

TAMIL NADU WATER SUPPLY AND DRAINAGE BOARD**INTERNATIONAL COMPETITIVE BIDDING****CONTRACT NO: F. Narippaiyur 4.00 mld/SWRO/DO****I/CW/2018-19/Dated.27.06.2019****COVER -I
(REVISED)****REQUEST FOR TECHNICAL PROPOSAL****FOR**

Consultancy services to Conduct Demand Study, Prefeasibility studies including Environmental Feasibility, Preparation of Detailed Project Report, Detailed Engineering (including processing for sanction) & Bid Documents for the installation of 4.00 MLD capacity containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years.

CHIEF ENGINEER**TAMIL NADU WATER SUPPLY AND DRAINAGE BOARD****1/1, Sambakulam, Ganesh Nagar****Opp. To Mattuthavani Bus stand, Melur Road,****Madurai – 625 007****Tamil Nadu, India.****Telephone: 91 452 – 2585339 Fax :91452- 2584595****E-mail: cesrtwad@gmail.com****Web site: www.twadboard.tn.gov.in**

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SECTION -1

TWAD BOARD – INVITATION OF BIDS – TWO COVER –INTERNATIONAL COMPETITIVE BIDDING			
IFB No.	F.Narippaiyur 4.00 mld/SWRO/DO I/CW/2018-19/Dated.27.06.2019		
Fund	NRDWP/ SMS		
Eligibility	National and International consultants / firms		
Tender Invitee	The Chief Engineer, TWAD Board, No.1/1,Sambakulam, Ganesh Nagar,Mattuthavani, Madurai. 625007		
Sale of Bid& Place of Sale	03.07.2019 to 05.08.2019 up to 17.45 pm O/o the Executive Engineer, TWAD Board, RWS Division, Ramanathapuram, Tamil Nadu by cash or by Demand Draft Rs.1000+ GST in favour of Executive Engineer, TWAD Board, RWS Division, Ramanathapuram payable at Ramanathapuram.		
Down loading website	(Free of cost) at www.tenders.tn.gov.in and www.twadboard.tn.gov.in .		
Pre Bid meeting	24.07.2019 at 11.00 hours at the office of the Tender Invitee		
Bid Submission	07.08.2019 before 15.00 hours at the office of the Tender Invitee in person or through post. This office will not be held responsible for postal delay, if any.		
Bid opening	07.08.2019 at 15.30 hours at the office of the Tender Invitee		
Sl. No.	Name of work	Approximate value of work (Rs. in Crore including GST)	Bid security (Rs.in lakh)
1	Consultancy services to Conduct Demand Study, Prefeasibility studies including Environmental Feasibility, Preparation of Detailed Project Report, Detailed Engineering (including processing for sanction) & Bid Documents for the installation of 4.00 MLD capacity containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years.	3.13 (Approx.)	2.40
Chief Engineer (i/c), TWAD Board, Madurai			

Sd/-N. Rajasekar, dt.27.06.2019
 Chief Engineer (i/c),
 TWAD Board, Madurai

TWAD BOARD – INVITATION OF BIDS – TWO COVER –INTERNATIONAL COMPETITIVE
BIDDING

Extension Notice

No. .F.Narippaiyur 4.00 mld/SWRO/DO I/CW/2018- 19/Dated.26.07.2019

Sub:-Consultancy services to Conduct Demand Study, Prefeasibility studies including Environmental Feasibility, Preparation of Detailed Project Report, Detailed Engineering (including processing for sanction) & Bid Documents for the installation of 4.00 MLD capacity containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years– Last date of sale, Last date of submission and Opening date – Extension – reg.

Ref: - INVITATION FOR BID NO. F.Narippaiyur 4.00 mld/SWRO/DO I/CW/2018-19/Dated.27.06.2019

The sale period, Last date of receipt of bid and opening of tender for the above work are here by extended as below:-

Sl .No	Description	Extended up to
1	The last date for Sale of Tender	19 .08.2019 up to 5.45 P.M
2	The last date for receipt of Tender	21 08.2019 up to 3.00 P.M
3	Date & Time of opening of Technical bid	21.08.2019 at 3.30 P.M

The other terms and conditions remains unaltered.

Sd/- N. Ganesan.26.07.19.
Chief Engineer (i/c),
TWAD Board, Madurai

Contractor

Sd/-Chief Engineer, TWAD, Madurai

SECTION – 2

INFORMATION TO CONSULTANTS

1. INTRODUCTION

1.1 The Tamil Nadu Water Supply & Drainage Board otherwise called TWAD Board (herein called as Client) invites sealed proposals from eligible consultants for award of **Consultancy services to Conduct Demand Study, Prefeasibility studies including Environmental Feasibility, Preparation of Detailed Project Report, Detailed Engineering (including processing for sanction) & Bid Documents for the installation of 4.00 MLD capacity containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years.**

1.2 The Consultants are requested to submit a technical and a financial proposal as specified in the Data Sheet (the proposal) for this Assignment.

1.3 The Assignment shall be implemented in accordance with the Terms and Conditions specified in the Data Sheet and other sections of the Document.

1.4 The Consultants must familiarize themselves with local conditions and take them into account in preparing their proposals. To obtain firsthand information on the Assignment and on the local conditions, Consultants are encouraged to pay a visit to the area before submitting a proposal and attend a pre-proposal conference specified in the Data Sheet.

1.5 The Client will provide the inputs specified in the Data Sheet and will assist the Consultants in obtaining licenses and permits needed to carry out the services, and make available relevant project data and reports.

1.6 Please note that (i) the costs of preparing the proposal and of negotiating the contract, including a visit to the area, are not reimbursable as a direct cost of the Assignment; and (ii) the Client is not bound to accept any of the proposals submitted.

1.7. The Client requires that Consultants provide professional, objective and impartial advice and at all times hold the Client's interests paramount, without any consideration for future work and strictly avoid conflicts with other assignments or their own corporate interests. Consultants shall not be hired for any assignment that would be in conflict with their prior or current obligations to other clients, or that may place them in a position of not being able to carry out the assignment in the best interest of the Client.

1.7.1 Without limitations on the generality of this rule, Consultants shall not be hired under the circumstances set forth below:

- a) a firm, which has been engaged by the Client to provide goods or works or services for this Consultancy Service for the same project. Conversely, firms hired to provide consulting services for the preparation or implementation of a Project and any of their affiliates shall be disqualified from subsequently providing goods or works or services related to this Project.
- b) Consultants or any of their affiliates shall not be hired for any assignment, which, by its nature, may be in conflict with another assignment of the Consultants.

1.8. It is the Clients' policy to require that the Consultants observe the highest standard of ethics during selection and execution of any contracts. In pursuance of this policy, the Client:

- (a) defines, for the purposes of this provision, the terms set forth below as follows:
 - (i) "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the selection process or in contract execution; and
 - (ii) "fraudulent practice" means a misrepresentation of facts in or to influence a selection process or the execution of a contract to the detriment of the Client and includes collusive practices among consultants (prior to or after submission of proposals) designed to establish prices at artificial, non-competitive levels and to deprive the Client of the benefits of free and open competition.
- (b) will reject a proposal for award if it determines that the firm recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;
- (c) will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded of a contract if it any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a contract;

1.9 Consultants shall furnish declaration as described in the financial proposal submission form.

2 PREPARATION OF PROPOSAL

2.1 Consultants are requested to submit a technical and a financial proposal (Para 1.2) written in the language specified in the Data Sheet.

The Consultants are required to furnish the Bid Security as detailed in the Data Sheet.

TECHNICAL PROPOSAL

2.2. In preparing the Technical Proposal, Consultants are expected to examine all terms and instructions included in the Documents in detail. Material deficiencies in providing the information requested may result in rejection of a proposal.

2.3. While preparing the technical proposal, Consultants must give particular attention to the following:

- i) *If a firm considers that it does not have all the expertise for the assignment, it may obtain expertise by associating with individual consultant(s) and / or entities in a joint venture relationship as appropriate.* Memorandum of Understanding (MOU) entered among the entities should be enclosed along with their proposal.
- ii) For assignments on a staff-time basis, the estimated number of professional staff-months is given in the Data Sheet. The proposal shall, however, be based on the number of professional staff-months estimated by the firm.
- iii) It is desirable that the Chief Consultant (Team Leader) and Deputy Team Leader of the key professional staff proposed shall be permanent employees of the firm unless otherwise indicated in the data sheet.
- iv) Alternative professional staff shall not be proposed and only one Curriculum Vitae may be submitted for each position;
- v) A good working knowledge of the Language specified in the Data Sheet is essential for key professional staff on this Assignment.
- vi) Reports to be issued by the Consultants as part of this assignment must be in the Language(s) specified in the Data Sheet.

2.4.The Technical Proposal should provide the following information, using the attached Standard Forms (Section 3)

- i) Bid security.
- ii) A brief description of the Consultant's organization and an outline of recent experience on assignments (Section 3 B) of a similar nature. For each assignment, the outline should indicate, inter alia, the profiles and names of the staff provided, duration of the assignment, contract amount and firm's involvement.
- iii) Any comments or suggestions on the ToR and on the data, a list of services and facilities to be provided by the client (Section 3C).
- iv) A description of the methodology and work plan for performing the assignment. (Section 3 D)
- v) The list of the proposed staff team by speciality, the tasks that would be assigned to each staff team member and their timing. (Section 3 E)
- vi) **Recently signed Curriculum Vitae (C.V.) of the proposed professional staff and the authorized representative submitting the proposal (Section 3 F).** Key information should include No. of years working for the firm/entity and degree of responsibility held in various assignments during the last fifteen years.
- vii) Estimates of the total staff effort (professional and support-staff; staff time) to be provided to carry out the assignment, supported by bar chart diagrams showing the time proposed for each professional staff team member. (Section 3 Gand 3 H)
- viii) A detailed description of the proposed methodology, staffing and monitoring of training, if the Data sheet specifies training as a component of the Assignment.
- ix) Any additional information requested in the Data Sheet.

2.5.The technical proposal must not include any financial information.

FINANCIAL PROPOSAL

2.6. In preparing the financial proposal, Consultant is expected to take into account the requirements and conditions of the documents. The Financial Proposal should follow Standard Forms. (Section 4) It lists all costs associated with the Assignment, including

(a) remuneration for staff: The payment to the expatriate consultants will be mentioned in Indian Rupees.

(b) reimbursable such as subsistence (per diem, housing), transportation (local, for mobilization and demobilization), and services and equipment (vehicles, office equipment, furniture and supplies), insurance, printing of documents, surveys. If appropriate, these costs should be broken down by activity in Indian Rupees.

2.7 The financial proposal should clearly identify, as a separate amount, the GST and other impositions imposed under the applicable law, on the Consultants and their personnel unless the Data Sheet specifies otherwise.

2.8 Costs shall be expressed in Indian Rupees only.

2.9 The Consultant shall give a declaration on the financial proposal as in Sec 4A.

2.10 The Data sheet indicates how long the proposals must remain valid after the submission date. The Client will make best effort to complete negotiation within this period. If the client wishes to extend the validity period of the proposals, the Consultants who do not agree have the right not to extend the validity of their proposals.

3. SUBMISSION, RECEIPT AND OPENING OF PROPOSALS

3.1 The original and each copy of the technical and financial proposal must be prepared in indelible ink. It shall contain no inter-lineation or overwriting, except as necessary to correct errors made by the Consultants themselves. Any such corrections must be initialed by the person or person(s) who sign(s) the proposals.

3.2 An authorized representative of the firm shall initial all pages of the proposal. The representative's authorization must be confirmed by a written power of attorney accompanying the proposals.

- 3.3 For each proposal, the Consultant shall prepare the number of copies indicated in the Data sheet. Each Technical Proposal and Financial Proposal shall be marked "Original" or "Copy" as appropriate and there are any discrepancies between the original and the copies of the proposal, the original governs.

The original and all copies of the Technical Proposal shall be placed in sealed envelope clearly marked "**Consultancy services to Conduct Demand Study, Prefeasibility studies including Environmental Feasibility, Preparation of Detailed Project Report, Detailed Engineering (including processing for sanction) & Bid Documents for the installation of 4.00 MLD capacity containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years.**"

– "TECHNICAL PROPOSAL "

and the original and all copies of the Financial Proposal shall be placed in another separate sealed envelope clearly marked "**Consultancy services to Conduct Demand study, Prefeasibility studies including Environmental Feasibility, Preparation of Detailed Project Report, Detailed Engineering (including processing for sanction) & Bid Documents for the installation of 4.00 MLD capacity containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years.**"

. –"FINANCIAL PROPOSAL".

Both envelopes shall be placed into an outer sealed common envelope clearly marked "**Consultancy services to Conduct Demand study, Prefeasibility studies including Environmental Feasibility, Preparation of Detailed Project Report, Detailed Engineering (including processing for sanction) & Bid Documents for the installation of 4.00 MLD capacity containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years.**"

CONTRACT NO: F. Narippaiyur 4.00 mld/SWRO/DO I/CW/2018-19/Dated.27.06.2019 bearing the submission address.

- 3.4 The completed technical and financial proposals must be delivered on or before the time and date stated in the Data Sheet or any extended dates specified.
Any proposal received after the closing time for submission of proposals will not be considered.
- 3.5 After the deadline for submission of proposals, the Technical Proposals shall be opened as indicated in the Data sheet. The Financial proposal will be kept sealed until the Technical proposals are evaluated.

4. PROPOSAL EVALUATION

General

- 4.1 From the time the bids are opened to the time the contract is awarded, if any consultants wishes to contact the Client on any matter related to its proposal, they should do so in writing to the address indicated in the Data Sheet. Any effort by the firm to influence the Client in the Client's proposal evaluation, proposal comparison or contract award decisions may result in the rejection of the Consultant's proposal.
- 4.2 A two-stage procedure will be adopted in evaluating the proposals: (i) a technical evaluation, which will be carried out prior to opening of any financial proposal; (ii) a financial evaluation. Firms will be ranked using a combined technical/financial score, as indicated below:

Evaluation of Technical Proposal

- 4.3 The Evaluation committee appointed by the Client will carry out the evaluation of proposals on the basis of their responsiveness to the ToR, applying the evaluation criteria and point system specified in the Data Sheet. Each responsive proposal will be attributed a technical score (St). A proposal to be considered unsuitable shall be rejected at this stage if it does not respond to important aspects of the Terms of Reference or if it fails to achieve the minimum technical score indicated in the Data Sheet.

Evaluation of Financial Proposal

- 4.4 The Client shall simultaneously notify the Consultants who have secured the minimum qualifying marks, indicating the date and time set for opening the Financial Proposals.
- 4.5 The Financial Proposals of qualified consultants shall be opened in the presence of the Consultants, Representatives who choose to attend. The name of the Consultant, the technical scores and the proposed prices shall be read aloud when the Financial Proposals are opened.
- 4.6 The Evaluation committee will determine whether the Financial Proposals are complete and without computational errors and arrive prices as specified in the Data Sheet. Where there is a discrepancy between the rates in figures and in words, lower of the two will govern.

- 4.7 The lowest Financial Proposal (Fm) will be given a financial score (Sf) of 100 points. The financial scores (Sf) of the other Financial Proposals will be computed as indicated in the Data Sheet. Proposals will be ranked according to their combined technical (St) and financial (Sf) scores using the weights ($T =$ the weight given to the Technical Proposal; $F =$ the weight given to the Financial Proposal; $T + F = 1$) indicated in the Data Sheet: $S = St \times T + Sf \times F$. The firm achieving the highest combined technical/financial score will be invited for negotiations.

5. NEGOTIATIONS

- 5.1 Negotiations will be held at the address indicated in the Data Sheet. The aim is to reach agreement on all points and sign a contract.
- 5.2 Negotiations will include a discussion of the technical proposal, the proposed methodology (work plan), staffing and any suggestions made by the firm to improve the Terms of References (ToRs). The Client and firm will then work out agreed final ToR, the staffing and bar charts that will indicate activities, staff, periods in the field and in the home office, staff months, logistics and reporting. The agreed Work Plan and final ToR will then be incorporated in the "Description of Services" and form part of the Contract. Special attention will be paid to optimize the required outputs from the Consultants and to define clearly the inputs required from the Client to ensure satisfactory implementation of the Assignment.
- 5.3 Prior to the expiry period of proposal validity, the Client will notify the successful Consultant who submitted the highest scoring proposal by registered letter, E-Mail or facsimile and invite it to negotiate the contract.
- 5.4 Financial negotiations will then be carried out.
- 5.5 Having selected the Consultants, among other things, on the basis of an evaluation of proposed key professional staff, the Client expects to negotiate a contract on the basis of the experts named in the proposal and prior to contract Negotiations will require assurances that these experts will be actually available. The Client will not consider substitutions during contract negotiations except in cases of unexpected delays in the starting date or incapacity of key professional staff for reasons of health. If this is not a case and if it is established that key staffs were offered in the proposal without confirming their availability, the firm may be disqualified.
- 5.6 The negotiations will conclude with a review of the draft form of Contract. To complete negotiations the Client and the Consultants will initial the agreed

contract. If negotiations fail, the Client will invite the firm that received the second highest score to contract negotiations and the process will be continued till an agreement is reached.

6. AWARD OF CONTRACT

- 6.1 The Contract will be awarded after negotiations with the successful Consultant. Upon successful completion, the Client will promptly inform the other Consultants that their proposals have not been retained.

The successful consultant is required to furnish the Performance Security in the form of irrevocable bank guarantee as specified in the form of National Savings Certificate / Post Office savings Deposit account purchased within the state of Tamil Nadu and pledged in favour of the Executive Engineer, TWAD Board, RWS Division, Ramanathapuram.

Or

Unconditional and irrevocable bank guarantee issued by any one of the branches of nationalized bank or scheduled bank located in India, provided they are in prescribed format (enclosed in the Document) for an amount equal to 2% of the total value of the contract in favour of the Executive Engineer, TWAD Board, RWS Division, Ramanathapuram as specified in the Special Conditions of Contract and execute the agreement within 28 days from the date of receipt of Letter of Acceptance.

- 6.2 The selected Consultant is expected to commence the Assignment on the date and at the location specified in the Data Sheet.

7. CONFIDENTIALITY

Information relating to evaluation of proposals and recommendations concerning awards shall not be disclosed to the Consultants who submitted the proposals or to other persons not officially concerned with the process, until the winning firm has been notified that it has been awarded the contract.

DATA SHEET**Information to Consultants****Clause****Reference**

1.1 The name of the Client:

Tamil Nadu Water Supply and Drainage Board (TWAD Board)

The method of selection is: **Quality and Cost Based Selection (QCBS)**

The name of the Assignment is: **Consultancy services to Conduct Demand Study, Prefeasibility studies including Environmental Feasibility, Preparation of Detailed Project Report, Detailed Engineering (including processing for sanction) & Bid Documents for the installation of 4.00 MLD capacity containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years.**

1.2 A Technical and a Financial Proposals are requested: **Yes.**

1.3 Assignment Period

A. To conduct Prefeasibility studies, Preparation of Detailed Project Report and Bid documents **: 3 Months**

(Prefeasibility report should be submitted first. After clearance by TWAD Board, Preparation of Detailed Project Report and Bid documents should be done)

Conducting Demand Study, prefeasibility studies, preparation of Detailed Project Report and Bid Documents for the setting up of containerized SWRO for 4.0 MLD capacity-3 Months from the date of signing the agreement

Sl. No.	Description	Time duration	Total Days
1	Submission of Prefeasibility Report including Environmental feasibility& Financial viability	30 days	30 days
2	Submission of Interim Report on draft design, drawings and technical specifications for containerized SWRO plant and all associated works with cost estimate	15 days	45 days
3	Submission of Draft Detailed Project Report including EIA, Rehabilitation, design & detailed engineering and cost estimates for all the components, O&M Manual, analysis for various options for bidding such as EPC with O&M,DBOT, DFBOT or other modes of financing and draft Bid Documents	15 days	60 days
4	Submission of Final Detailed Project Report along with final bid documents	30 days	90 days

1.4Pre-proposal Conference :Yes

1. Date, Time & Venue :21.08.2019 at 11.00 a.m.

in the Office of the Chief Engineer

TWAD Board, 1/1, Sambakulam

Ganesh Nagar, Melur Road

Madurai – 625 007.

The name and address of the client:CHIEF ENGINEER

TWAD Board, 1/1, Sambakulam

Ganesh Nagar, Melur Road

Madurai – 625 007.

Tamil Nadu, India.

2.0The Documents are: Information to Consultants, ToR, Draft form of Contract, Appendices

3.1 The language is: English

Contractor

Sd/-Chief Engineer, TWAD, Madurai

- 3.1.1 The consultants are required to furnish the Bid Security for a value of Rs.2,40,000/- in the following forms

Demand draft/ Deposit call receipt / Fixed Deposit receipt/ Bank Guarantee (Unconditional) for the bid security issued by a Nationalized Bank/ Scheduled Bank located in India/ National Savings Certificate/ Post Office Savings Bank Deposits drawn in favour of the Executive Engineer, TWAD Board, **RWS Division, Ramanathapuram** which is to be kept in a separate cover in the Technical Proposal Envelope while submitting their bid.

FDR and Deposits at call receipts should contain lien certificate issued by the Bank for encashment by department. The FDR furnished but the firm should also bear the signature of the authorized signatory on a revenue stamp at the back of the FDR.

- 3.1.2 Any Bid not accompanied by bid security in stipulated form shall be rejected by the Employer as non responsive.

The Bid Security will be forfeited;

- a) if the consultant withdraws the bid after opening of the Technical Proposal during the Bid Validity Period.
- b) If the consultant does not accept the corrections in the bid price
- c) in case of successful consultant, if the consultants fails within the specified time

- 3.2 i) The estimated number of professional man months required for this assignment is

- a) For conducting prefeasibility studies, preparation of Detailed Project Report and Bid document - **25 man months.**

- ii) The Team Leader & the Deputy Team Leader must be permanent employees of the consultancy firm

- iii) The estimate of the man month required is based on the assessment of the Board. The consultants are free to vary the professionals and their man months based on their experience. But the Board will group the experts chosen in accordance with the broad classification given in Item (iv) below

iv) The desirable qualifications and over all experience of the proposed staff

Sl. No.	Category Name	Qualification & Discipline	Years of Experience	Expertise required	No. of Man months required
1	2	3	4	5	6
1.	Chief Consultant (Team Leader)	Master Degree in any discipline of Civil / Mechanical/ Electrical/ Chemical Engineering/ Public Health Engineering/ Environmental Engineering	15	Should have served as Chief Consultant or head of the Designing unit and should have prepared Detailed Project Report including Design & Detailed Engineering and Bid document for at least one Sea Water Reverse Osmosis Desalination Plant of capacity of 2 MLD. a) for preparation of detailed Project Report and Bid documents	3
2.	Deputy Team Leader	Master Degree in any discipline of Civil/ Mechanical/ Electrical/ Chemical Engineering/ Public Health Engineering/ Environmental Engineering.	10	Should have served as Technical Adviser or in senior capacity and should have experience in the preparation of Detailed Project Report including Design and Detailed Engineering and Bid document for at least one Sea Water Reverse Osmosis Desalination plant of capacity of 2 MLD. a)for preparation of Detailed Project Report and Bid documents	3

Sl. No.	Category Name	Qualification & Discipline	Years of Experience	Expertise required	No. of Man months required
3	Plant Design Engineer.	Master Degree / Bachelor Degree in any discipline of Civil/ Mechanical/ Electrical/ Chemical Engineering / Public Health Engineering/ Environmental Engineering	7 for ME & 10 for BE	Should have designed & carried out Detailed Engineering for SWRO plant for at least one SWRO Desalination Plant of capacity of 2 MLD.	3
4	Pretreatment Design Engineer.	Master Degree/ Bachelor Degree in Mechanical/ Chemical Engineering.	7 for ME & 10 for BE	Should have designed pretreatment units with Detailed Engineering for Desalination Plant	2
5.	Environmental specialist	Master Degree in Environmental Engineering / Public Health Engineering	7	Should have experience in carrying out EIA/EAP&EMP and mitigation plans for large-scale infrastructure projects.	2
6	Design Engineer (Civil)	Master Degree in Civil Engineering (Structural Engineer)	7	Should have served as a Senior Engineer in project formulation, Design and Detailed Engineering of civil structures a) for preparation of Detailed Project Report and Bid documents	3

Sl. No.	Category Name	Qualification & Discipline	Years of Experience	Expertise required	No. of Man months required
7	Design Engineer (Mechanical)	Master Degree/ Bachelor Degree in Mechanical Engineering	7 for ME & 10 for BE	Should have served as Senior Engineer in project formulation, Design and Detailed Engineering for mechanical works including piping a)for preparation of Detailed Project Report and Bid documents	3
8.	Design Engineer (Electrical & Instrumental Control System)	Master Degree/ Bachelor Degree in Electrical/ Instrumentation Engineering / Electrical & Electronics Engineering	7 for ME & 10 for BE	Should have served as Senior Engineer in project formulation, Design and Detailed Engineering of Electrical and Instrumentation control a)for preparation of Detailed Project Report and Bid documents	3
9	Contract Specialist	Bachelor Degree in Engineering in any discipline/ Law	7	Should have prepared Bid Documents covering legal and contractual aspects of large infrastructure projects. a)for preparation of Bid documents	3

Note: The Consultants shall indicate the name of the personnel who has to be awarded marks for evaluation purpose.

- 3.3 i) Language preferable : **English& Tamil**
(ii) Reports must be written in : **English**

- 3.4 Training is a component of this Assignment : **No**

3.5 Tax liability, insurance

**: The Clause 1.10 of General
Conditions and Special Conditions**

3.6. Proposals must remain valid for a period not less than **One hundred and eighty (180) days** after the due date for bid submission.

3.7 The number of copies of the proposal is: **Technical and Financial
Proposals are to be furnished in two
copies each (one original and one
copy)**

4.1 The address for information, delivery and opening:

**CHIEF ENGINEER
TAMIL NADU WATER SUPPLY AND DRAINAGE BOARD
1/1, Sambakulam, Ganesh Nagar
Opp. To Mattuthavani Bus stand, Melur Road
Madurai – 625 007
Tamil Nadu, India.
Telephone: 91 452 – 2585339 Fax : 91 452 - 2584595
E-mail: cesrtwad@gmail.com
Web site: www.twadboard.tn.gov.in**

4.2 Last date & Time for receipt of bids **: Upto 3.00 p.m. on 21.08.2019**

4.3 Date & Time for opening of bids **: At 3.30 p.m. on 21.08.2019**

The location is **: Office of the Chief Engineer**

**TWAD Board, 1/1, Sambakulam
Ganesh Nagar, Melur Road
Opp. To Mattuthavani Bus stand
Madurai – 625 007.**

5.1. Contact address **: CHIEF ENGINEER**

**TWAD Board, 1/1, Sambakulam
Ganesh Nagar, Melur Road
Madurai – 625 007.
Tamil Nadu, India.**

5.2 The No. of marks to be given under each of the evaluation criteria are as follows.

Marks.

I. Specific Experience of the Consultancy Firm related to the Assignment - 40

(Experience of firms during the last 5 years will be considered for evaluation)

To qualify in this consultancy proposal, the single consultancy firm must have prepared Detailed Project Report for at least one number of 2 MLD or above capacity Containerized or Land based Sea Water Reverse Osmosis Desalination Plant. The said 2 MLD capacity plant should have been commissioned and functioning satisfactorily for at least one year within the last five years period.

a) Experience in preparation of Detailed Project Report	-	20
For Containerized or Land based SWRO plant of 2 MLD or more Capacity		
4 or more projects (8 MLD or more)	-	20
3 projects (6 MLD)	-	15
2 projects (4 MLD)	-	10
b) Experience in preparation of bid document	-	20
for Desalination projects		
4 or more projects (8 MLD or more)	-	20
3 projects (6 MLD)	-	15
2 projects (4 MLD)	-	5

II Qualifications and Competence of the Key staff for the assignment - 60

The following key staff only will be evaluated. The respective weightages are:

Sl. No.	Key staff position	Maximum marks assigned for each category for scoring of 60 marks.
1.	Chief Consultant	15
2.	Deputy Team Leader	10
3.	Plant Design Engineer	8
4.	Environmental Specialist	5
5.	Pretreatment Design Engineer	5
6.	Design Engineer (Civil, Electrical & Instrumentation and Mechanical)	12 (4 marks for each category)
7.	Contract Specialist	5
	Total	60

The qualification of staff will be evaluated based on the following criteria:

A. General Qualifications - 20

i. Education - 6

- a) Masters degree = 6
- b) Bachelors degree = 5

ii. Professional Expertise in relevant field

(As specified for each category in column 5 under section (iv) of Qualification and Experience criteria) - 10

For Sl.No. 1

15 years and above - 10

For Sl. No.2

10 years and above - 10

For Sl No. 3 to 9

7 years and above but less than 10 years -7

10 years and above - 10

iii. Types of positions held - 4

Senior Position	=	4
Middle level Position	=	3
Others	=	2

B. Adequacy for the assignment - 40

1. For Chief Consultant & Deputy Team Leader.

- i) Experience in preparation of Detailed Project Report - 20
including preparation of Design and Detailed
Engineering for Containerized or Land based SWRO Desalination plants
(As specified for each category in column 5
under section (iv) of Qualification and

Experience criteria)

4 or more projects (8 MLD or more)	-	20
3 projects (6 MLD)	-	15
2 projects (4 MLD)	-	10

- ii) Experience in preparation of Bid documents - 20

4 or more projects (8 MLD or more)	-	20
3 projects (6 MLD)	-	15
2 projects (2 MLD)	-	10

2. For the Key Staff under Sl. No: 3 to 5

Expertise in relevant field

(As specified for each category in column 5

under section (iv) of Qualification and

Experience criteria) - 40

4 or more projects (8 MLD or more)	-	40
3 projects (6 MLD)	-	30
2 projects (4 MLD)	-	20

- 3.** For the Key Staff under Sl. No: 6 to 8
 Expertise in relevant field
 (As specified for each category in column 5
 under section (iv) of Qualification and
 Experience criteria) **- 40**

Experience in preparation of Detailed Project Report
 including preparation of Design and Detailed

Engineering for SWRO Desalination plants - 30

4 or more projects (8 MLD or more)	-	30
3 projects (6 MLD)	-	20
2 projects (4 MLD)	-	15

Experience in Preparation of Bid documents - 10

4 or more projects (8 MLD or more)	-	10
3 projects (6 MLD)	-	7
2 projects (4 MLD)	-	5

- 4.** For the Key Staff under Sl. No: 9
 Expertise in relevant field
 (As specified in column 5
 under section (iv) of Qualification and
 Experience criteria) **- 40**

Experience in Preparation of Bid documents

4 or more projects (8 MLD or more)	-	40
3 projects (6 MLD)	-	30
2 projects (4 MLD)	-	20

Note: The marks assigned from the above basis for individual key staff of various categories will be added on and then the total marks obtained would be divided by the strength of that category. These marks would then proportionately allotted to each category of each staff based on the maximum marks indicated in the table and then totaled.

Only the firm getting minimum pass marks of 60 will be considered for opening of financial package.

The formula for determining the financial scores is the following:

($S_f = 100 \times F_m/F$, in which S_f is the financial score, F_m is the lowest price among the Consultancy Firms and F is the price of the proposal under consideration of the Consultancy Firm).

The weights given to the technical and financial proposals are:

T = 0.6, and F = 0.4

The assignment is expected to commence immediately on receipt of letter of acceptance for this work.

The Address for negotiation is: Chief Engineer

TWAD Board, 1/1, Sambakulam
Ganesh Nagar, Melur Road
Opp. To Mattuthavani Bus stand
Madurai – 625 007.

- 6.1. Commencement of Assignment: The assignment is expected to commence immediately on receipt of Letter of Acceptance for this work. The assignment location is at Narippaiyur, Ramanathapuram District, Tamil Nadu, India.

SECTION – 3 TECHNICAL PROPOSAL– STANDARD FORMS

3A	Technical Proposal submission form
3B	Firm's references
3C	Description of methodology and work plan for performing the assignment
3D	Composition of Team Personnel and Task(s) of Each Team Member
3E	Format of Curriculum Vitae (CV) of proposed Professional Staff
3F	Time schedule for professional personnel
3G	Activity (work) schedule

3A –TECHNICAL PROPOSAL SUBMISSION FORM**From****To**

Sir,

Subject: Engaging Consultants for -----

----- Technical Proposal.

I/We the undersigned, offer to provide the consulting services for the above in accordance with your Notice Inviting Proposal. We are hereby submitting our Proposal, which includes this Technical Proposal, and a Financial Proposal sealed under a separate envelope and both envelope of Technical proposal and Financial proposal placed into an outer sealed common envelope. Our proposal is binding upon us and subject to the modifications resulting from contract negotiations.

We understand you are not bound to accept any Proposal you receive.

Yours faithfully,

Authorized Signature

Name and Title of Signatory

Name of the firm

Address

3B – FIRM’S REFERENCES

Relevant Services carried out in the Last Five years that best illustrate Qualifications

Using the format below providing information on each reference assignment for which your firm/entity, was legally contracted.

Assignment Name : Country/location :

Location within Country : Professional staff provided
By your firm/entity :

Name of Client : No. of Staff :

Address : No. of Staff-Months, duration of
assignment :

Start Date (Month/Year) : Completion Date(Month/Year):

Approx. value of Services :

Name of Senior Staff (Project Director/Coordinator, Team Leader) involved and functions performed:

Narrative Description of Project:

Description of Actual Services provided by your Staff:

Notarized copy of the Performance certificate issued by the Client / Owner of the Project for having satisfactorily completed the assignment/consultancy has to be enclosed for each work.

Consultants'/Firms Name:

**3C– DESCRIPTION OF THE METHODOLOGY AND WORK PLAN FOR
PERFORMING THE ASSIGNMENT**

**3 D- COMPOSITION OF THE TEAM PERSONNEL AND TASK(S) OF
EACH TEAM MEMBER**

1 Technical/Managerial Staff

S.No.	Name	Position	Task
1.			
2.			
3.			
4.			
5.			
..			
..			

2 Support Staff

S.No.	No. of Staff	Position	Task
1.			
2.			
3.			
4.			
5.			
..			
..			

3E- FORMATS OF CURRICULUM VITAE (CV) FOR

PROPOSED PROFESSIONAL STAFF

Proposed position :-----

Name of firm :-----

Name of Staff :-----

Profession :-----

Date of Birth :-----

Years with Firm :-----

Nationality :

Membership of Professional Societies:-----

Detailed Tasks Assigned -----

Key Qualifications

*(Give an outline of staff member's experience and training most pertinent to tasks on assignment. Describe **degree of responsibility held** by staff member on relevant previous assignments and give dates and locations. Use upto half a page).*

Education

*(Summarize College/University and other specialized education of staff member, giving names of colleges, dates attended and degrees obtained, Use up to a quarter page. **Notarized copy of the degree certificate for each personnel has to be enclosed**).*

Employment Record

(Starting with present position, list in reversed order, every employment held. List all positions held by staff member since graduation, giving dates names of employing organization, title of positions held and location of assignments. For experience in last ten years, also give types of activities performed and client references, where appropriate. Use up to three-quarters of a page).

Language

(Indicate proficiency in speaking reading and writing of each language by "excellent", "good", "fair", or "poor").

Certification

I, the undersigned, certify that to the best of my knowledge and belief, this bio-data correctly describes my qualifications and my experience.

-----Date:-----

Signature of Staff Member and authorized official from the firm

(The CVs without the signature of the Staff members and the CVs with scanned signature of the staff member will not be considered for evaluation)

3F – TIME SCHEDULE FOR PROFESSIONAL PERSONNEL

Sl. No	Name	Position	Reports Due / Activities	Months (in the form of bar chart)					Number of Months
				1	2	3	...	11	
1									Subtotal (1)
2									Subtotal (2)
3									Subtotal (3)
4									Subtotal (4)

Full -time : Part-time : Signature:

Reports Due : (Authorized Representative)

Activities Duration: Full Name & Address:

Contractor

Sd/-Chief Engineer, TWAD, Madurai

3 G. ACTIVITY (WORK) SCHEDULE

Sl. No	Item of Activity (Work)	Monthwise program (in the form of chart)				
		1	2	3	11

SECTION-5-TERMS OF REFERENCE

Consultancy services to Conduct Demand Study, Prefeasibility studies including Environmental Feasibility, Preparation of Detailed Project Report, Detailed Engineering (including processing for sanction) & Bid Documents for the installation of 4.00 MLD capacity containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years.

Background

Ramanathapuram District is an administrative district of Tamil Nadu state in southern India. The city of Ramanathapuram is the district headquarters. Ramanathapuram District has an area of 4123 Sq.km. It is bounded on the north by Sivaganga District, on the northeast by Pudukkottai District, on the east by the Palk Strait, on the south by the Gulf of Mannar, on the west by Thoothukudi District, and on the northwest by Virudhunagar District. The District Comprises of 4 Municipalities, 7 Town Panchayats and 2441 rural habitations in 11 blocks.

Narippaiyur is a coastal village situated in the Gulf of Mannar nearer to Sayalkudi in Ramanathapuram District. TWAD Board had established 3.80 mld sea water Desalination plant to cater domestic needs at the rate of 15LPCD to 306 habitations in Kadaladi, Mudukulathur and Kamuthi Union of Ramanathapuram District.

1.1 Scope of the project

This project involves providing drinking water for domestic need at rate of 55 LPCD to the public residing in the project area in Ramanathapuram District as detailed below.

- 174 Rural habitations in 50 Village Panchayats of kadaladi Union
- 71 Rural habitations in 18 Village Panchayats of kamuthi Union
- 61 Rural habitations in 21 Village Panchayats of Muthukulathur Union

Totally about 266316 population of public in above 306 rural habitations are benefitted from Narippaiyur CWSS which supplied desalinated water from the 3.8

MLD capacity desalination plant installed in year 1999. Due to aging and non-availability of spares, the existing Desalination Plant is not operational now. Since new cost effective technologies are emerging now, it is proposed to replace this plant with a containerized SWRO plant. The advantage of this containerized plant is that it meets the drinking water need in the quickest possible time of less than two months.

TWAD Board will take care of Distribution of produced water by providing necessary infrastructure arrangements viz., Sumps, Pumping Main, Pumpsets, Branch Mains, Service Reservoirs, Distribution System etc., separately.

1.2 Project area

The project area comprises of 306 rural habitations in Kadaladi, Mudukulathur and Kamuthi Union of Ramanathapuram District.

1.3 Population and requirement:

The population for the base year (2020) is 266316 and for the ultimate stage (2050) is 266316. The water demand adopting 55 lpcd for 306 rural habitations after deducting the existing sustainable supply works out to 4.0 MLD.

1.4 Existing water supply arrangements

In Ramanathapuram District, the Ramanathapuram Mega CWSS executed at a cost of Rs.672 Crores caters to the drinking water requirement of the entire District with River Cauvery as source.

In addition to the above, many Individual Power Pump Schemes with local sources are also available.

1.5 Need for desalination plant

This District faces water scarcity problems due to saline nature of the ground water and depleting river sources and due to failure of monsoon. Especially, the coastal areas in Kadaladi, Ramanathapuram, Rameswaram and Thiruvadanai Taluks are facing severe water scarcity problems.

Considering the goal of the Government to provide drinking water at the pro rata supply of 55 lpcd to the rural habitations, the drinking water requirement of the public in the year 2050 after deducting the quantity available from the existing arrangements is estimated to be in the order of 4.0 MLD.

In view of the problems of depletion in ground water, surface water and sub surface water, added with monsoon failure and considering the increasing demand, it is need of the hour, to go for Desalination Plants, treating sea water which is available in abundance.

1.6 Proposal in brief

The Intake arrangement available to tap sea water cannot be utilized as it is not in use for a long time due clogging, sedimentation and growth of marine organisms. However after detailed study and analysis of existing intake arrangement system, new intake system will be provided to tap sea water and gravitated to the proposed sump of suitable capacity at off-shore. From the sump sea water will be pumped to the Pre-treatment system and to containerised plant consisting of the following components.

- Sea Water feed pump capable of 2m static lift
- Coagulation, flocculation, settling and filtration
- Auto-backwashing strainer for removal of suspended solids prior to filtration
- Filtration system is for the removal of colloids, suspended solids and protection of the downstream processes, operating at a conservative flux due to the nature of the feed water (seawater)
- Antiscalant and SMBS dosing for RO feed conditioning □
- RO system equipped with an energy recovery device removal of dissolved solids to produce product water of TDS less than 500 ppm PH 7 to 8.5 with LSI slightly positive.
- A calcite contact vessel for remineralisation (adjustment hardness) of the treated water

The treated water from the plant will be collected in a sump of suitable capacity. From the collection sump, water will be distributed to the beneficiaries through a network of pipeline and pumping stations. The reject from the plant will be discharged back into Sea with suitable outfall arrangements.

1.7. Design Basis for the Containerised Plant

a. Plant Capacities

Based on the requirement of 4.0 mld product water.

b. Feed and Treated Water Quality

In the absence of any detailed analysis for raw sea water (feed water), the following typical water analysis is proposed as the design basis for the plant:

S.No	Parameter	Units	Design Limits
1	Water temperature	0 C	20 – 35
2	Colour	HU	< 3
3	Odour	-	Unobjectionable
4	pH	-	7.5 – 8.5
5	Total Dissolved Solids	mg/l	35,000
6	Total Suspended Solids	mg/l	< 5
7	Turbidity	-	5 – 10
8	Heavy metals	mg/l	mg/l < 0.05
9	Oil & grease	mg/l	Non-detectable

Notes:

1. In case the actual feed water quality deviates from the above, the plant output (quality and quantity) may be impaired and a process or equipment change may be necessary to achieve the target parameters.

c. Product Water Quality

Based on modelling using membrane manufacturer's software, and the above feed water quality, the offered reverse osmosis system will produce potable water of the following quality: Parameter	Units	Value
Total Dissolved Solids (calc)	mg/l	< 500
pH	-	6.5 – 8.5

d. Process Description

Containerised seawater desalination plant is based on the following unit operations to produce the required product water.

e. Intake pump & pre-chlorination

Suitable diameter intake line be installed from an intake pipe / channel and connected to sea water feed pump container. The static lift on the suction of the seawater intake pump should not exceed 2.0m. If required to minimise the suction lift, the intake pump container may need to be installed into a concrete sump.

The sea water intake line is proposed to be shock dosed with sodium hypochlorite for disinfection purposes and improved control over seawater organism growth.

f. Coagulation, flocculation, settling & filtration

The water from the intake system is pumped to flash mixer, where ferric chloride will be dosed. Coagulant dosed water will be flocculated in the flocculation chamber and settled in the lamella clarifier for the removal of large suspended solids. Pre-screening is an important part of the pre-treatment process to ensure particles do not damage the downstream membrane.

g. Pressure sand filtration

The settled water from lamella clarifier shall be collected and filtered through Pressure sand filter having fine sand filter media.

h. Dual media pressure filtration

The filtrate from Pressure sand filter shall be further filtered through Dual media pressure filters for effective removal of fine suspended particles.

The Pressure sand filters and Dual media filters shall be backwashed as and when required with the dedicated Backwash pumps with DMF filtered water.

i. Filtrate storage

DMF filtrate is stored in an intermediate DMF Filtrate Tank. It is then pumped to the RO system for removal of dissolved solids.

The Filtrate Tank also provides clean water for backwashing of PSF and DMF.

j. Reverse Osmosis (RO)

Upstream of the RO units a cartridge filter is used to capture any fines that may have been present in the UF Filtrate Tank and act as a final protective barrier for the RO membranes. The RO feed water is chemically conditioned with antiscalant and sodium meta-bisulphite (SMBS) make it suitable for the RO unit. Antiscalant reduces the scaling potential of the feed to the membrane and SMBS deactivates any free chlorine in the water, which would otherwise be harmful to the membranes. As the feed water enters the RO system, a high pressure pump boosts the pressure in the feed above the osmotic pressure of the RO membrane.

Most of the large dissolved salt particles are retained on the feed side of the membrane, while the smaller water molecules pass through, producing permeate with significantly reduced Total Dissolved Solids (TDS). The high pressure RO pump is fitted with a variable speed drive (VSD) to automatically compensate for the varying feed water conditions. The RO plant is designed to operate at a recovery of 85%.

The 'concentrate' or 'reject' stream produced by the RO system is discharged to the plant's reject outfall.

k. Clean-in-Place (CIP) system

Periodically (roughly once in 3 months), the RO plant will need to be shut down for chemical cleaning for around 6 - 8 hours. Cleaning is in-situ and is usually termed as Clean-in-place (CIP). Each stage of the RO trains will be cleaned separately.

RO CIP must be done with an operator in attendance to help in observing any potential issues on the plant. This is a preventive maintenance procedure and can be planned around the operational requirements of the downstream user. As part of our offer, we have included all the equipment needed for chemical cleans. Water for cleaning will be taken from the RO permeate line.

l. RO reject and waste water disposal

Waste water produced to be delivered into discharge system to be provided.

Design Features and Benefits

- PSF & DMF followed by Cartridge Filters provide for excellent removal of sediments from the water, thus providing reliability of operation with reduced risk of RO membrane fouling.
- Conservative RO membrane fluxes selected in design, manufacturing and operating plants. While this means somewhat more membranes/membrane area is used, it provides long term benefits of reduced membrane fouling and cleaning frequencies resulting in longer membrane life, lower operating costs and increased plant's reliability.
- The high pressure RO feed pump is designed wide operating range to accommodate changes in conditions – water TDS and temperature, and membrane condition/age. By sizing the pumps for the worst case scenario (highest TDS, coldest water and 3 year old membranes). Design ensures that the plant can operate at design capacity and recovery despite temperature variations and even as the membranes near the end of their life.
- RO Pump control using VFD's allows the feed pressure to vary, thereby ensuring that the plant output capacity and quality can be monitored and controlled very accurately. This minimizes operator input while maintaining membranes in optimum condition.
- VF driven Pumps allow a smooth speed increase, which reduces the pressure shock that membranes typically are subject to in a DOL start. This extends membrane life and reduces operating costs.
- Accurate detailed monitoring of plant performance, so that any decline in performance may be detected at a very early stage, while the membranes are still easily recoverable. This reduces operating costs.
- Ready to deploy containerized plant, inclusive of all required interconnecting piping, will deliver a significantly reduced time and cost of installation and commissioning.

m. Electrical and Control Specification

The plant is automated using a PLC with touchscreen HMI which provides for full local control and monitoring of key process parameters. The control system can also be connected to computer program for 24/7 remote control and monitoring in support of on-site operations if required.

No UPS or surge protection is currently included but if required can be provided at an additional cost.

n. Electrical supply

Suitable power supply will be obtained from the TNEB. Power Supply to Plant MCC is required at 400V / 690V / 11kV, 50 Hz, 3-phase + Neutral + Earth. The power supply should be free of any spikes or dips. Suitable power supply will be obtained from the TNEB. Should any UPS or surge protection be required, this may be offered at additional cost.

o. Control System

The plant is fully automated using a PLC based system which allows control and monitoring of key process parameters. Installed in the MCC, the PLC will include an HMI touch screen for Operator access. The control system can be connected to site SCADA or DCS system (for monitoring) via Ethernet protocol. Process equipment will be provided with instrumentation for control of plant, and pre-installed equipment skids. All instruments on skids will be terminated at local junction boxes.

p. Deliverables under the Scope of Work

- Supply of design & engineering
- Preparation and supply of Pre-treatment/RO Plant
- Equipment testing prior to dispatch
- Supply of equipment ex-works supplier's facility
- Other services provided on a Schedule of Rates and cost
 - Attendance at HAZOP, Safety in Design
 - Installation supervision

- Pre-commissioning, commissioning
- Training package for Client

q. Civil Works

All civil related works are to be undertaken by Construction Sub-contractor.

Design guidelines including dimensions, working weights and layout of the plant shall be provided during the mobilisation phase by supplier for the client to carry out all required works. The proposed plant will be placed on a suitably designed concrete slab with adequate drainage systems.

The High Pressure RO pump skid / base will be encased in a suitably designed concrete slab in accordance with supplier guidelines.

1.8.Operation& Maintenance:

The Containerized plant after 5 years O&M by the supplier is to be handed over to TWAD Board.

1.9. Objective

The scope of work under this consultancy is to conduct Prefeasibility studies including environmental feasibility, options for financial modules & financial viability, for setting up of containerized SWRO for 4.0 MLD capacity with either 1 module or more than 1 module of various capacities, instead of existing defunct Narippaiyur Desalination Plant, Preparation of Detailed Project Report (including processing for sanction) & Bid Documents for the selected capacities totaling 4.0 MLD as decided by the TWAD Board for the installation of containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years

2.1. Scope of consultancy work

The scope of work under this consultancy is to conduct demand study prefeasibility studies including environmental feasibility for setting up of 4.0 MLD capacity containerized SWRO Desalination Plant, preparation of the Detailed Project Report containing preliminary assessment, Detailed Design Engineering, Cost Estimates and preparation of Bid Documents for the following works:

- i) The selected consultancy firm has to advise TWAD Board appropriate ways to install the containerized SWRO for 4.0 MLD capacity based on pre feasibility study including Environmental feasibility study , financial viability and structuring of the project
- ii) On clearance by TWAD Board, the scope of work under this consultancy is to prepare Detailed Project Report containing preliminary assessment including EIA report and CRZ Clearance, Detailed Design Engineering with reference to operational efficiency and output efficiency, Cost Estimates, preparation of Bid Documents and analysis of options for EPC with O & M, DBOT, DFBOT etc., for installation of the containerized SWRO for 4.0 MLD capacity including the O&M of the Plants and all allied units for 5 years. Consultancy firm has to process the detailed project report for sanction with assistance of TWAD Board. It has to appraise the project and furnish the required documents necessary for getting approval from the funding agency.
- iii) The scope of work for the selected consultancy firm is to be received for the work of for installation of the containerized SWRO for 4.0 MLD capacity
- iv) The Bid document should have flexibility to suit the modification of design offered by the executing Contractor.
- v) In the Bid document milestones should be defined properly.
- vi) Provision for Performance based incentive or penalty should be incorporated in the Bid document.
- vii) Training module for TWAD Board staff should be suggested and provision should be made in the Detailed Project Report.

2.2 Data collection

- i. The Consultants have to collect basic data in respect of the location(s) for installation of the Plant(s), such as Data on Sea Water / Intake Water covering quality of sea water, Indicative temperature, salinity and seasonal variations, data required for raw water intake system designs and reject disposal system design (Bathymetric Studies - For every 25m) and strategy for optimizing quality of Intake water based on site conditions and the details of High Tide Line (HTL) and Low Tide Line (LTL).
- ii. The Consultants has to make necessary studies on soil strata and to ensure that necessary provisions are made for such site conditions for providing intake and outfall pipeline corridor and also for various units in onshore with cost effective solutions.
- iii. Consultants should consider various issues related to the Capital and O&M cost including power consumption in order to optimize the project life cycle cost.
- iv. Consultants have to identify the location for tapping the required power to the proposed plant from the Tamil Nadu Electricity Board (TNEB) power grid.

2.3 Requirement for preparation of design and detailed technical specifications for the proposed desalination plants:

The consultants shall conduct Demand study prefeasibility studies including environmental feasibility for setting up of 4.0 MLD capacity containerized SWRO, prepare the Detailed Project Report containing preliminary assessment, Detailed Design Engineering, Cost Estimates and preparation of Bid Documents. The consultants shall prepare the detailed design and detailed technical specifications for 4.0 MLD capacity containerized SWRO for Narippaiyur Desalination plant , suitable to the site condition.

This will broadly comprise of the following but not restricted to;

- i) Conducting prefeasibility studies including identifying the location for setting up of the plant, environmental feasibility to setup the containerized SWRO desalination plants.

- ii) Carrying out Topographic Survey of the site and preparation of topo – drawings.
- iii) Conducting Soil Investigation and analysis seismic, rainfall, wind and temperature.
- iv) Preparation of Design, Detailed Engineering and Specifications for process units, piping and allied utilities of the Plant.
- v) Preparation of Design, drawing and Detailed Technical specifications for the following:
 - a) Sea water intake system.
 - b) Pre treatment Units
 - c) Containerized SWRO Plant
 - d) Energy recovery System
 - e) Post treatment unit
 - f) Reject Disposal System
- vi) Preparation of Plant layout, Pipeline and Instrumentation Diagrams (P&IDs) and Hydraulic Profile
- vii) Preparation of Detailed Design, drawings and Detailed Technical Specifications for all mechanical equipments and on site piping valves and fittings.
- viii) Preparation of Detailed Design and Detailed Technical Specifications for all Electrical Equipments and Single Line Diagram (SLD).
- ix) Preparation of Detailed Design and Detailed Technical Specifications for Instrumentation equipment, Instrumentation control Philosophy and Instrumentation Schematics with drawings.
- x) Preparation of Detailed Engineering and Specifications for the sustained feed water quality.
- xi) Preparation of Detailed Engineering and Specifications for the all the treatment units for the Product Water quality conforming to drinking water standard as per IS 10500-1991 and as amended from time to time and now.
- xii) Preparation of Detailed Engineering for minimization of water losses in process operations.

- xiii) Assessment of power requirement for the plant, detailed design and drawings for electrical sub-station and preparation of Yard drawing including distribution arrangements to the process units, lighting etc.,
- xiv) Identify the location for tapping the required power to the proposed plant from the Tamil Nadu Electricity Board (TNEB) power grid.
- xv) Preparation of Detailed Design, drawings and Technical Specifications for buildings and all other civil structures.
- xvi) Preparation of Detailed Design, drawings and specifications for in-plant roads, drainage, utilities and landscaping.
- xvii) Preparation of Detailed Technical specifications for all construction materials, construction methodology and stage wise test to be carried out prior to acceptance.
- xviii) Conducting survey of the possible suppliers of the equipments, piping and materials who would be in a position to supply the equipments and pipes based on the design and sizing criteria both international and indigenous and recommend 6 to 8 vendors of repute with lead time for supply of equipments and Machineries.
- xix) Preparation of Detailed technical specifications for surface preparations and painting for civil, mechanical, electrical, piping and instrumentation works.
- xx) Specifications of the quality of laboratory and process chemicals including the suggested dosage for process applications, specifications of the laboratory equipment and the apparatus for routine and specialized investigations including bacteriological quality.
- xxi) Preparation of Layout of the workshop with detailed specifications for maintenance facilities including specifications of the workshop equipment, type and quantity.
- xxii) Recommend necessary performance tests to assess the quality of Product Water and to identify the efficiency of the operating units.
- xxiii) Preparation and providing Operation & Maintenance manual for the Plant(s) including suggesting Operating Procedures and Preventive maintenance schedule.

- xxiv) Preparation of detailed Cost Estimate supported with cost analysis for all the components of selected capacities of containerized Sea Water Reverse Osmosis Desalination Plants, totaling 4 MLD which include the underground storage of product water
- xxv) Consultancy firm has to process the Detailed project report for sanction with assistance of TWAD Board. It has to apprise the project and furnish the required documents necessary for getting approval from the funding agency. The client (TWAD Board) shall accompany the consultant for all discussions with funding agencies within India at their own cost.
- xxvi) Preparation of Detailed Engineering and Technical Specifications and cost estimate for any other system or sub-system that would be required for smooth and uninterrupted operation of the desalination plant.
- xxvii) Any further field data & details necessary for completeness of DPR should be furnished by the Consultants.
- xxviii) The Consultant should also furnish an Activity Chart / PERT Chart indicating the critical activities for monitoring the Project activities.
- xxix) The Consultants should prepare individual Bid Documents for the construction of 4 MLD capacity Containerized Sea Water Reverse Osmosis Desalination Plant, including operation & maintenance of the plant for inviting the bids under International Competitive Bidding (ICB) procedure.

2.4. Economic option

- i. The Power consumption for the plant should be minimum and comparable with best practices of any other Desalination Plant in the world.
- ii. Compile the risks associated with this Project and recommend most appropriate mitigation mechanisms.
- iii. Recommend the most economical option with respect to both Capital and Operation and maintenance for 4 MLD capacity for containerized Sea Water Reverse Osmosis Desalination Plant considering all the above issues.

2.5. Availability of electrical power to the desalination plant

The Tamil Nadu Electricity Board (TNEB) is having power plants in the following locations with sufficient power generation to meet the power demand to the proposed desalination plant.

- i. Valuthur Gas turbine Power Station - 187.2 MW

3.1 Environmental studies

The consultants are expected to undertake a full-fledged Environmental Impact Assessment (EIA) study, including inter alia impact on the marine environment, flora & fauna, social impact etc., The EIA would also examine impact if any on any neighboring habitation / infrastructure / industrial complexes.

The consultants would evaluate the environmental impact of plant during construction / post construction and subsequent operation (including seawater intake/discharge). The recommendations of consultants would need to comply with the Environmental Regulations / Guidelines stipulated by Ministry of Environment and Forests (MoEF), MoU, Government of India, and other Statutory Organizations. Based on studies the consultants would recommend an appropriate and cost effective Environment Management Plan (EMP) including appropriate mitigation measures, Environmental Action Plan (EAP) and Social Management Plan (SMP) for the SWRO plant as may be needed in order to get the statutory clearances.

3.2 Costing

The Consultants would prepare the Detailed Cost Estimate for the construction of 4 MLD capacity of Containerized Sea Water Reverse Osmosis Desalination Plant, Operation & Maintenance of the Plant and all associated works for 5 years.

The consultants have to work out cost of Product water detailing the cost break up.

3.3 Construction and completion time

The consultants should advise the Board on the estimated completion time for the installation of 4 MLD capacity of Containerized Sea Water Reverse Osmosis Desalination Plant which include the underground storage of product water. The Consultants should provide activity Charts/PERT Chart, identifying critical activities for the Project.

3.4 Schedule for completion of task

The duration of the consultancy will be 3months to conduct prefeasibility studies, preparation of Detailed Project Report and Bid documents from the date of signing the agreement. The reports are required according to the following schedule from the date of agreement.

A. Conducting Demand Study, prefeasibility studies, preparation of Detailed Project Report and Bid Documents for the containerized Desalination Plant -3 Months from the date of signing the agreement

Sl. No.	Description	Time duration	Total Days	No. of copies to be furnished
1	Submission of Pre feasibility Report including Environmental feasibility& Financial viability	30days	30 days	10 copies
2	Submission of Interim Report on draft design, drawings and technical specifications for SWRO plant and all associated works with cost estimate	15 days	45 days	15 copies
3	Submission of Draft Detailed Project Report including EIA, Rehabilitation, design & detailed engineering and cost estimates for all the components, O&M Manual, analysis for various options for bidding such as EPC with O&M, DBOT, DFBOT etc ., and draft Bid Documents	15 days	60 days	15 copies
4	Submission of Final Detailed Project Report along with final bid documents	30days	90 days	15 copies

Note : Soft copies of all the reports should be submitted along with the reports

4.1 Responsibilities of the consultants

The Consultants responsibility would include

- i) **Data:** The consultants shall be wholly responsible for all the details of the proposal, the physical and site conditions and execution methodology etc., All data utilized in preparation of the proposal shall be presented indicating sources of the data and also the basis of assumptions if any. The consultants shall be responsible for all the data and/or designs and drawings given by them.
- ii) **Survey and analysis:** The consultants shall conduct independent studies for all the inputs required for the Detailed Project Report and prepare cost estimates which include the underground storage of product water.
- iii) **Soil Investigation and Tests:** Soil test as per Indian Standards (IS)/ Indian Road Congress (IRC) including chemical analysis of sub-soil water have to be conducted by the consultants to arrive at the design parameters for the formation and safe bearing capacity.
- iv) **Instrumentation:** All necessary instrument, equipment and software to carry out the study shall be arranged and operated by the consultants at their own cost.

Project Design: For the given purpose and functional use of the respective projects, proper design has to be developed. The consultants have freedom to choose the type of sub-structure and super structure provided the requirement as per BIS specification / CPHEEO stipulation is met. The drawings and designs shall include a general arrangement drawing and detailed drawings of all components in size A1 or A2
- v) **Estimation of Quantities:** Based on the surveys and designs evolved by the consultants within the framework and the requirements of the projects, the consultants have to prepare detailed item and quantity schedule and subsequently work out the cost estimate for the containerized SWRO plant which includes the underground storage

facilities for the product water and Operation & Maintenance of all works for 5 years.

- vi) **Bid:** Preparation of Bid Documents for setting up of the plant(s) in an appropriate format adopting ICB procedure.

4.2 Services and facilities

- i) Consultants have to make their own arrangement for office accommodation and equipment, software and stationery for the consultancy study. No office accommodation will be provided by TWAD Board for the consultancy study.
- ii) Consultants should note that they are required to make necessary provision for housing their staff and that no assistance in this connection will be provided by TWAD Board.
- iii) The consultants will have to make their own arrangements for necessary computer software and hardware and transportation facilities.

4.3. Final outputs that shall be furnished by the consultants

A. Conducting Demand Study, prefeasibility studies, preparation of Detailed Project Report and Bid documents for the Desalination plant

- i. **Inception Report** : Covering details about site conditions, pre feasibility report including environmental feasibility and approach methodology.
- ii. **Interim Report** :Covering draft design, drawing and technical specifications for the Containerized SWRO plant and all associated works with cost estimate.
- iii. **Detailed Project Report** : Covering Detailed Project Report, Design & Detailed Engineering and cost estimates, and draft Bid documents and EIA along with O&M manual.
- iv. **Final Report** : Final Bid Documents, EIA, CRZ Clearance and DPR with incorporation of necessary comments and corrections given by TWAD Board.

4.4 Procedures for review of progress reports, inception, status, final draft reports

The Progress of the consultancy will be reviewed by a Review Committee once in a month and as and when required if warranted. The reports submitted by the consultants will be scrutinized/ evaluated by the Review Committee and necessary comments on the Inception Report, Interim Report and Detailed Project Report will be furnished to the consultants within 7 days from the date of submission of the report in full. The acceptance of the Final Report will be made by TWAD Board within a reasonable period of 10 (ten) days. In case of Construction management and supervision including third party inspection, the consultant has to make detailed presentations whenever the review meeting convened to review.

I) Review Committee:

The review committee will comprise of the following officials :

- 1 Managing Director, TWAD Board
- 2 Joint Managing Director, TWAD Board
- 3 Finance Director, TWAD Board
- 4 Engineering Director, TWAD Board
- 5 Engineering Director, CMWSS Board
- 6 1 Professor from Indian Institute of Technology, Guindy, Chennai
- 7 Chief Engineer, TWAD Board, Madurai
- 8 Joint Chief Engineer (PDC), TWAD Board
- 9 Joint Chief Engineer (COM), TWAD Board
- 10 Superintending Engineer, TWAD Board, SR cum PM Circle, Sivagangai
- 11 Representative from Directorate of Rural Development and Panchayat Raj.

The observation of the Review Committee will be communicated to the Consultant for incorporation in the Reports.

4.5 Terms of payment

The payment will be made in Indian Rupees. The schedule of payment will be as follows:

A. Conducting prefeasibility studies, preparation of Detailed Project Report and Bid documents

Sl.No.	Schedule	Payment *
1.	On submission and acceptance of Inception Report with a detailed work plan	20% of contract amount
2.	On submission and acceptance of Interim Report	25% of contract amount
3.	On Submission and acceptance of Detailed Project Report and after Technical sanction	25% of contract amount
4.	On submission and acceptance of the Final Report along with Final Bid document and approved by the Board	25% of contract amount

*Upto 95% of the payment will be made to the consultants on submission and acceptance of Final Report. The balance amount of 5% will be retained as Performance Guarantee, which will be paid to the consultants (without interest) after obtaining approval from funding agency/concerned authority for approval of the DPR.

SECTION 6 – STANDARD FORM OF CONTRACT**CONTRACT FOR CONSULTANT’S SERVICES**

between

(name of Client)

and

(name of Consultants)

Dated _____

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I. FORM OF CONTRACT

CONTRACT FOR CONSULTANTS' SERVICES

This CONTRACT Consultancy services to Conduct Prefeasibility studies including Environmental Feasibility, Preparation of Detailed Project Report, Detailed Engineering (including processing for sanction) & Bid Documents for the installation of 4.00 MLD capacity containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years. (hereinafter called the "Contract") is made the-----day of the month of-----, 2019, between, on the one hand **TWAD Board** (herein after called the "Client and on the other hand, -----

(hereinafter called the "Consultants").

WHEREAS

The Client has requested the Consultants to provide certain consulting services as defined in the General Conditions of Contract attached to this Contract (hereinafter called the "Services")

The Consultants, having represented to the Client that they have the required professional skills, personnel and technical resources, have agreed to provide the Services on the terms and conditions set forth in this Contract;

NOW THEREFORE the parties hereto hereby agree as follows;

1. The following documents attached hereto shall be deemed to form an integral part of this Contract
 - a) Information to Consultant
 - b) Data Sheet
 - c) Letter Of Acceptance
 - d) The General Conditions of Contract (hereinafter called "**GCC**");
 - e) The Special Conditions of Contract (hereinafter called "**SCC**");
 - f) Terms of Reference
 - g) Any other documents namely; reply to queries, Clarifications issued by TWAD Board and such information given by the Consultancy Firm which are accepted by the Board and all the Addendum issued are forming part of the Contract.
 - h) The following Appendices

APPENDIX	A	-	Description of the Services
APPENDIX	B	-	Reporting Format
APPENDIX	C	-	Consultant's Key Personnel
APPENDIX	D	-	Review Committee
APPENDIX	E	-	Terms of Payment

2.0 The mutual rights and obligation of the Client and the Consultants shall be as set forth in the Contract; in particular:

- (a) The Consultants shall carry out the Services in accordance with the provisions of the Contract; and
- (b) the Client shall make payments to the Consultants in accordance with the provisions of the Contract.

IN WITNESS WHEREOF, the Parties hereto have caused this Contract to be signed in their respective names as of the day and year first above written.

FOR AND ON BEHALF OF
(NAME OF THE CLIENT)

By _____
(Authorised Representative)

FOR AND ON BEHALF OF
(NAME OF THE CONSULTANTS)

By _____
(Authorised Representative)

II) GENERAL CONDITIONS OF CONTRACT

1. GENERAL PROVISIONS

1.1 Definitions

Unless the context otherwise requires, the following terms whenever used in this Contract have the following meanings:

- (a) "Applicable Law" means the laws and any other instruments having the force of law in the State of Tamil Nadu, India.
- (b) "Contract" means the Contract signed by the Parties, to which these General Conditions of Contract are attached, together with all the documents listed in Clause I of such signed Contract;
- (c) DPR means "Detailed Project Report"
- (d) "Effective Date" means the date on which this Contract comes into force and effect pursuant to Clause GCC 2.1;
- (e) "GCC" means these General Conditions of Contract;
- (f) "Government" means the Government of the Client's country (GOI/GOTN)
- (g) "Currency" means the Indian Rupees
- (h) "Member", in case the Consultants consist of a joint venture of more than one entity, means any of these entities, and "Members" means all of these entities'
- (i) "Personnel" means persons hired by the Consultants as employees and assigned to the performance of the Services or any part thereof;
- (j) "Party" means the Client or the Consultants, as the case may be and Parties means both of them;

- (k) "Services" means the work to be performed by the Consultants pursuant to this Contract for the purpose of the Project, as described in Appendix A hereto;
- (l) "SCC" means the Special Conditions of Contract by which these General conditions of contract may be amended or supplemented;
- (m) "Project": means -Consultancy services to Conduct Demand Study, Prefeasibility studies including Environmental Feasibility, Preparation of Detailed Project Report, Detailed Engineering (including processing for sanction) & Bid Documents for the installation of 4.00 MLD capacity containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years. "Third Party" means any person or entity other than the Government, the Client, the Consultants.

1.2 Relation between the Parties

Nothing contained herein shall be construed as establishing a relation of master and servant or of agent and principal as between the Client and the Consultants. The Consultants, subject to this Contract, have complete charge of Personnel, performing the services and shall be fully responsible for the Services performed by them or on their behalf hereunder.

1.3 Law governing contract

This contract, its meaning and interpretation, and the relation between the Parties shall be governed by the Applicable Law.

1.4 Language

This contract has been executed in the language specified in the SCC, which shall be the binding and controlling language for all matters relating to the meaning or interpretation of this contract.

1.5 Headings

The headings shall not limit, alter or affect the meaning of this contract.

1.6 Notices

1.6.1 Any notice, request or consent required or permitted to be given or made pursuant to this contract shall be in writing. Any such notice, request or consent shall be deemed to have been given or made when delivered in person to an authorized representative of the party to whom the communication is addressed, or when sent by registered mail, or fax / e-mail to such party at the address specified in the SCC.

Notice will be deemed to be effective as follows:

- (a) In the case of personal delivery or registered mail, on delivery;
 - (b) In the case of Fax / e-mail, 72 hours following confirmed transmission
- 1.6.2 A party may change its address for notice hereunder by giving the other party notice of such change pursuant to the provisions listed above in Clause GCC 1.

1.7 Location

The Services shall be performed at such locations as are specified in Appendix A hereto and, where the location of a particular task is not so specified, at such locations, as the Client may approve.

1.8 Authority of member in charge

In case the Consultants consist of a consortium of more than one entity, the Members hereby authorize the entity specified in the SCC to act on their behalf in exercising all the Consultants' rights and obligations towards the Client under this Contract, including without limitation the receiving of instructions and payments from the Client.

1.9 Authorised Representatives

Any action required or permitted to be taken, and any document required or permitted to be executed, under this contract by the Client or the Consultants may be taken or executed by the officials specified in the SCC.

1.10 GST and other taxes

Unless otherwise specified in the SCC, the Consultants and their Personnel shall pay such taxes including the Goods and Service tax, other taxes, fees and other impositions as may be levied under the Applicable Law.

2 COMMENCEMENT, COMPLETION, MODIFICATION AND TERMINATION OF CONTRACT

2.1 Effectiveness of Contract

This contract shall come into force and effect on the date (the "Effective Date") of the Client's notice to the Consultants instructing the Consultants to begin carrying out the services. This notice shall confirm that the effectiveness conditions, if any listed in the SCC have been met.

2.2 Termination of Contract for Failure to Become Effective

If this contract has not become effective within the time prescribed below (2.3 of GCC) then the Client may, by not less than two (2) weeks' written notice to the Consultant declare this contract to be null and void and in the event of such declaration by the Client, the Consultant shall have no claim against the Client with respect hereto.

2.3 Commencement of Services

The Consultants shall begin carrying out the Services from the date of execution of agreement

2.4 Expiration of Contract

Unless terminated earlier pursuant to Clause 2.9 hereof, this contract shall expire when services have been completed and all payments have been made.

2.5 Entire Agreement

This contract contains all covenants, stipulations and provisions agreed by the parties. No Agent or representative of either Party has authority to make, and the Parties shall not be bound by or be liable for, any statement, representation, promise or agreement not set forth herein.

2.6 Modification

Modification of the terms and conditions of this contract, including any modification of the scope of the Services, may only be made by written agreement between the Parties and shall not be effective otherwise. Pursuant to Clause 7.2 hereof, however, each party shall give due consideration to any proposals for modification made by the other Party.

2.7 Force Majeure

2.7.1 Definition

2.7.1.1 The works taken by the contractors under the contract shall be at the contractor's risk until the work is taken over by the Executive Engineer. The contractor shall arrange his own insurance against fire, flood, volcanic eruption, earth quake and other convulsions of nature and all other natural calamities, risks arising out of acts of God, Acts of Terrorism, Civil disturbances, Riots during such period and that the TWAD Board

/Government shall not be liable for any loss or damages occasioned by or arising out of any such acts of God.

- 2.7.1.2 Provided however that the contractor shall not be liable for all or any loss or damages occasioned by or arising out of acts of foreign enemies, invasion, hostilities or war like operations (before or after declaration of war) rebellion military or usurped power

2.7.2.No Breach of Contract

The failure of a party to fulfill any of its obligations hereunder shall not be considered to be a breach, or default under, this Contract insofar as such inability arises from an event of Force Majeure provided that the party affected by such an event has taken all reasonable precautions, due care and reasonable alternative measures, all with the objective of carrying out the terms and conditions of this Contract.

2.7.3.Measures to be Taken

- (a) A Party affected by an event of Force Majeure shall take all reasonable measures to remove such Party's inability to fulfill its obligations hereunder with a minimum of delay.
- (b) A Party affected by an event of Force Majeure shall notify the other Party of such event as soon as possible, and in any event not later than fourteen (14) days following the occurrence of such event, providing evidence of the nature and cause of such event, and shall similarly give notice of the restoration of normal conditions as soon as possible.
- (c) The parties shall take all reasonable measures to minimize the consequences of any event of Force Majeure.

2.7.4.Extension of Time

Any period within which a Party shall, pursuant to this contract, complete any action or task, shall be extended for a period equal to the time during which such Party was unable to perform such action as result of Force Majeure.

2.7.5 Payments

During the period of their inability to perform the Services as a result of an event of Force Majeure, the Consultants shall be entitled to be reimbursed for additional costs reasonably and necessarily incurred by them during such period for the purposes of the Services and in reactivating the Services after the end of such period.

2.7.6 Consultation

Not later than thirty (30) days after the Consultants, as the result of an event of Force Majeure, have become unable to perform a material portion of the Services, the Parties shall consult with each other with a view to agreeing on appropriate measures to be taken in the circumstances.

2.8 Suspension

The Client may, by written notice of suspension to the Consultants, suspend all payments to the Consultants hereunder (i) if the Consultants fail to perform any of their obligations under this Contract, including the carrying out of the Services, provided that such notice of suspension shall specify the nature of the failure and (ii) shall request the Consultants to remedy such failure within a period not exceeding thirty (30) days after receipt by the Consultants of such notice of suspension.

2.9 Termination

2.9.1 By the Client

The Client may, by not less than Fifteen (15) days and written notice of termination to the Consultants (except in the event listed in paragraph (f) below, for which there shall be a written notice of not less than Thirty (30) days), such notice to be given after the occurrence of any of the events specified in paragraphs (a) through (g) of this Clause 2.9.1 terminate this contract:

- (a) if the Consultants fail to remedy a failure in the performance of their obligations hereunder, as specified in a notice of suspension pursuant to Clause 2.8 herein above, within Fifteen (15) days of receipt of such notice of suspension or within such further period as the Client may have subsequently approved in writing;
- (b) if the Consultants become (or, if the, Consultants consist of more than one entity, if any of their Members becomes) insolvent or bankrupt or enter into any agreements with their creditors for relief of debt or take advantage of any law for the benefit of debtors or go into liquidation or receivership whether compulsory or voluntary;
- (c) if the Consultants fail to comply with any final decision reached as a result of arbitration proceedings pursuant to Clause 8 hereof;
- (d) if the Consultants submit to the Client a statement which has a material effect on the rights, obligations or interests of the Client and which the Consultants know to be false;
- (e) if, as the result of Force Majeure, the Consultants are unable to perform a material portion of the Services for a period of not less than Thirty (30) days; or
- (f) if the Client, in its sole discretion and for any reason whatsoever, decides to terminate this Contract.

- (g) if the Consultant, in the judgment of the Client has engaged in corrupt or fraudulent practices in competing or in executing the Contract. For the purpose of this Clause:

“corrupt practice” means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the selection process or in contract execution.

“fraudulent practice” means a misrepresentation of facts in order to influence a selection process or the execution of a contract to the detriment of the Clients, and includes collusive practice among Consultants (prior to or after submission of proposals) designed to establish prices at artificial non-competitive levels and to deprive the Clients of the benefits of free and open compensation.

2.9.2 Cessation of Rights and Obligations

Upon termination of this contract pursuant to Clause 2.2. or 2.9 hereof, or upon expiration of this contract pursuant to Clause 2.4 hereof, all rights and obligations of the Parties hereunder shall cease, except:

such rights and obligations as may have accrued on the date of termination or expiration

(ii) the obligation of confidentiality set forth in Clause 3.3 hereof;

(iii) the Consultants’ obligation to permit inspection, copying and auditing of their accounts and records set forth in Clause 3.6 (ii) hereof; and

(iv) any right which a Party may have under the Applicable Law.

2.9.3 Cessation of Services

Upon termination of this contract by notice pursuant to Clauses 2.9.1 hereof, the consultants shall, immediately upon receipt of such notice, take all necessary steps to bring the Services to a close in a prompt and orderly manner and shall make every reasonable effort to keep expenditures for this purpose to a minimum. With respect to documents prepared by the Consultants and equipment and materials furnished by the Client, the Consultants shall proceed as provided, respectively, by clauses 3.9 or 3.10 hereof.

2.9.4 Payment upon Termination

Upon termination of this contract pursuant to Clauses 2.9.1 hereof, the Client shall make the following payments to the Consultants (after offsetting against these payments any amount that may be due from the Consultant to the Client).

- (a) remuneration pursuant to Clause 6 hereof for Services satisfactorily performed prior to the effective date of termination
- (b) reimbursable expenditures pursuant to Clause 6 hereof for expenditure actually incurred prior to the effective date of termination; and
- (c) except in the case of termination pursuant to paragraphs (a) through (d) of Clause 2.9.1 hereof, reimbursement of any reasonable cost incident to the prompt and orderly termination of the Contract.

2.9.5 Disputes about Events of Termination

If the Consultant disputes whether an event specified in paragraphs (a) through (e) of Clause 2.9.1 hereof has occurred, then the Consultant, may within Thirty (30) days after receipt of notice of termination from the Client, refer the matter to arbitration pursuant to Clause 8 hereof, and this Contract shall not be terminated on account of such event except in accordance with the terms of any resulting arbitral award.

3. OBLIGATIONS OF THE CONSULTANTS

3.1 General

3.1.1 Standard of Performance

The Consultants shall perform the Services and carry out their obligations hereunder with all due diligence, efficiency and economy, in accordance with generally accepted professional techniques and practices and shall observe sound management practices, and employ appropriate advanced technology and safe and effective equipment, machinery, materials and methods. The Consultants shall always act, in respect of any matter relating to this Contract or to the Services, as faithful advisers to the Client, and shall at all times support and safeguard the Client's legitimate interests in any dealings with Third Parties.

3.1.2 Law Governing Services

The Consultants shall perform the Services in accordance with the Applicable Law and shall take all practicable steps to ensure that the Personnel of the Consultants comply with the Applicable Law. The Consultants shall be conversant with laws / local customs and respect them.

3.2 Conflict of Interests

3.2.1 Consultants Not to Benefit from Commissions, Discounts, etc.

The remuneration of the Consultants pursuant to Clause 6 hereof shall constitute the Consultants' sole remuneration in connection with this Contract for the Services and, subject to Clause 3.2.2. hereof, the Consultant shall not accept for their own benefit any trade commission, discount or similar payment in connection with activities pursuant to this Contract or to the Services or in the discharge of their obligations hereunder, and the Consultants shall use their best efforts to ensure that their Personnel similarly shall not receive any such additional remuneration.

3.2.2 Procurement Rules of Funding Agencies

If the Consultants, as part of the Services, have the responsibility of advising the Client on the procurement of goods, works or services, the Consultants shall comply with any applicable procurement guidelines of funding agencies and shall at all times exercise such responsibility in the best interest of the Client. Any discounts or commissions obtained by the Consultants in the exercise of such procurement responsibility shall be for the account of the Client.

3.2.3 Consultants and Affiliates Not to engage in Certain Activities

The Consultants agree that, during the term of this Contract and after its termination, the Consultants and any entity affiliated with the Consultants shall be disqualified from providing goods, works or services (other than the Services and any continuation thereof) for any project resulting from or closely related to the Services subject to the provision in the Special Condition of Contract.

3.2.4 Prohibition of Conflicting Activities

The Consultants shall not engage, and shall cause their Personnel as well as their personnel not to engage, either directly or indirectly, in any of the following activities.

- (a) during the term of this Contract, any business or professional activities in the Government's country which would conflict with the activities assigned to them under this Contract; and
- (b) For a period of two years after the expiration of this Contract, the Consultants shall not engage, and shall cause their Personnel not to engage, in the activity of a purchaser (directly or indirectly) of the assets on which they advised the Client under this Contract nor in the activity of an adviser (directly or indirectly) of potential purchasers of such assets. The Consultants also agree that their affiliates shall be disqualified for the same period of time from engaging in the said activities.

3.3 Confidentiality

The Consultants, their personnel shall not, either during the term or after the expiration of this Contract, disclose any proprietary or confidential information relating to the Project, the Service, this contract or the Client's business or operations without the prior written consent of the Client.

3.4 Liability of the Consultants

The Consultants shall be liable to the Clients for the performance of the services in accordance with the provision of this contract and for any loss suffered by the Client as a result of default of the Consultants in such performance.

The Client shall be indemnified by the Consultants for any damage to Third Parties caused by the Consultants or any person or firm acting on behalf of the Consultants in carrying out the services.

The Consultant will be levied liquidated damages for non compliance with respect to engaging key personnel or for the absence of key personnel for continuous period of 7 days and above double the monthly wages proposed till the personnel returns to duty.

The successful consultant is required to furnish the Performance Security in the form of irrevocable bank guarantee as specified in the Special Conditions of Contract.

If the consultants terminate the contract in between any of the activities or do not carry out any one of the activities, then the Performance Security furnished by the consultants shall be forfeited.

3.5 Insurance to be taken out by the Consultants

The Consultants (a) shall take out and maintain at their own cost by on terms and conditions approved by the Client, insurance against the risks, and

for the coverage, as shall be specified in the SCC; and (b) at the Client's request, shall provide evidence to the Client showing that such insurance has been taken out and maintained and that the current premiums have been paid.

The minimum insurance cover for loss or damage to the equipment and physical property in connection with this contract, personal injury or death, the insurance valid for 4 occurrences always is Rs. 10,000/- per occurrence, with the number of occurrences limited to 4. After each occurrence, the Consultant will pay additional premium necessary to make insurance valid for 4 occurrences always.

3.6 Accounting, Inspection and Auditing

The Consultants (i) shall keep accurate and systematic accounts and records in respect of the Services hereunder, in accordance with internationally accepted accounting principles and in such form and detailed as will clearly identify all relevant time charges and cost, and the bases thereof; (ii) shall permit the Client or its designated representative periodically, and up to one year from the expiration or termination of this Contract, to make copies thereof.

3.7 Consultants' Actions Requiring Client's Prior Approval

The Consultants shall obtain the Client's prior approval in writing before taking any of the following actions:

- (a) Appointing such members of the Personnel as are listed in Appendix C ("Consultants' Key Personnel") merely by title but not by name;
- (b) Outsourcing for the performance of any part of the Services and the Consultants shall remain fully liable for the performance of the Services by the outsourcing firm and its Personnel pursuant to this contract; and
- (c) Any other action that may be specified in the SCC.

3.8 Reporting Obligations

The Consultants shall submit to the Client the reports and documents specified in Appendix B hereto in the form in the numbers and within the time periods set forth in the said Appendix B

3.9 Documents Prepared by the Consultants to be the Property of the Client

All plans, drawings, specifications, designs, reports and other documents and software prepared by the Consultants for the Client under this Contract and in performing the Services shall become and remain the property of the Client, and the Consultants shall, not later than Fifteen (15) days upon termination or expiration of this contract, deliver all such documents to the Client, together with a detailed inventory thereof. The Consultants shall not use these documents for any other purpose without the prior approval of the Client.

3.10 Equipment and Materials Furnished by the Client

Equipment and materials made available to the Consultants by the Client, or purchased by the Consultants with funds provided by the Client, shall be the property of the Client and shall be marked accordingly. Upon termination or expiration of this contract, the Consultants shall make available to the Client an inventory of such equipment and materials and shall return such equipment and materials to Client not later than Fifteen (15) days. While in possession of such equipment and materials, the Consultants, unless otherwise instructed by the Client in writing, shall insure them at the expense of the Client in an amount equal to their full replacement value.

4 CONSULTANTS' PERSONNEL

4.1 General

The Consultants shall employ and provide such qualified and experienced Personnel as are required to carry out the Services.

4.2 Description of Personnel

- (a) The titles, agreed job descriptions, minimum qualifications and estimated periods of engagement in the carrying out of the Services of each of the Consultants' Key Personnel are described in Appendix C. The Key Personnel listed by title as well as by name in Appendix C are hereby approved by the Client.
- (b) If required to comply with the provisions of Clause 3.1.1 hereof this Contract, adjustments with respect to the estimated periods of engagement of Key Personnel set forth in Appendix C may be made by the Consultants by written notice to the Client, provided (i) that such adjustments shall not alter the originally estimated period of engagement of any individual by more than 10% or one week, whichever is larger, and (ii) that the aggregate of such adjustments shall not cause payments under this contract. Any other such adjustments shall only be made with the Client's written approval.
- (c) If additional work is required beyond the scope of the Services specified in Appendix A, the estimated periods of engagement of Key Personnel set forth in Appendix C may be increased by agreement in writing between the Client and the Consultants.

4.3 Approval of Personnel

The Key Personnel listed by title as well as by name in Appendix C, which the Consultants propose to use in the carrying out of the Service, shall be submitted to the Client for review and approval.

4.4 Working hours, Overtime, Leave etc.

The key Personnel shall not be entitled to be paid for overtime nor to be paid for sick leave or vacation leave. The Consultants' remuneration shall be deemed to cover these items. All leave to be allowed to the Personnel, is

included in the staff-months of service set forth in Appendix C. Any taking of leave by Personnel shall be subject to the prior approval by the Consultants who shall ensure that absence for leave purposes will not delay the progress and adequate supervision of the Services.

4.5 Removal and/or Replacement of Personnel

- (a) Except as the Client may otherwise agree no changes shall be made in the Key Personnel. If, for any reason beyond the reasonable control of the Client / Consultants, it becomes necessary to replace any of the Personnel, the Consultants shall forthwith provide as a replacement a person of equivalent or better qualification and experience.
- (b) If the Client (i) finds that any of the Personnel has committed serious misconduct or has been charged with having committed a criminal action, or (ii) has reasonable cause to be dissatisfied with the performance of any of the Personnel, then the Consultants shall, at the Client's written request specifying the grounds therefore, forthwith provide as a replacement a person of equivalent or better qualifications and experience.
- (c) Each member of the staff appointed by the Consultants shall be under probation for a period of 1 month. If his performance is found to be not satisfactory within this period, the Client shall have the right to ask for replacement of such person at the Consultants' cost and the Consultants will not be entitled to recover any cost on account of the Service of this person during the probation period.

5.0 OBLIGATIONS OF THE CLIENT

5.1 Assistance and Exemptions

Unless otherwise specified in the SCC, the Client shall use its best efforts to ensure that the Government shall;

- (a) Provide the Consultants and their Personnel with work permits and such other documents as shall be necessary to enable the Consultants and their Personnel to perform the Services;
- (b) Issue to officials, agents and representatives of the Government all such instructions as may be necessary or appropriate for the prompt and effective implementation of the Services;
- (c) Provide to the Consultants and their Personnel any such other assistance as may be specified in the SCC.

5.2 Access to Land

The Client warrants that the Consultants shall have, free of charge, unimpeded access to all land in respect of which access is required for the performance of the Services.

5.3 Change in the Applicable Law

If, after the date of this Contract, there is any change in the Applicable Law with respect to taxes and duties, which increases or decreases the cost or reimbursable expenses incurred by the Consultants in performing the Services, then the remuneration and reimbursable expenses otherwise payable to the Consultants under this Contract shall be increased or decreased accordingly by agreement between the parties hereto and corresponding adjustments shall be made to the ceiling amounts specified in Clause 6.

5.4 Payment

In consideration of the Services performed by the Consultants under this contract, the Client shall make to the Consultants such payments and in such manner as is provided by Clause 6 of this Contract.

6. PAYMENTS TO THE CONSULTANTS

6.1. Lump Sum Remuneration

The Consultant's total remuneration shall not exceed the Contract Price and shall be a fixed lump sum, including all staff costs, printing, communications, travel, accommodation, and the like, and all other costs incurred by the Consultant in carrying out the Services described in Appendix A. Except as provided in clause 5.3 the contract price may only be increased if the parties have agreed to additional payments in accordance with the clause 2.6

The payment to the expatriate consultants will be made in Indian Rupees.

6.2. Currency of Payment

The Client shall pay to the Consultants in local currency (Indian Rupees) as quoted by the consultants as remuneration.

6.3 Mode of Billing and Payment

Billings and payments in respect of the Services shall be made as follows:

- (a) All payments under this Contract shall be made to the account of the Consultants specified in the SCC.

7. FAIRNESS AND GOOD FAITH

7.1 Good Faith

The Parties undertake to act in good faith with respect to each other's rights under this Contract and to adopt all reasonable measures to ensure the realization of the objectives of this Contract.

7.2 Operation of the Contract

The Parties recognize that it is impractical in this contract to provide for every contingency which may arise during the life of the contract, and the parties hereby agree that it is their intention that this contract shall operate

fairly as between them, and without detriment to the interest of either of them, and that, if during the term of this contract either Party believes that this contract is operating unfairly, the Parties will use their best efforts to agree on such action as may be necessary to remove the cause or causes of such unfairness but no failure to agree on any action pursuant to this Clause shall give rise to dispute subject to arbitration in accordance with Clause 8 hereof.

8 SETTLEMENT OF DISPUTES

8.1 Disputes Redressal Committee

In order to ensure a dispute Redressal mechanism, a Committee headed by the Managing Director/ Joint Managing Director and consisting of Engineering Director, TWAD Board and Engineering Director , CMWSS Board as Member, will comprise the "Disputes Redressal Committee" for each package in order to resolve any disputes between the client /Engineer – in charge concerned and the consultants

8.2. Jurisdiction of Court

In the event of non settlement of any dispute by the Disputes Redressal Committee arising between the parties hereto in respect of any matter comprised in the contract the same shall be settled at a competent court having jurisdiction over the place where the contract is awarded and agreement is concluded and by no other court .

III. SPECIAL CONDITIONS OF CONTRACT

Number of GCC Clause

A. AMENDMENT OF, AND SUPPLEMENTS TO, CLAUSES IN THE GENERAL CONDITIONS

1.4 Language is : English

1.6.1 The addresses are
Client : Tamil Nadu Water Supply and Drainage Board .

Attention : Chief Engineer

Telephone : +91 452 2585339

Fax : + 91 452 2584595

E – Mail : cesrtwad@gmail.com

web site : www.twadboard.tn.gov.in

Consultants

Attention :

Telephone :

Fax :

E-Mail :

Web-site :

1.8 The Authorized Representatives are:

For the Client : Chief Engineer or his designated representative

For the Consultant: -----

1.9.1 The Consultants and the Personnel shall pay the taxes including the Service tax, duties, fees, levies and other impositions levied under the existing, amended or enacted laws during life of this contract and the Client shall perform such duties in regard to the deduction of such tax as may be lawfully imposed.

Consultants may appoint a tax consultant at their own cost to deal with the matters of Income tax for the Consultants and their staff.

The Consultants shall seek the information necessary to allow them to calculate their approximate liability for the applicable taxes, duties and impositions from Indian Income Tax Consultants.

- 2.1 The date on which this Contract shall come into effect is the date of agreement which is to be executed within 15 days from the date of receipt of Letter of Acceptance after furnishing the required performance certificate.
- 2.3 The date for commencement of services is from the date of execution of agreement.
- 2.4 The period of consultancy shall be **3 months** from the effective date as indicated in ToR.
- 2.8. The Consultants shall not use these documents for purposes unrelated to the Contract without the prior written approval of the Client.
- 2.9 The successful consultant shall furnish an irrevocable bank guarantee equal to 2% of the Consultancy contract value drawn from any of the Scheduled / Nationalised Bank before signing the agreement which shall be valid up to one year from the date of completion of consultancy contract in conformity with the conditions laid down in Section 2 (6.1 Award of Contract).
- 3.0. The risks and the coverage shall be
 - 1) Third party motor vehicle liability insurance as required under Motor Vehicles Act, 1988, in respect of motor vehicles operated in India by Consultants or their Personnel, for the period of Consultancy;
 - 2) Third party liability insurance, with a minimum coverage for Rs.1,00,000/- for the period of Consultancy;

3)Employer's liability and workers' compensation insurance in respect of the Personnel of the Consultant, in accordance with the relevant provisions of the Applicable Law, as well as, with respect to such Personnel, any such life, health, accident, travel or other insurance as may be appropriate;

4)Professional liability insurance, with a minimum coverage of equal to total contract value for this consultancy; and

5)Insurance against loss of or damage to (i) equipment purchased in whole or in part with funds provided under this Contract, ii) the Consultants' property used in the performance of the Services, and (iii) any documents prepared by the Consultants in the performance of the Services.

4.0 The Contract Price is Rs.

Any variation in GST imposition of new taxes shall be adjusted and paid by TWAD Board in accordance with Clause:5.3 of GCC.

4.1The details of account for the payment

Account Number :

Type of Account :

Name & Address of

the Bank (Branch) :

A) The payment to the expatriate consultants will be made in Indian Rupees.

4.2.1 The schedule of payment will be as follows:

A. Preparation of Prefeasibility Report, Detailed Project Report(Processing for sanction) and Bid documents

Sl. No.	Schedule	Payment
1.	On submission and acceptance of Inception Report with a detailed work plan	20% of contract amount
2.	On submission and acceptance of Interim Report	25% of contract amount
3.	On Submission and acceptance of Detailed Project Report and after Technical sanction	25% of contract amount
4.	On submission and acceptance of the Final Report along with Final Bid document and approved by the Board	25% of contract amount

C) Performance Guarantee:

95% of the payment will be made to the consultants on submission and acceptance of Final Report. The balance amount of 5% will be retained as Performance Guarantee, which will be paid to the consultants (without interest) after obtaining approval from Funding agency/concerned authorities for the DPR.

IV. APPENDICES

APPENDIX A - DESCRIPTION OF THE SERVICES

1. SCOPE OF WORK

The scope of work under this consultancy is to Conduct demand study, Prefeasibility studies including environmental feasibility, for setting up of 4.0 MLD capacity containerized SWRO Preparation of Detailed Project Report (including processing for sanction), Detailed Engineering & Bid Documents for the 4 MLD capacity for the installation of containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years.

2. OBJECTIVE OF THE ASSIGNMENT

The objective of this Consultancy to conduct Demand Study, Prefeasibility studies including environmental feasibility, for setting up of 4.0 MLD capacity containerized SWRO Preparation of Detailed Project Report (including processing for sanction), Detailed Engineering & Bid Documents for the installation of 4 MLD capacity containerized Sea Water Reverse Osmosis Desalination Plant at Narippaiyur in Ramanathapuram District, Tamil Nadu, India including the O&M of the plant and allied units for 5 years.

3. OUTLINE OF THE TASKS TO BE CARRIED OUT:

3.1. DATA COLLECTION

i) The Consultants have to collect basic data in respect of the location for installation of the Plant, such as Data on Sea Water / Intake Water covering quality of sea water, Indicative temperature, salinity and seasonal variations, data required for raw water intake system designs and reject disposal system design (Bathymetric Studies) and strategy for optimizing quality of Intake water based on site conditions and the details of High Tide Line (HTL) and Low Tide Line (LTL).

ii) Consultants should consider various issues related to the Capital and O&M cost including power consumption in order to optimise the project life cycle cost.

iii) Consultant have to identify the location for tapping the required power to the proposed plant from the Tamil Nadu Electricity Board (TNEB) power grid.

3.2. DEVELOPMENT OF DESIGN AND DETAILED TECHNICAL SPECIFICATIONS FOR THE PROPOSED DESALINATION PLANT:

The consultants shall develop the detailed design and detailed technical specifications for 4 MLD capacity Containerized Sea Water Reverse Osmosis Desalination plant suitable to the site condition.

This will broadly comprise of but not restricted to;

- i. Topographic Survey of the site and preparation of topo – drawings.
- ii. Soil Investigation Report, seismic, rainfall, wind and temperature.
- iii. Design, Detailed Engineering and Specifications for process units, piping and allied utilities of the Plant.
- iv. Design, drawing and Detailed Technical specifications for the sea water intake system.
- v. Design drawing and Detailed Technical specifications for the Reject disposal system.
- vi. Plant layout, Pipeline and Instrumentation Diagrams (P&I ds) and Hydraulic Profile
- vii. Detailed Design, drawings and Detailed Technical Specifications for all mechanical equipments and off site piping valves and fittings.
- viii. Detailed Design and Detailed Technical Specifications for all Electrical Equipments and Single Line Diagram (SLD).
- ix. Detailed Design and Detailed Technical Specifications for Instrumentation equipment, Instrumentation control Philosophy and Instrumentation Schematics with drawings.
- x. Detailed Engineering and Specifications for the sustained feed water quality.
- xi. Detailed Engineering and Specifications for the Product Water quality confirming to drinking water standard as per IS 10500-1991 and as amended from time to time and flow.

- xii. Detailed Engineering for minimisation of water losses in process operations.
- xiii. Assessment of power requirement for the plant, detailed design and drawings for electrical sub-station and preparation of Yard drawing including distribution arrangements to the process units, lighting etc.
- xiv. Identify the location for tapping the required power to the proposed plant from the Tamil Nadu Electricity Board (TNEB) power grid.
- xv. Detailed Design, drawings and Technical Specifications for buildings and all other civil structures.
- xvi. Detailed Design, drawings and specifications for in-plant roads, drainage, utilities and landscaping.
- xvii. Detailed Technical specifications for all construction materials, construction methodology and stage wise test to be carried out prior to acceptance.
- xviii. Survey of the possible suppliers of the equipments, piping and materials who would be in a position to supply the equipments and pipes based on the design and sizing criteria both international and indigenous and recommend 6 to 8 vendors of repute with lead time for supply of equipments and materials.
- xix. Detailed technical specifications for surface preparations and painting for civil, mechanical, electrical, piping and instrumentation works.
- xx. Specifications of the quality of laboratory and process chemicals including the suggested dosage for process applications, specifications

of the laboratory equipment and the apparatus for routine and specialized investigations including bacteriological quality.

- xxi. Layout of the workshop with detailed specifications for maintenance facilities including specifications of the workshop equipment, type and quantity.
- xxii. Recommend necessary performance tests to assess the quality of Product Water and to identify the efficiency of the operating units.
- xxiii. Preparation of detailed Cost Estimate supported with cost analysis for all the components of 4 MLD capacity Containerized Sea Water Reverse Osmosis Desalination plant.
- xxiv. Assist the TWAD Board in furnishing the required documents for getting necessary approval from Funding agency/concerned authority for approval of the DPR.
- xxv. Detailed Engineering and Technical Specifications and cost estimate for any other system or sub-system that would be required for smooth and uninterrupted operation of the desalination plant.
- xxvi. Any further field data & details necessary for completion of DPR should be furnished by the Consultants.
- xxvii. The Consultant should also furnish an Activity Chart / PERT Chart indicating the critical activities for monitoring the Project activities.
- xxviii. The consultants should prepare the Bid documents for 4 MLD capacity Containerized Sea Water Reverse Osmosis Desalination plant to invite International Competitive Bidding (ICB) including operation & maintenance of the plant.

3.3 ECONOMIC OPTION

- i) The Power consumption for the plant should be minimum and comparable with best practices of any other plant in the world.
- ii) Compile the risks associated with this Project and recommend most appropriate mitigation mechanisms.
- iii) Recommend the most economical option for 4 MLD capacity Containerized Sea Water Reverse Osmosis Desalination plant suitable to the site condition considering all the above issues.

3.4 ENVIRONMENTAL STUDIES:

The consultants are expected to undertake a full fledged Environmental Impact Assessment (EIA) study, including inter alia impact on the marine environment, flora & fauna, social impact and CRZ Clearance etc.. The EIA would also examine impact if any on any neighboring habitation / infrastructure / industrial complexes.

The consultants would evaluate the environmental impact of plant during construction / post construction and subsequent operation (including seawater intake/discharge). The recommendations of consultants would need to comply with the Environmental Regulations / Guidelines stipulated by Ministry of Environment and Forests(MOEF), Government of India, and other Statutory Organizations. Based on studies the consultants would recommend an appropriate and cost effective Environment Management Plan (EMP) including appropriate mitigation measures, Environmental Action Plan (EAP) and Social Management Plan (SMP) for the SWRO plant as may be needed in order to get the statutory clearances.

3.5 COSTING:

The Consultants would prepare the Detailed Cost Estimate for Construction and Operation & Maintenance of 4 MLD capacity Containerized Sea Water Reverse Osmosis Desalination plant and all associated works for a period of 5 years.

The consultants have to work out cost of Product water detailing the cost break up.

3.6 CONSTRUCTION AND COMPLETION TIME

A) The consultants should advise the Board on the estimated completion time for construction of 4 MLD capacity Containerized Sea Water Reverse Osmosis Desalination plant and to provide specific recommendation on the phasing of the project. The Consultants should provide activity Charts/PERT Chart, identifying critical activities for the Project.

8. SERVICES AND FACILITIES :

- i) Consultants have to make their own arrangement for office accommodation and equipment, software and stationery for the consultancy study. No office accommodation will be provided by TWAD Board for the consultancy study.
- ii) Consultants should note that they are required to make necessary provision for housing their staff and that no assistance in this connection will be provided by TWAD Board
- iii) The consultants will have to make their own arrangements for necessary computer software and hardware and transportation facilities.

9. TOTAL KEY PROFESSIONAL STAFF'S ESTIMATED MANMONTHS

A) For conducting prefeasibility studies,
preparation of Detailed Project Report
and Bid document

- 25 **man months.**

10. FINAL OUTPUTS THAT SHALL BE FURNISHED BY THE CONSULTANTS :**A. Conducting Demand study ,prefeasibility studies, preparation of Detailed Project Report and Bid documents**

- i) **Inception Report:** Covering details about site conditions, Demand, pre feasibility report including environmental feasibility and approach methodology.
- ii) **Interim Report :** Covering draft design, drawing and technical specifications for the SWRO plant and all associated works with cost estimate.
- iii) **Detailed Project Report :** Covering Detailed Project Report, Design & Detailed Engineering and cost estimates, and draft Bid documents and EIA.
- iv) **Final Report :** Final Bid Documents, EIA, CRZ Clearance and DPR with incorporation of necessary comments and corrections given by TWAD Board.

APPENDIX B - REPORTING FORMAT

A. Conducting Demand Study, prefeasibility studies, preparation of Detailed Project Report and Bid Documents for the Containerized Desalination Plant- 3 Months from the date of signing the agreement

Sl.No.	Schedule	Time Duration	No. of copies
1.	Submission of Pre feasibility Report including Environmental feasibility & Financial viability	30 days	10
2	Submission of Interim Report on draft design, drawings and technical specifications for SWRO plant and all associated works with cost estimate	15 days	15
3	Submission of Draft Detailed Project Report including EIA, Rehabilitation, design & detailed engineering and cost estimates for all the components, O&M Manual, analysis for various options for bidding such as EPC with O&M, DBOT, DFBOT etc., and draft Bid Documents	15 days	15
4	Submission of Final Detailed Project Report along with final bid documents	30 days	15

Miscellaneous

- a) Consultant has to make his own arrangements for office accommodation transport communications and equipment for the consultancy study. No office accommodation will be provided by TWAD Board for the consultancy study.
- b) Consultants should note that they are required to make necessary provision for housing their staff and that no assistance in this connection will be provided by TWAD Board.
- c) The consultants will have to make their own arrangements for necessary computer software and hardware and transportation facilities.

Note : Soft copies of all the reports should be submitted along with the reports

APPENDIX C - CONSULTANTS'**KEY PERSONNEL**

- List under: C-1 Titles and names, detailed job descriptions and minimum qualifications to be assigned to work and staff-months for each
- C-2 Same information as C-1 for Key local personnel / expatriate personnel (if required).

APPENDIX D - REVIEW COMMITTEE

The Progress of the consultancy will be reviewed by a Committee once in a month and as and when required if warranted. The reports submitted by the consultants will be scrutinized/evaluated by the Committee and necessary comments/approval on the report will be furnished to the consultants within 15 days from the date of submission of the report in full.

I. Review Committee:

The review committee will comprise of the following officials of TWAD Board.

- 1 Managing Director, TWAD Board
- 2 Joint Managing Director, TWAD Board
- 3 Finance Director, TWAD Board
- 4 Engineering Director, TWAD Board
- 5 Engineering Director, CMWSS Board
- 6 1 Professor from Indian Institute of Technology, Guindy, Chennai
- 7 Chief Engineer, TWAD Board, Madurai
- 8 Joint Chief Engineer (PDC), TWAD Board
- 9 Joint Chief Engineer (COM), TWAD Board
- 10 Superintending Engineer, TWAD Board, SR cum PM Circle, Sivagangai
- 11 Representative from Directorate of Rural Development and Panchayat Raj.

The observation of the Review Committee will be communicated to the Consultant for incorporation in the Reports.

The Chief Consultant shall attend the periodical Review Meeting conducted by the Client with the required progress details.

APPENDIX E - TERMS OF PAYMENT**Terms of payment –Refer Clause 6-4 GCC**

Performance Guarantee:

95% of the payment will be made to the consultants on submission and acceptance of Final Report. The balance amount of 5% will be retained as Performance Guarantee, which will be paid to the consultants (without interest) after obtaining approval from Funding agency/concerned authorities for the approval of the DPR.

APPENDIX - F
PERFORMANCE BANK GUARANTEE

To: _____ *[name of Employer]*
_____ *[address of Employer]*

WHEREAS _____ *[name and address of Contractor]*
(hereinafter called "the Contractor") has undertaken, in pursuance of Contract No. _____ dated _____ to execute _____ *[name of Contract and brief description of Works]* (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of _____ *[amount of guarantee]*¹ _____ *[in words]*, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ *[amount of guarantee]*¹ as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until one year from the date of completion of the Consultancy Contract.

Signature and seal of the guarantor _____

Name of Bank _____

Address _____

Date _____

An amount shall be inserted by the Guarantor, representing the percentage of the Contract Price specified in the Contract including additional security for unbalanced Bids, if any and denominated in Indian Rupees.

ANNEXURE.I.**BID SECURITY (BANK GUARANTEE)**

WHEREAS,(Name of Bidder) (herein after called "the Bidder") has submitted his Bid dated. (Date) for the construction of(Name of Contract) (hereinafter called 'the Bid).

KNOW ALL PEOPLE by these presents that We(Name of bank) ofhaving our registered office at(hereinafter called "the Bank") are bound unto(name of Employer) (hereinafter called "the Employer") in the sum of(1) for which payment well and truly to be made to the said Employer the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank thisday of2019.

THE CONDITIOINS of this obligation are:

(1) If after Bid opening the Bidder withdraws his bid during the period of Bid validity specified in the Form of Bid:

or

(2) If the Bidder having been notified of the acceptance of his bid by the Employer during the period of bid validity.

(a) fails or refuses to execute the Form of Agreement in accordance with the instructions to Bidders, if required: or

(b) fails or refuses to furnish the Performance Security, in accordance with the instruction to Bidders or

(c) does not accept the correction of the Bid Price pursuant to Clause 3.1.2 (b) under Data sheet.

We undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or any of the three conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date(2) days after the dead line for submission of Bids as such deadline is stated in the instructions to Bidders or as it may be extended by the Employer, notice oif which

extension(s) to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not later than the above date.

DATESIGNATURE OF THE BANK.....

WITNESSSEAL.....

.....

(Signature, Name and address)

.....

1. The bidder should insert the amount of the guarantee in words and figures denominated in Indian Rupees. This figure should be the same as shown in Clause 3.1.1 under Data sheet of the instructions to Bidders.

2. 365 days.

DOWNLOADED CERTIFICATE

Certified that **no correction/ alteration on the bid document as found in the web site** was made by me/us and I/we shall abide by all the terms, conditions and specifications contained in the bid document.

Tenderer