the rates for this item in his price proposal.</p> <p>The Vehicles listed under Section 6 – 11.4 are to purchased and handed over to Employer. The cost for this item is included under the Provisional Sum. The Bidder shall not include the rates for this item in his price proposal.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
42.	02-01-27	Vol.1_ Revised bidding document	Section 6- Employers Requirements	6-109	16.2 Staffing, Table 16-1: Possible Requirements for Staffing over the 7-year Operation Period	The list of staffing does not include any security personnel for SWRO plant. We understand, the security personnel for SWRO plant shall be provided by employer. Please confirm.	<p>The security personnel for SWRO plant shall be provided by the Contractor. Further Refer to the "Note" given below the Table 16-1.</p> <p>The Contractor is to provide its own staff in the number and with the skills it deems necessary to meet the performance requirements of the plant. The Contractor is also required to secure the plant and have in place procedures to limit access to the plant to authorised personnel only. This point has been covered in the answers to the previous questions and in the EIA-Environmental Considerations-Safety. The plant is to be secured 24/7, during both the D-B and OS periods, and the Contractor will be held accountable for this.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
43.	03-01-01	6	6	15	<p>The design, supply and laying of potable water conveyance</p> <ul style="list-style-type: none"> ○ Length: approximately 8 km ○ Diameter of the Pipe: 800 mm ○ Pipe Material: DI ○ Lagoon Crossings: with pipe supports ○ Connection to the existing line at water delivery point by trenchless method (across A9 road) 	<p>Please confirm if Lagoon crossing with pipe supports is the only method allowed. Or pipe installed above water with concrete support could also be applied.</p>	<p>The method used to support the pipes as they cross the lagoon is to be selected by the Contractor. However please note that the method must minimise the impact of any supporting structure on the lagoon, and will be subject to environmental scrutiny. Support methods that have a significant impact will be rejected. Refer Section 6: ERQ: Attachment 2: A.2.8.C: Table 9.1 Environmental Consideration for further information.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
44.	03-01-02	6	6		The contractor will provide three references where the proposed pre-treatment system has been used on desalination plants constructed by the contractor with capacity greater than 10,000 m ³ /day in the last five years.	Please consider that pre-treatment is not always the same in all the plants. Could you please re consider the time frame?	The wordings shall be replaced with; "The contractor shall provide one reference where the proposed pre-treatment system has been used on desalination plants to produce potable water, constructed by the contractor with capacity greater than 10,000 m ³ /day in the last ten years".
45.	03-01-03	6	6		Grade of concrete 40 is advised, please consider the use of Grade 35 A which is easier to formulate in Jaffna.	To cure the high temperatures reached by concrete 40 would be complicated and as a result some bad results can be expected. The cure of Grade 35 is easier and the one preferred by construction companies both in Sri Lanka as per experience in most of the world	Agree to Grade 35 A concrete.
46.	04-01-01	Part I	Section 4- Bidding Form	Page 4-7	Item 43 of Form AT1-LTB	As per Chapter 8.3 of Section 6 Employer's requirement, a chlorine gas disinfection system for SWRO desalination plant shall be constructed. As such, we understand that item 43 of Form AT1-LTB will be revised to "Is disinfection system for feed of chlorine gas used for disinfection of the desalinated water?" Please kindly confirm.	Yes. The Item 43 of Form AT1-LTB shall replace with "Is disinfection system for feed of chlorine gas used for disinfection of the desalinated water?"

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
47.	04-01-02	Part I	Section 4- Bidding Form	Page 4-67	Subtotal of Schedule 4.3: Provisional Sums	<p>Sub-total of Schedule 4.3-provisional sum for local currency of LKR should be 436,000,000 LKR instead of the printed value of 434,000,000 LKR. We understand that there is a typo error on the sub total of the Schedule 4.3 Provisional Sum</p> <p>Please kindly reissue Schedule 4.3 with the correct value as stated above.</p>	The Total Amount of Provisional Sum for Local Currency is 436,000,000 LKR. There is no need to reissue the schedule as the answer to the question takes precedent over the bidding document.
48.	04-01-03	Part II	Section 6 - Employer's requirement	Page 6-16	Item (g), (k) Chapter 1.3.2	<p>With reference to Chapter 1.3.2 in Section 6, can we understand that if the bidder choose to offer Gravity Granular Media Filter (concrete type) as pre-treatment process; civil work include M&E works for Gravity Granular Media Filter shall be sized for production capacity of 24 MLD, which are not required to be housed in a building.</p> <p>Please kindly confirm if our understanding is correct.</p>	Yes. Confirmed.
49.	04-01-04	Part II	Section 6 - Employer's requirement	Page 6-17	Item (o), (p) Chapter 1.3.3	<p>As per item (o) and (p), Chapter 1.3.3 of Section 6 Employer's requirement, we understand that the building housing the RO system shall be constructed to cater for 48 MLD production capacity (i.e building build for 48 MLD with SWRO faciilites install for 24 MLD) including area within the building allocated for second stage RO system.</p> <p>Please kindly confirm if our understanding is correct.</p>	This is correct. It is important that all Bidders understand this point. The Employer anticipates a time when it will want to double the capacity of the plant and in addition reduce the amount of Boron in the product water.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
50.	04-01-05	Part II	Section 6 - Employer's requirement	Page 6-30	Table 2-3 Chapter 2.2	<p>We understand that minimum pre-treatment filtrate water quality requirement prior to RO shall be as per line 1 to line 8 of table 2-3, Chapter 2.2, as follow;</p> <ul style="list-style-type: none"> - Turbidity (daily avg./max): Granular Media Filters May never exceed 1 NTU, and must not exceed 0.3 NTU in 90% of daily samples in any month; Membrane Filters May never exceed 0.5 NTU, and must not exceed 0.2 NTU in 90% of daily samples in any month; - Site density index (SDI₁₅): < 3 (90% of time) never exceed 4; - Total Organic Carbon < 1.0 mg/L; - pH(min)/(max): 4/9 pH Units; - Oxidation Reduction Potential (ORP): less than 250 mV; - Chlorine Residual <= 0.02mg/L - Total Hydrocarbons <=0.04 mg/L <p>In case of discrepancy in table 2-3, the above values from Line 1 to 8 shall prevail over Line 9 to line 16 in the same table.</p> <p>Please kindly confirm.</p>	<p>The RO pre-treatment system provided and operated by the Contractor shall meet the following filtrate requirements;</p> <ul style="list-style-type: none"> - Turbidity Granular Media Filters May never exceed 1 NTU, and must not exceed 0.3 NTU in 90% of daily samples in any month - Membrane Filters may never exceed 0.5 NTU, and must not exceed 0.2 NTU in 90% of daily samples in any month. - Silt Density Index SDI₁₅ < 4 (90 %) and < 5 (100%) - Total Organic Carbon < 1.0 mg/L; - pH(min)/(max): 4/9 pH Units; - Oxidation Reduction Potential (ORP): less than 250 mV; - Chlorine Residual <= 0.02mg/L - Total Hydrocarbons <=0.04 mg/L <p>The Contractor is responsible for ensuring the silt density index SDI₁₅ of the pre-treatment filtrate complies with the membrane suppliers' warranties</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
51.	04-01-06	Part II	Section 6 - Employer's requirement	Page 6-67	Chapter 5.2.1 of Section 6	<p>As per Chapter 5.2.1 of Section 6 Employer's requirements, the intake shall be made of concrete with cupro-nickel grilles to ensure low corrosivity and high durability.</p> <p>We suggest to propose FRP intake, which is appropriate for service conditions. i.e. anti- corrosivity and high durability.</p> <p>Please consider our suggestion.</p>	<p>Ultimately the contractor is responsible for the design, material selection, installation and maintenance of grilles on the intakes consistent with the asset life of the plant. Where alternative materials to cupro-nickel are proposed for the grilles the Contractor shall provide references, including installation date and contact details for installations using the alternative materials. However one of the matters to be considered is the potential future cleaning of the grilles, which is normally undertaken by scraping. As such the Employer has favoured the use of metal as a material which easily accommodates scraping. If FRP was proposed the evidence provided by the Bidder would need to address this issue in detail.</p>
52.	04-01-07	Part II	Section 6 - Employer's requirement	Page 6-55	Chapter 3.8.2.2 of Section 6	<p>As per Chapter 3.8.2.2 of Section 6 Employer's requirements, automatic flow and control valves shall be furnished with electric motors.</p> <p>We suggest to propose pneumatic actuator for low pressure automatic flow valve.</p> <p>Please kindly consider our suggestion.</p>	<p>This question has been previously answered in the affirmative – the alternative suggested is acceptable.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
53.	04-01-08	Part II Answer for Queries	Section 6 - Employer's requirement	Page 6-102 Page 16	Chapter 14.1 of Section 6 Item 41	<p>As per the electrical requirement in Chapter 14.1 of Section 6 Employer's requirement and item 41 of Answer for Queries, two 100%- load 33kV electrical conduits shall be provided for the SWRO desalination plant (one conduits for CEB supply and other one for Standby Generator); However, this is contradictory with the standby electrical supply (Standby generator) requirement set in Chapter 14.3 of Section 6. We understand that the design of incoming electrical system shall be as below:</p> <ul style="list-style-type: none"> - One 100% load 33kV high voltage line coming from CEB grid and one 33kV/ 1.1 kV step down substation located at the plant site will be able to support for the 48 MLD plant, which are provided by CEB and considered in Item 2 of Schedule 4.3 Provisional Sums of Section 4; - The standby generator (1 MW, 400 V, under Item 13 of Schedule 4.3 Provisional Sums of Section 4) for at least one train (6MLD), CIP units, PLC and SCADA system with the step-up substation (400V/33kV) shall be considered as the standby electrical supply. <p>Please kindly consider if our understanding is correct.</p>	<p>The Source of Electrical Supply shall as follows;</p> <ol style="list-style-type: none"> 1. CEB: There is only one electrical supply taken from the CEB and distributed throughout the plant. 2. Standby Generator: The CEB supply is to be supported by onsite generators. The bidder is to cost, include in its price and install one generator which permits the orderly shutdown of the plant and protects its assets in the event of a CEB power failure, and, in addition, maintains basic services such as site lighting, security systems, admin building operations and computer systems. 3. Bidder shall provide the Design of the Generator which has the capacity to run one train (6 MLD). The cost is allocated under provisional sum and Employer will decide on purchasing. Bidder should not include the cost for above mentioned generator within his price schedule.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
54.	04-01-09	Answer for Queries			Item 41	<p>As per Item 41 of Answer of Queries, the power supply within the plant to be provided by the contract and able to support a 24 MLD plant to provided by the Contractor and included in the bid price.</p> <p>As such, we understand that the following electrical equipment shall be sized for production capacity of 24 MLD. and bidder shall make provision within the treatment plant area for future expansion to 48 MLD.</p> <ul style="list-style-type: none"> - Step down transformer 33kV to 400V; - MV 1.1 kV Switchgear for HP Pump Motor; - LVGB Low Voltage General Distribution Board 400V; - MCCs for intake pumpings, pre-treatment, RO system (Low voltage part), chemicals, potable water pumping station. 	<p>The responsibility for bringing the electricity supply to the plant and for the transformer to reduce the voltage belongs to the CEB and not the Contractor. This has been costed as a provisional item for the purposes of costing the entire project, but is not part of the Contractor's bid or assessment.</p> <p>The Contractor will pick up the supply downstream of the transformer and provide to the various parts of the plant to meet the specific requirements of the plant items. Normally electricity supply safety systems must be put in place and all wiring must be to the standards listed. Metering and monitoring systems are also required as per the bidding document.</p>
55.	04-01-10	Part II	Section 6 - Employer's requirement	Page 6-53	Chapter 3.7.12	<p>As per the requirement in Chapter 3.7.12 of Employer's requirement, all anchor bolts, anchorage components and fasteners shall be constructed of duplex steel of PREn Number of 40 or higher. We understand that this requirement is only applicable for installation where the installed anchor bolts, anchorage components and fasteners are in contact with the atmosphere.</p> <p>Please kindly confirm if the bidder can propose anchor bolts, anchorage components and fasteners of SS316 material in line with international standard for such application or anchor bolts with anti corrosive protection sealed in concrete box after erection.</p>	<p>Experience suggests that corrosion is a major problem in a desalination plant that it is very difficult to protect metals throughout the plant, and that is better to provide materials that do not readily corrode in the first place. Therefore, the requirements set out in the bidding document stand.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
56.	04-01-11	Part III	Section 8 - Special Conditions of Contract	Page 8-5	Subclause 19.2 (c)	As per subclause 19.2 (c) of Section 8, the amount of professional liability insurance shall be 50% of the contract amount for design and build, which is unusually high and unheard of in other similar Contracts. In all our previous tender experience for international D&B project, we have never encounter such high amount required for professional liability insurance and in addition such high amount for professional liability insurance is not available in Sri Lanka insurance market. Typically, Professional liability insurance cover only the design amount in the contract. Please amend this sub-clause to be in line with standard industrial practice for amount (i.e. 10~15% of the contract amount for design and build) to be covered under professional liability insurance.	The Contract stands as it is.
57.	04-01-12	Part III	Section 8 - Special Conditions of Contract	Page 8-6	Subclause 19.2 (a) (i)	As per subclause 19.2 (a) (i), the permitted deductible limits is defined as not greater than 5%. Kindly clarify if this % is based on claim amount or D&B value of the Contract? In any case for insurance coverage under CAR/TPL, a specific figure should be provided for the deductible limits (i.e. 50,000 USD). The deductible limits is a Contractor's risk and it is upto the Contractor to determine what will be deemed reasonable for the deductible limit when procuring the required insurance coverage. Please amend this subclause to allow for a reasonable, specified deductible limit based on standard industrial practice.	The Contract stands as it is.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
58.	04-02-01	Part I	Section 4	Page 4-60	Item 11 of Schedule 1	<p>We understand that item 11 of Schedule 1 Mandatory Spare Parts refer to 1 year spares that shall be delivered during D&B period and stored in warehouse and such spares as listed in Schedule 1 shall be handed over to the Employer upon completion of Contract Completion Certificate (i.e. completion of 7 years operation service period). Any usage of such spares during operation service period by the Contractor shall be replenish by the Contractor at Contractor's cost.</p> <p>Please confirm if our understanding is correct.</p>	<p>Refer Revised Bidding Document: Section 6: ERQ: Chapter 1.7: Inventory Items and Mandatory Spares</p>
59.	04-02-02	Part I	Section 4	Page 4-57	Item 8B of Price Schedules	<p>We understand that Operation spares during 7-year operation service period that have less than five years asset life shall be included in Schedule 5.1 Contractor's Fixed Fee.</p> <p>Please confirm if such spares required during operation service period and having less than 5 year asset shall be imported in the name of Contractor and hence Contractor's cost for such spares shall need to include custom duties and included in Schedule 5.1 Contractor's Fixed Fee.</p> <p>Please confirm.</p>	<p>Refer Revised Bidding Document: Section 6: ERQ: Chapter 1.7: Inventory Items and Mandatory Spares</p> <p>And the Items have less than five years asset life shall be included in Price Schedule 1 under Item 11.</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
60.	04-02-03	Part II	Section 6	Page 6-54	Chapter 3.8.2.1	<p>As per requirement in Chapter 3.8.2.1 of Section 6 Employer's requirement, all process piping (excluding vertical train piping) shall be located in piping trenches. no horizontal piping runs will be allowed to be supported from the pressure vessels or support rack assembly.</p> <p>For horizontal pipe of RO system and in line with international practice for SWRO plant of such capacity, we understand that Bidder can propose horizontal pipe of RO system to be supported by piping support which is rooted from the ground and on the condition that piping routing for such shall not obstructs the maintenance pass way.</p> <p>Please confirm.</p>	The Contract stands as it is.
61.	04-02-04	Part II	Section 6	Page 6-109	Table 16-1	<p>Since the captioned Contract is a DBO contract with 7 years operation period, we understand that the bidder shall operate the plant with their own Senior Operator and Maintenance Manager for 7 years, rather than 6 years. As such, Senior Operator and Maintenance Manager from the bidders for the 7th year of operation shall be included in Bidder's operation price; Table 16-1 Possible Requirements for Staffing over the 7 year operation period shall be revised accordingly.</p> <p>Please kindly confirm.</p>	Yes. Confirmed. Refer "Note" to the Table 16 -1.

**GOVERNMENT OF THE DEMOCRATIC SOCIALIST REPUBLIC
OF SRI LANKA**

MINISTRY OF CITY PLANNING & WATER SUPPLY

NATIONAL WATER SUPPLY AND DRAINAGE BOARD

**JAFFNA KILINOCHCHI WATER SUPPLY AND SANITATION PROJECT
– ADDITIONAL FINANCING**

LOAN NO: 37378-SRI

**Design, Build and Operate (DBO) of a 24 MLD
Sea Water Reverse Osmosis (SWRO)
Desalination Plant at Thalaiyadi, Jaffna
District, Sri Lanka**

**CONTRACT NO.: PEIC/JKWSSP/SEA WATER REVERSE
OSMOSIS PLANT/2015/01**

**Answer for Queries – Set 3
(Addendum 3)**

**Project Director's Office
Jaffna-Kilinochchi Water Supply and Sanitation Project
National Water Supply and Drainage Board
KKS Road
Jaffna
Sri Lanka
July 2017**

Design, Build and Operate a Sea Water Reverse Osmosis Desalination of 24 MLD Capacity at Thalayadi, Jaffna District

The answers to the quires (Set 3) are listed below. The answers are to be read in conjunction with **revised bidding document**.

No	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
1.	01-01-01		Section 2 Bid Data Sheet	02-Mar	clause 11.2(k)-point 2 - Construction or design claims or litigation with alleged damages totaling more than one hundred thousand dollars (US\$100,000) against any of the key DBO Team Members on or after January 1, 2004.	In our understanding this clause applies to claims or litigation against only the key DBO Team Member in question. For avoidance of doubt, please clarify and update the said Clause to "Construction or design claims or litigation with alleged damages totaling more than one hundred thousand dollars (US\$100,000) against only any of the key DBO Team Members on or after January 1, 2004."	The Bidder may comprise a single entity or a joint venture comprising two or more entities. The condition applies to each individual entity, and not to the entities as a whole.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
2.	01-01-02	Answer to Queries _SWRO Plant_J KWSSP _12-05-2017			Question No. 18, 79, 116,	<p>As understood from various clarification responses, please confirm that the following understanding is correct:</p> <p>a.) Mandatory spares including O&M spares are to be priced in Schedule 1 & 2 for the first 4 years.</p> <p>b.) Mandatory spares including O&M spares for 5th, 6th, 7th and 8th year shall be priced in Schedule 6, Asset Replacement Fund.</p>	<p>No.</p> <p>Any item that has asset life of less than 5 years is to be priced in Schedule 1 & 2.</p> <p>Any item that has asset life equal or more than 5 years are to be priced in Schedule 6. Also required spare parts for 1 year after Operation Service completion are to be priced in Schedule 6 – Item 4.</p> <p>The distinction is made here between the replacement of assets when they have reached the end of their useful asset lives, and minimising the consequence of a breakdown.</p> <p>The spare parts list and Asset Replacement Fund (ARF) are two different items, and the GCC deals with both.</p> <p>(1) The ARF is for items of plant or equipment that have an asset life that expires during the operation service period and hence must be replaced. This is linked to the accounting concept of depreciation. For this project, the operation service period at seven years is relatively short when compared to the more typical 15 years to 25 years, and hence there are not expected to be many items included in the ARF. There is little judgement required here in that an item of plant or equipment will have a set expected asset life.</p> <p>(2) The spares are items of plant and equipment, or parts thereof, which the contractor must have ready to ensure the proper maintenance of the plant, the proper condition of the assets and the delivery of the product water in accordance with the contract. There is more judgement required here, and relies on the experience of the contractor and the degree of risk it is willing to take.</p> <p>Bidders are advised that the Employer would not look too kindly on the circumstance where an equipment failure resulted in the lengthy reduction of the supply of product water, and where this could have been remedied by having the part that failed readily available in inventory, rather than having to procure it from overseas or have one made up locally.</p> <p>One other point to emphasis is that the ARF applies only to years 6 and 7 (see GCC Clause 14.18 (b)).</p> <p>The cost of the spares in included in the maintenance of the plant (see GCC 14.18 paragraph 5).</p> <p>Note that Maintenance Retention Fund is also maintained to ensure the proper maintenance is carried out (see GCC Clause 14.19).</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
3.	01-01-03		4	4-60 4-61	Schedule 1 & 2	Please confirm that the Mandatory Spares Parts including O&M spares listed in Schedule 1 & 2 will be provided as free-issue to the Contractor during the first 4 years of operation for contractor to carry out its duty and obligations required in the contract.	<p>Any item that has asset life of less than 5 years are to be priced in Schedule 1 & 2. Prior approval shall be obtained from the Employer's Representative before utilisation of those items.</p> <p>The Employer is looking for the delivery of the product water in accordance with the contract and will examine the proposals from the bidders to ensure that it has confidence that this will be achieved.</p> <p>The bidders are expected to provide all the spares and parts (see GCC 14.18 part 5).</p> <p>The contract will be awarded on this basis. There are no free-issue items.</p> <p>Please also refer to Schedule 7 (especially items 01, 02, 05, 06 and 10) page 4-76 for a summary of the items that make up the payment for the Operation Service Period.</p>

No	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
4.	01-01-04		4 & 6	4-60 4-61 6-25	Section 4, Schedule 1&2 Section 6, Clause 1.7	<p>Please confirm that the Contractor is not required to replenish the depleted Mandatory Spare Parts and O&M spare parts issued by Employer during the first 4 years of operation, listed in Schedule 1& 2 which will be utilized during the 7 years of Operation Service</p> <p>Should the Contractor be required to replenish the utilised parts, please confirm whether such cost shall be priced into Schedule 5 - O&M Fees.</p>	<p>Price Schedule 1& 2: Any item that has asset life of less than 5 years is to be priced in Schedule 1 & 2. The Contractor is not required to replenish the depleted Mandatory Spare Parts.</p> <p>Price Schedule 6: Any item that has asset life equal or more than 5 years are to be priced in Schedule 6. Contractor should replenish the depleted Mandatory Spare Parts. Further the Contractor shall provide required spare parts for 1 year after Operation Service completion and this shall be priced in Schedule 6 – Item 4.</p> <p>Prior approval shall be obtained from the Employer’s Representative before utilisation of the Mandatory Spare Parts and O&M spare parts listed in Price Schedule 1, 2 & 6. The Contractor is expected to retain an adequate inventory at all times to maintain the plant in full operating condition as detailed in the bidding document. The Contractor is to include the cost of doing so in its bid price.</p> <p>As described previously spares fall into Schedules 1 and 2 while asset replacements (for assets that have reached the end of their accounting lives (also sometimes referred to as design lives) fall into Schedule 6.</p> <p>Please refer to the Schedules of the bidding document commencing at page 4-59.</p>

No	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
5.	01-01-05		6	6-107	16.1 (m)	Please confirm that the Contractor shall only manage the quantity and types of spare parts provided at the substantial completion date of the construction of SWRO Plant instead of maintaining them at Contractor's cost as the provided spare parts in accordance with Schedule 1&2 should be utilised as free-issue from Employer to Contractor to perform Operation Service for Year 1 to Year 4 during the Operation Service Period. In Year 5 to Year 7, the Contractor shall manage the spare parts inventory by purchasing spare parts according to the Asset Replacement Fund list, hence resulting in no requirement to maintain the quantity and types of spare parts at Contractor's cost.	Price Schedule 1& 2: Any item that has asset life of less than 5 years is to be priced in Schedule 1 & 2. The Contractor is not required to replenish the depleted Mandatory Spare Parts. Price Schedule 6: Any item that has asset life equal or more than 5 years is to be priced in Schedule 6. The Contractor should replenish the depleted Mandatory Spare Parts. Further, the Contractor shall provide required spare parts for 1 year after Operation Service completion and this shall be priced in Schedule 6 – Item 4.
6.	01-01-06		6	6-148	17.7.1	Please confirm when will the Auditing Body shall commence its duties as there is a contradiction between Chapter 6, Clause 17.7.1 where it states at least 30 days before commencement of the Commissioning Period, and in FIDIC Gold Clause 10.3 mentioned the Auditing Body shall commence on the same date as the Operation Services commences.	FIDIC Gold Book Clause 10.3 shall be prevailed.
7.	01-01-07		9	9-11	(B) Payment Procedures Schedule 6: Asset Replacement Fund and Schedule	In relation to Schedule No. 6 Asset Replacement Fund items, Please clarify whether Contractor will receive payment based on price declared in bid submission as per Schedule No. 6 and adjustable as per Appendix 2 – Price Adjustment; or Contractor shall be paid based on actual purchase price of parts at that point in time as evidence through actual import invoices. Please also clarify for payment of duty and taxes, it shall be claimed back from the employer based on actual duty/taxes paid by Contractor, or based on the duty and taxes declared in Schedule No. 6 and subject to Appendix 2 – Price Adjustment.	Contractor will receive payment based on price declared in bid submission and adjustable as per Appendix 2 – Price Adjustment. Employer shall payback the actual custom duty paid by the contractor.

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
8.	01-02-01		Section 6 – Employer Requirementst	Jun-43	3.2.2	<p>“ High Pressure RO Pumps, Motors, Energy Recovery Devices (ERDs), and Variable Frequency Drives (VFDs): A 5 years extended performance efficiency warranty is required, commencing on the date of satisfactory completion of the Project Acceptance Test and initiation of the plant operations phase. “</p> <p>Kindly advice on the understanding as it will be “Limited to workmanship warranties”.</p>	<p>High Pressure Pumps, Energy Recovery Devices and Variable Speed Drives are expected to have asset lives that exceed five years. If any of these items suffer a fault during their first five years of operation (as measured from the date of the commissioning certificate, or the date of an asset replacement) the contractor must remedy the fault at its own cost. The contractor may have redress to the supplier or manufacturer if the item was under warranty and the fault was not due to incorrect installation or misuse. However such a redress is the responsibility of the contractor. The Employer’s interest is in the delivery of the water in accordance with the contract. Whether the fault was the result of poor manufacture, incorrect installation or operational misuse, the responsibility remains with the contractor. The contractor is to maintain a record of all faults and remedial actions as part of its maintenance program and make this information available to the Employer as required and at the hand back. The cost of the maintenance program as anticipated by the contractor is to form part of the contractor’s bid price. Please refer to Schedule 5 page 4-68. See also answers to questions on spares and the asset replacement fund.</p>

No	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
9.	01-03-01	Part I	Section 4 – Bidding Forms	4-10	Bid Security	<p>As per ITB 21.1 of Section 2 Bid Data Sheet, we understand that the bid bond shall be validated till 298 days from the deadline or any extended deadline for submission of bids.</p> <p>In the bid security format provided in Section 4 Bidding Forms, it appears that the requisite bank guarantee is "Open" type bank guarantee without any expiry date explicitly stated on the form. As standard requirement by all issuing banks for bank guarantee, the bank guarantee will need to indicate an actual date as end of validity of the bank guarantee. As such, we proposed the following amendments (Bold and underlined) to the bid security format (in Section 4, page 4-10) as follows:</p> <p>"This guarantee will expire upon the earlier of :</p> <p>(a) if the Bidder is the successful Bidder, upon our receipt of copies of the Contract Agreement signed by the Bidder and the Performance Security issued to you upon the instruction of the Bidder; or</p> <p>(b) if the Bidder is not the successful Bidder, upon the earlier of</p> <p>(i) our receipt of a copy of your notification to the Bidder of the name of the successful Bidder, or (ii) 28 days after the expiration of the Bidder's bid, <u>or</u></p> <p><u>(c)..... (Expiry Date)."</u></p> <p>Please kindly confirm if the proposed amendments are acceptable.</p>	<p>The purpose of the bid bond is to provide an assurance to the Employer that the winning bidder will undertake the contract under the terms at which it bids. The bid bond may be drawn upon if the contractor fails to either execute the contract or provide the required performance and/or payment bonds.</p> <p>298 days provides sufficient time for the bids to be evaluated, and the winning bidder to be notified, accept the contract and provide the require performance guarantees.</p> <p>Until this time all bids remain valid and the bid bonds are required to remain in place. Hence bidders should assume this length of time in the pricing of their respective bids.</p> <p>Having said that the Employer will not unduly hold the bid bonds beyond a time when is it satisfied that it has a contractor ready to proceed with the project.</p>
10.	02-01-01	Part II	Section 6	Page 6-44	Chapter 3.2.3	<p>As per the commissioning requirement in Chapter 3.2.3 of Section 6 Employer's requirement, the bidder shall be responsible for a 30-day Acceptance Test.</p> <p>Please kindly suggest the water quality monitoring (i.e sampling point and frequency) requirement for Raw Water, Potable Water and Concentrate/ Waste Discharge Water during the 30-day Acceptance Test.</p>	<p>The sampling point shall be as follows;</p> <p>Raw Water: Near the intake</p> <p>Potable Water: At the inlet to the potable water tank</p> <p>Concentrate Discharge: at the Discharge Retention Tank</p> <p>Sampling Frequency: As mentioned in Revised Bidding Document: Table 16-3, 16-4 and 16-5</p>

No.	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
11.	02-01-02	Answers for queries			No. 17 No.189	<p>As per No. 17 of Answers for Queries, at the end of the operating period the contractor will ensure that one high-pressure pumps is provided with the inventory of spares at the time of plant handover.</p> <p>However, it is indicated in No 189 of Answers for Queries, only the critical spare parts for the high-pressure pumps instead of the whole unit of pump shall be stored in the warehouse.</p> <p>We understand that No 189 of Answers for Queries shall supersede No. 17 of Answers for Queries, only the critical spare parts for the high-pressure pumps instead of the whole unit of pump shall be stored in the warehouse.</p> <p>Please kindly confirm.</p>	At the end of the operating period the contractor shall ensure that one high pressure pump is provided with the inventory of spares at the time of plant handover.
12.	02-01-03	Part I Part II	Section 4 Section 6	Page 4-64 Page 6-48	Item 10,11 Chapter 3.5.2	<p>We understand that Item 10 Rent, Supply and Maintain (including insurance, fuel, utilities, driver etc.) 6 seat dual AC van and Item 11 Rent, Supply and Maintain (including insurance, fuel, utilities, driver etc.). 4 wheel drive AC cabs are referred to Chapter 3.5.2 Transport Facilities of Section 6 for construction period.</p> <p>As such, we understand that Item 10 Rent, Supply and Maintain (including insurance, fuel, utilities, driver etc.) 6 seat dual AC van and Item 11 Rent, Supply and Maintain (including insurance, fuel, utilities, driver etc.) only need to be budgeted for 30 months, rather than 114 months.</p> <p>Please kindly confirm.</p>	The Contract stands as it is. – 114 months.

No	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
13.	02-01-04	Part I Part II	Section 4 - Bidding Forms Section 6- Employer's requirement	Page 4-66 Page 6- 95	Item 9 of Schedule 4.3 Provision sum Chapter 11.4	<p>As per Chapter 11.4 of Section 6, the Contractor shall facilitate to purchase and handover to the following vehicles as directed by the Employer's Representative.</p> <p>a) Car – 2 nos. b) 4WD Double Cab Pick-ups – 1 no. c) Crew Cab - 1 no</p> <p>We understand that the above said vehicles purchasement including the insurance, fuel, utilities, driver etc. shall be under Item 9 of Price Schedule 4.3 Provisional Sum Please kindly confirm.</p>	The Contractor shall immediately handover the vehicles to Employer's Representative after purchasing.
14.	02-02-01	Part I	Section 4	Page 4-55 Page 4-76	Letter of Price Bid Schedule No.7	<p>We understand that Item 11 Grand Summary Sum (Sub Total - 2 + Provision sum) of Price Schedule No. 7 Grand Summary include 10% Contingency and Total Provisional Sum (price schedule 4.3) which shall be carried to the Letter of Price Bid.</p> <p>Please kindly confirm.</p>	Yes. Item 11 of Schedule No 7: Grand Summary is to be carried to the Letter of Price Bid.
15.	02-02-01	Part III	Section 9	Page 9-2	Notification of Award	<p>We understand that the Accepted Contract Amount for the Contract in the Notification of Award shall be made up of the following components, excluding 10% Contingency.</p> <ul style="list-style-type: none"> - For the Design and Build of the work: Price Schedule 1, 2, 3, 4; - For the Operation Service: Price Schedule 5; - For the Asset Replacement Fund: Price Schedule 6; - Total Provision Sum: Price Schedule 4.3; <p>Please kindly confirm.</p>	The Accepted Contract amount shall be the amount which is corrected and modified in accordance with the Instructions to Bidders and which includes all the items added to the Item 11 of Schedule No 7: Grand Summary plus applicable Custom Duties and VAT.

No	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
16.	03-01-01					<p>This has reference to the pre-qualification mentioned for the contract for design, build and operate (DBO) of a 24 MLD Sea Water Reverse Osmosis (SWRO) Desalination Plant. We have gone through the pre-qualification criteria and understand that it is not as per the ADB/local procurement guidelines. It is surprising that so many ADB assisted tenders are being floated in Sri Lanka with standard ADB guidelines but this particular Jaffna tender has completely deviated from the set guidelines of ADB itself.</p> <p>we have attached a copy of the standard procurement guideline of ADB and it clearly mentions that the "employer can chose to have one or max two projects of similar nature" but in this case 4 plants have been asked for and of these two should be overseas. The question that begs an answer here is that why four and why not five or three or six. Even for the rest of the criteria is vague and critical items like sea water intake and sea water outfall only one project experience is asked for while the main qualification asks for four plants. The pre-qualification sets a 10 year criteria of experience but then on operation and maintenance it says 7 years' experience which is contradictory. Perhaps a contract with 7 years O&M would be appropriate but in last 10 years and operation for 7 years may not be logically possible.</p> <p>These are major deviations from the standards being followed and will limit the tender to a few people leading to very limited competition. Such tenders should be open to high levels of competition to determine the best price and technology. Desalination is no longer a new technology and there is abundant expertise and references all over the world for the same.</p> <p>We sincerely hope that this won't be converted to a limited tender instead of an open bidding document and that fair opportunity will be given as per standard guidelines of ADB.</p>	The Contract stands as it is.

No	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
17.	04-01-01	Part-I,	Section 3	Page 03-06	2. Qualification	<p>This article states : "Except for Sub-clauses 2.3.2, 2.4.1(c), and 2.4.2 (1) it is the legal entity or entities comprising the Bidder, and not the Bidder's parent companies, subsidiaries, or affiliates, that must satisfy the qualification criteria described below".</p> <p>It may kindly be appreciated that Multinational Groups have a network of affiliates Geographically positioned for faster and better Service to the Clients. Most of O&M contracts are signed by the Affiliates on their domestic market for a long term commitment to the Employers. Not accepting references under Sub clause 2.4.1(a) & 2.4.2(b) from Affiliates is too restrictive for such Groups willing to bid. We kindly request to allow references from affiliates under sub clause 2.4.1(a) & 2.4.2(b).</p>	<p>The use of affiliates is permitted for the qualification 2.4.2 (2). This means that the term '2.4.2 (2)' shall be added to the first, second and last paragraphs under '2. Qualifications' in Section 3: EQC of the revised bidding document. Please note that wherever an affiliate is used the condition listed for affiliates must be satisfied. Experience of jointly and severally liable associate and JV Partner could be considered.</p>
18.	04-01-02	Part-I,	Section 3	Page 03-11	Bidders' experience	<p>Many desalination plants have been built in the past 10 years under different contractual schemes, several of them under a Hybrid concept combining Thermal Desalination and Reverse Osmosis (RO) Plants, the RO Plant often being sub-contracted to Specialist Companies under an EP Contract approach. In the interest of a better response to your call for tender and participation of bidders with proven solutions and credentials, please confirm that for the purpose of Pre-qualification, such EP Contracts for RO Plants shall also be accepted where the value of the Bidder's participation in each of such contract exceeds 50 million USD.</p>	<p>If the proposed contract satisfied the following contract ; it will be considered</p> <ol style="list-style-type: none"> 1) within the last 10 years; 2) that have been successfully completed; 3) with potable water production capacity of 24 MLD or more using SWRO Desalination Process; <p>Where the value of the Bidder's participation in Design and Build portion of each contract exceeds USD 50 million.</p>
19.	04-01-03	Vol.1_ Revised bidding document	Section 2	Page 02-05	Bid Data Sheet	<p>We understand there could be up to four currencies the local currency & three foreign currencies. Please confirm.</p>	<p>Currencies could be as follows</p> <ol style="list-style-type: none"> 1. local currency 2. Maximum three foreign currencies 3. Maximum three currencies plus local currency

No	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
20.	04-01-04	Vol.1_ Revise d bidding docum ent	Section 3	Page 3-15 CI 2.5	Subcontr actors'/ Manufact urers" PQ	Please provide the supplier list for the DI piping mentioned in this clause	From the below link supplier's list shall be downloaded http://www.waterboard.lk/web/index.php?option=com_content&view=article&id=137&Itemid=385&lang=en
21.	04-01-05	Vol.1_ Revise d bidding docum ent				Is payment made from the NWSDB to the contractor or can it be directly from the Asian Development Bank	As per the ADB guide line; If the requested bill amount is more than 100,000 USD ; the respective payment will be made from ADB – Direct payment If the requested payment is less than 100,000 USD then NWSDB will made the payment
22.	04-01-06	Vol.1_ Revise d bidding docum ent	Section 2		ITB 11.2 (k)	This demand is a very unusual, over a too long period, with too low thresholds and in for large international groups which have signed thousands of contracts since 2004 worldwide, it is practically impossible to check if all those requirements can be met. Practically how this can be investigated by yourself for all qualified bidders. We suggest the following modification to be considered. All Key DBO Team members shall individually disclose the following information related to their past performance and legal standing (to the best of their knowledge): <ol style="list-style-type: none"> 1. Any Bid, performance, [...] Key DBO Team Member on or after January 1, 2014. 2. Construction or design arbitration or litigation with alleged damages totaling more than one hundred thousand dollars (US\$ 100,000) or 15% of the contract price, whichever is the higher, by a client/employer against any of the Key BDO Members on or after January 1, 2014. 3. Conviction [...] on or after January 1, 2014. 4. Violation of environmental laws [...] over US\$100,000 on or after January 1, 2014. Please note that failure to disclose such events may result in the disqualification of the Bidder.	The date "January 1, 2004" shall be replaced as "January 1, 2012". Replace the wordings " All Key DBO Team Members shall individually disclose the following information related to their past performance and legal standing" with "All Key DBO Team Members shall individually disclose the following information (if there any) related to their past performance and legal standing". The wordings "Please note that occurrence of any of the events described above and/or failure to disclose such events may result in the disqualification of the Bidder." is deleted.

No	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
23.	04-01-07	Vol.1_ Revised bidding document	Section 8	8-2	Sub Clause 4-2	We understand that there is one performance security for DB part and other one for O&M. Please, clarify.	Yes. Confirmed.
24.	04-01-08	Vol.1_ Revised bidding document	Section 6 – chapter 16	6-109	Staffing	Regarding the Operation staffing, please, confirm that Bidder can propose an alternative.	Yes. Confirmed.
25.	04-01-09	Vol.1_ Revised bidding document	Section 6	6-24	Operation service	The operation leadership team must be onsite from commencement of the DBO contract. Please, confirm. All O&M staff must be mobilized onsite 1 month before Commissioning. Please, confirm.	There would be two different teams form DB and OS period. The Employer would like intermittent access to the person in OS during the D-B period, and would expect this person to be present during the commissioning. Including the cost of this in its bid price is a decision for the bidder. But does not change the Employer's Requirements. Having said this apart from commissioning it is not expected that such a person would have a large input.
26.	04-01-10	Vol.1_ Revised bidding document	Section 8	8-18	Custom duties	We understand that taxes and custom duties of the Price Schedule 5 will be borne by the Contractor. Please, confirm.	Price Schedules 1: The Contractor shall initially pay custom duties and taxes for speedy clearance from the port of importation. The Employer shall reimburse the customs duties which includes VAT levied by the Sri Lanka Customs on importing Items in Price Schedule 1 on submission of original customs clearance documents/receipts. Price Schedules 2, 3, 4 and 5: The Contractor shall add VAT to his applications for payment and the Employer would pay the VAT to Contractor. Then the Contractor shall pay VAT to government in accordance with normal Sri Lankan tax practice.

No .	Query No.	Volume	Section	Page	Clause/Line No	Details of Query	Answer
27.	04-01-11	Vol.1_ Revised bidding document	Section 4	4-57	Price schedules 5 and 6	We understand that the amounts in the Price schedule 5 and 6 exclude VAT. Please, confirm.	Yes.
28.	04-01-12	Vol.1_ Revised bidding document	Section 4	4-72	Price schedule 5.3.1	We understand that from year 4 to year 7 of the O&M, the annual electricity consumption to be specified in the price schedule 5.3.1 and price schedule 5.3.3 may be affected by availability factor. Please, confirm.	The Bidder shall quote the power consumption per m ³ of potable water production in Price Schedule 5.3.1 and 5.3.3. Payment shall be made according to Section 9: Appendix 1: Terms and Procedures of Payment and Appendix 7: Functional Guarantee.