



VOLUME - II, PART - 1

SECTION – 1

GENERAL TECHNICAL SPECIFICATION

CIVIL



TABLE OF CONTENTS

1.0.0	GENERAL	3
2.0.0	SITE INFORMATION	4
3.0.0	SCOPE OF WORK AND SERVICES	5
4.0.0	DATA TO BE FURNISHED BY BIDDER AT THE TIME OF BID	7
5.0.0	INSPECTION OF SITE BY BIDDER	8
6.0.0	CONSTRUCTION TOOLS AND MATERIALS SUPPLIED BY CONTRACTOR	8
7.0.0	WORK EXECUTION AND SUPERVISION	9
8.0.0	SUBMISSION OF DOCUMENTS TO THE OWNER AFTER AWARD OF CONTRACT	10
9.0.0	PLANT FACILITIES AND LAYOUT	13
10.0.0	LIST OF FURNITURE/FIXTURE ITEMS	13



1.0.0 GENERAL

This specification covers design, preparation of general arrangement, construction drawings, fabrication drawings and supply of all labours, materials and construction of all civil, structural, architectural, electrical, and mechanical works complete.

On ENGINEERING PROCUREMENT CONSTRUCTION (EPC) basis for all works and structures described in the specification, all complete as per scope of work.

The work to be performed under this contract consists of design, engineering and providing all labour, materials, consumables, equipment, temporary works, temporary storage sheds, temporary colony for labour and staff, temporary site offices, constructional plants, fuel supply, transportation and all incidental items not shown or specified but reasonably implied or necessary for the completion and proper functioning of the works and other systems in this contract, all in strict accordance with the specifications including revisions and amendments thereto as may be required during the execution of work.

The scope shall also include setting up by the Contractor a complete testing laboratory in the field to carry out all relevant tests required for the Works.

The work shall be carried out according to the design / drawings to be developed by the Contractor and approved by the Owner / Owner's Engineer.

For all works, facilities, systems, structures, etc., necessary layout and details are to be developed by the Contractor keeping in view the statutory and functional requirements and providing enough space and access for operation, use and maintenance.

Certain minimum requirements are indicated in this specification for guidance purpose only. However, the Contractor's offer shall cover the complete requirements of the buildings and facilities and providing enough space and access for operation and maintenance as per the best prevailing practices and to the complete satisfaction of the Owner.

All works shall conform to Indian Standards and Codes and all local and state regulations. Where requirements are at variance, the more stringent of them shall govern.

All equipment's and materials shall be arranged / procured by the Contractor.

The Contractor's work shall cover complete requirements as per IS codes, fire safety norms, requirements of various statutory bodies, best prevailing practices and to the complete satisfaction of the Owner / Owner's Engineer.



The Contractor shall make the layout and levels of all works from the general grid of the plot and the nearest benchmark of Govt. dept. as per the directions of the Owner / Owner's Engineer. The Contractor shall be solely responsible for the correctness of the layout and levels and shall also provide necessary instruments, materials, access to works, etc., to the Owner / Owner's Engineer for general checking of the correctness of the works.

All the quality standards, tolerances and other technical requirements shall be strictly adhered to.

The Contractor shall fully apprise himself of the prevailing conditions at the proposed site, climatic conditions including monsoon pattern, soil conditions, local conditions and site-specific parameters and shall include for all such conditions and contingent measures in the bid, including those which may not have been specifically brought out in the specifications.

In case of any conflict between stipulations in various provisions of the specification, the most stringent stipulation would be applicable for implementation by the Contractor without any extra cost or time to the Owner.

The contractor shall obtain approval of relevant drawings from concerned authorities before taking up the construction work.

All works shall conform to the specification. The work shall conform to high standards of design, engineering and workmanship. Design and construction shall conform in every respect to all local and state regulations governing such works and to stipulations of Indian Standards and other statutory requirements unless stipulated otherwise in detail specification.

The Contractor shall organize his own arrangement to transport his equipment, men and material so as to match the construction schedule.

The contractor shall rectify defects for all works for a period of ONE year as per Defect liability period.

2.0.0 SITE INFORMATION

2.1.0	Site Location	:	Khavda Village, Under Bhuj Taluka, in the Great Rann of Kutch, Gujarat
2.2.0	North Block Coordinate	:	24°05'13.38"N 69°36'30.12"E
2.3.0	South Block Coordinate	:	24°01'52.51"N 69°35'51.03"E
2.4.0	Road Approach	:	SH 45 BSF checkpost to Vighakot



2.5.0	Nearest Air Port	:	Bhuj
2.6.0	Nearest Sea Port	:	Kandla
2.7.0	Nearest Railway Station	:	Bhuj
2.8.0	District	:	Kutch
2.9.0	State	:	Gujarat
2.10.0	Finished Ground Elevation above sea level (Mean Sea Level)	:	1-2 m (as specified in RFP Roads & Drains package)
2.11.0	Ambient temperature		
	a) Maximum Temperature	:	39.5 °C
	b) Minimum Temperature	:	9.0 °C
2.12.0	Rainfall intensity (design)	:	22.5 mm/hour – 2 years return period
2.13.0	Wind Data		
	Basic wind speed	:	55 m/s (As per IS: 875 – Part III)
2.14.0	Seismic Data		
	Zone	:	V (As per IS: 1893 – Part I)
2.15.0	Soil Condition	:	Type of foundation, depth of foundation, safe bearing capacity, pile capacity, pile diameter will be as per the recommendations in the soil investigation report of Pooling substation 1 which is very close to the proposed desalination plant.

3.0.0 SCOPE OF WORK AND SERVICES

The Scope will cover but not limited to the works of the following items / structure / systems / facilities.

1. Borewells - 4 Nos, with RCC platform, shed and fence covering, Conveying main from borewell to Desalination plant
2. Construction of all RCC structures associate with Desalination plant capacity 2 x 0.5 MLD with reject conveyance, fencing with Gate etc.
3. Approach road to Desalination plant and borewells shall be provided with culvert to cross the main drain of RE park road
4. Cable trench connection from PSS-1 to Desalination plant via GIPCL site residence.



5. Construction of Raw Water Pump house to intake water from pond 2 to Desalination Plant Raw Water Tank as per the drawing attached in annexures.
6. Raw water intake piping & piping support structures from pond 2 to Pump house.
7. Construction of RCC inlet chamber for the pond water clarification system.
8. Construction of RCC circular clarifier tank including base raft.
9. Provision of RCC base pedestal to support ground-mounted circular tanks and DMF vessels.
10. Construction of RCC pedestal for pump support within the pond water clarification system.
11. Construction of RCC pit for sludge removal operations.
12. Construction of RCC chambers/Pits for all type of valves.
13. Provision of RCC blocks with bitumen paint to all surfaces for cable laying.
14. Provision of RCC sleepers with bitumen paint to all surfaces for Water pipelines.

Any other items, structures and works necessary and not specifically mentioned here but required for construction, operation and maintenance of the works and systems in this contract conforming to other sections of this tender document are deemed to be included in the scope of the Contractor.

The work also includes:

- Design and preparation of working drawings, fabrication drawings, excavation drawings, shuttering drawings, bar bending schedule drawing and construction of all structures.
- Preparation of as built drawings of all structures and facilities to reflect as built status of construction AutoCAD latest version in CD / DVD and hard copies
- Painting of all applicable works - high saline C5-M zone as per ISO 12944.
- Handing over of complete facilities to the satisfaction of Owner.
- All temporary roads and approach roads inside the project area are necessary for construction purposes with an adequate parking area for heavy vehicles to be constructed including formation over the graded site. The road gradient shall not be steeper than 1 in 33 at any location with necessary culverts.
- All statutory clearances / NOC required for implementation of the project from various departments / agencies, shall be obtained by the Contractor.
- The Contractor shall fill or excavate the areas to the required formation levels as indicated in the plot plan and dispose the excavated materials as directed by the Owner.

All buildings / structures / areas shall be provided the following as applicable.



Plastering, painting, plumbing, sanitation, water supply, electrification, lighting, air conditioning, fire-fighting, anti-termite treatment, plinth protection, damp proof course, garland drains, septic tanks, furniture, doors, windows, rolling shutters, ventilators, approach roads, color and whitewashing, sunshades, false ceiling, false flooring, flooring, under deck insulation, water proofing, roof treatment, rain water down take pipes, stair case, porch, potable water tanks, fans, etc.

4.0.0 DATA TO BE FURNISHED BY BIDDER AT THE TIME OF BID

A write-up on survey to be undertaken indicating grid, intervals for taking spot levels, contour intervals, precision of surveying instruments proposed to be used, drawings that will be prepared, details to be covered by survey etc.

General arrangement / architectural drawings for all structures showing dimension, levels plans, sections, elevations, loadings, materials proposed, types of framings, wall / cladding, floors, roofs types of finishes, construction methodology, design criteria etc.

All deviations from bid document shall be furnished by bidder.

List of equipment to be deployed by the bidder and by other subcontractors to be associated with to be furnished.

List of software proposed to be used against various areas, for analysis, design, construction etc, their source and along with validation report for the software.

The list of documents indicated elsewhere of this section to be submitted by the Contractor to the Owner for his approval and manner in which the same needs to be submitted. No construction shall commence at site without obtaining approval from the Owner on these documents. Therefore, it is necessary that bar charts for building / structure / area wise shall be submitted for design / drawing activity indicating.

- A level-1 part showing the start and completion date of all construction activities.
- A level-2 part showing the time required for preparation of design criteria, for approval of design criteria by Owner after checking and clearance given by the Owner, time required for detailed design and drawing preparation and time required for approval of design and drawing by Owner after checking and clearance given by the Owner. This part shall take into account the construction schedule (Level-1 part).

A detailed note on quality plan both for design and construction activity proposed to be adopted for obtaining quality work.



List of all sub-contractors that the bidder proposes to employ, in case the contract is awarded, indicating their addresses with telephone number, experience on similar jobs, name, qualification and experience of persons who shall be involved in the job on behalf of the Contractor etc shall be submitted to Owner.

5.0.0 INSPECTION OF SITE BY BIDDER

Bidder shall inspect the site, examine and obtain all information required and satisfy himself regarding matters and things such as access to site, communications, transport, right of way, the type and number of equipment and facilities required for the work, availability of local labour, materials and their rates, local working conditions, weather, subsoil conditions, natural drainage etc, ignorance of the site conditions shall not be accepted by the Owner as basis for any claim for compensation or extension of time.

The submission of a bid by the Bidder will be construed as evidence that such an examination was made and any later claims / disputes in regard to rates quoted shall not be entertained or considered by the Owner.

6.0.0 CONSTRUCTION TOOLS AND MATERIALS SUPPLIED BY CONTRACTOR

The contractor shall provide and maintain at the site the necessary numbers and types of machinery and equipment including survey instruments in good working condition for properly setting out and timely completion of the various works covered under this specification. All arrangements for transporting the equipment to and from the site shall be done by the Contractor at his own expense. No claim shall be entertained for mobilizing additional equipment and / or personnel to complete the work within the stipulated time.

The contractor shall provide all fuels and lubricants required for the operation and maintenance of construction machinery and equipment as well as his vehicles transport at his own cost.

The Contractor shall ensure that the work shall proceed uninterrupted even in the event of power failure. As such, adequate number of diesels operated equipment shall be provided by the Contractor at his own cost as an alternative arrangement, in case electrically operated equipment are proposed to be brought to site.

Adequate stocks of construction material shall be ensured such that there are no interruption of works due to shortage of material at any point of time during the contract period and extended periods, if any.

All materials supplied by Contractor shall be original, new and of the best quality and shall conform to the specifications given. Approval in writing shall be obtained from the Owner before any alternative or equivalent material is used other than what is specifically mentioned in the drawings.



The contractor shall furnish the manufacturer's test certificate for all the manufactured items supplied by him. Representative specimens of the material shall also be submitted to the Owner and shall be tested at a recognized testing laboratory at Contractor's cost in case Owner so desire.

The Owner reserves the right to test any construction material supplied by the Contractor in an established testing laboratory at Contractor's cost.

The Owner reserves the right to instruct the Contractor to remove all materials which do not meet the specification requirements.

7.0.0 WORK EXECUTION AND SUPERVISION

Contractor shall have at the site accredited and qualified engineers and foremen / supervisors with adequate number of years of experience in execution of similar works and also operators of machinery and equipment, for satisfactory progress and timely completion of the works.

The contractor's engineer-in-charge of the work at site shall be capable of interpreting the specifications and drawings and make adequate site decisions as and when required. He shall also take instructions from the Owner and be responsible for carrying out the instructions.

The contractor shall be fully responsible for the correctness and accuracy of the tests performed, results obtained/tabulated, interpretation of test results and recommendations made. The work shall be executed in a professional manner, with fully understanding of the importance of work for a project of this magnitude.

In the event of occurrence of any accidents at / near the site of the work or in connection with execution of the work, a report shall be made immediately to the Owner, giving full details of the accident. He shall also report such accidents to all the competent authorities wherever such reports are required by them as mandated by statutory laws.

All temporary electrical installation shall be supervised by a qualified electrical supervisor of the Contractor.

Owner reserves the right to order in writing, from time to time, during the progress of the work, removal and re-execution of any work which in the opinion of the Owner, is not in accordance with the specification.

During inclement weather, rains etc., Contractor shall suspend all works for such time as the Owner may direct and shall protect from damage all works already in progress or completed just then. All such temporary protective measures shall be at the Contractor's cost and any damage to works shall be made good by the Contractor at his own expense.

Should the work be suspended by reasons of strikes / riot by Contractor's own employees or any other causes whatsoever save and except the force majeure condition, Contractor shall take all



precautions necessary for the protection of work and make good at his own expense any damage arising from any other than these causes. No compensation, whatsoever, will be given by the Owner.

During the course of Contractor's works, other work either by the Owner or by other Contractors or by both simultaneously will be in progress within the project area. The contractor shall make his best effort to work in harmony with others in the best overall interest of the project and towards its speedy completion.

A Construction quality control laboratory shall be set up with all required testing equipment. The Construction quality control laboratory shall be handed over to the Owner and laboratory shall be under Bidder control. However, testing of all materials has to be carried out by the Contractor. The bidders have to re-calibrate the testing equipment's brought to site by competent authorities from time to time to maintain the accuracy.

The bidder should furnish the list of equipment's that will be provided in the laboratory.

The Contractor shall be responsible for maintaining cleanliness of the site. The site shall be free of unwanted rubbish or filth which is hazardous and detrimental to health and affects safety of the workplace.

All material supplied shall conform to the specification. Entry of unwanted materials shall be prohibited.

8.0.0 SUBMISSION OF DOCUMENTS TO THE OWNER AFTER AWARD OF CONTRACT

The Contractor shall study the soil investigation already conducted for the PSS1 which is on the North side of the Proposed Desalination plant. Bidder requested to select the bore with severe or worst data and accordingly make design and engineering right after issuing LOI keeping in firm to go with pile foundation only.

The Contractor shall begin further works like preparation of design criteria only after obtaining approval from the owner.

Detailed design calculations / drawings shall be commenced by Contractor only after approval is obtained from the Owner on the basic design criteria for building / structure / areas to be submitted by the Contractor. No later deviation from the approved design criteria shall be permitted unless specifically approved by the Owner in writing, prior to its adoption.

Design calculations and drawings and other documents shall be submitted sequentially after obtaining approval in a phased manner as per the approved L2 schedule. The contractor shall ensure that design calculations / drawings for several structures are not submitted at one time. For this purpose, design / drawing submission schedule furnished during bidding stage and agreed



upon by Owner shall be followed. The owner will review and furnish comments / approval, if any, to the designs and drawings. The Contractor shall resubmit the design documents and drawings within a maximum period of one week from the date of receipt of comments by the Contractor. The timely submission of designs / drawings to the Owner for review / approval is the sole responsibility of the Contractor and postal or any other delays as reasons for late / non-submission shall not be entertained by the Owner.

Should there be a requirement for the preparation of separate drawings to show enlarged details to facilitate construction / erection, then such drawings shall also be prepared by the Contractor at no extra cost.

Design drawings shall indicate structural arrangements, member sizes, construction joints, water stops, loadings etc., so that the drawings indicate clearly all the necessary information brought out in relevant design calculations.

Design drawings showing typical connection details conforming to design assumptions shall be submitted for approval before starting fabrication drawings.

Preparation and review of structural steel fabrication drawings is entirely of the responsibility of the Contractor and will not be approved by the Owner. However, all fabrication drawings shall be submitted by the Contractor for Owners reference and records prior to commencement of fabrication.

The bar bending schedules for all concrete works shall be prepared by the Contractor and submitted to the Owner for his reference.

All architectural features of buildings shall be detailed by the Contractor's qualified architect. Detailed drawings along with schedule of doors / windows etc. floor / wall finishes including colour scheme shall be submitted for obtaining approval from the Owner.

All construction drawings shall include total quantity of concrete (grade wise), reinforcement (diameter-wise) and structural (section wise).

Approval / comments conveyed by the Owner neither relieves the Contractor of his contractual obligations and his total responsibility for correctness of dimensions, materials of construction, loadings, quantities, design details, assembly fits, performance particulars, safety and stability of the structures including foundation / appurtenances and conformity of supplies with the statutory laws as may be applicable, nor does it limit the Owners right under this contract. No change in the approved designs / drawings shall be permitted without prior written approval of the Owner.

Owner or his representative has every right to go to Contractor's design office to check the quality control being implemented at their design office to ensure that the documents being prepared are



of approved quality. The Contractor shall provide all assistance required by Owner for carrying out the audit.

Checking for any interference is the sole responsibility of the Contractor.

Specifications issued to sub-contractors must be submitted for approval.

All design calculations and drawings shall be in English and shall be in SI units.

Designs drawings and other documents submitted by the Contractor shall be thoroughly checked and approved by the authorized Contractor's engineers. Any unchecked / unsigned documents will not be reviewed by the Owner. Also design calculations are not accompanied by supporting engineering drawings, incomplete or shabbily done design calculations, design calculations without adequate reference or backup data and documents where previous comments have not been incorporated will not be reviewed by the Owner. No claim from the Contractor for extension of time or extra cost on this account shall be entertained by the Owner under any circumstances.

No check will be specifically carried out by the Owner to verify arithmetical / numerical accuracy of the calculations, input data, compatibility of dimensions among various drawings or between drawings and design calculations. These shall remain entirely the Contractor's responsibility.

The contractor shall submit copies of designs / drawings prepared by him in accordance with the distribution schedule.

All modification suggested by the Owner to meet specification requirements and sound engineering practice shall be incorporated by the Contractor at no extra cost to the Owner. In this respect, the decision of the Owner shall be binding on the Contractor. Owner will accord his approval only after the Contractor has incorporated in the design and drawings all modifications required by the Owner.

Soft copies of all design calculation and drawings shall be submitted for records after the approval of the Owner.

All structural analysis may be done by adopting STAAD pro. Water supply distribution network shall be done by approved software. The complete input (soft copy in editable format) and output data (soft copy) are to be submitted for Owner's review and approval.

Payment will not be made for defective works and other works completed without approved design and drawings.

Final completion report shall be furnished by the Contractor including narrative report with as built drawing in consultation with Owner. Hard copies of 5 set and soft copies 3 set.



9.0.0 PLANT FACILITIES AND LAYOUT

Plant facilities shall include a Control room, In charge room, server /panel rooms, Technician room, lockers, storeroom with racks, maintenance room with workshop area, laboratory room, Toilet blocks, septic tank, soak pit.

The control room shall be RCC with Laboratory facilities.

Each room shall be provided with an identification name plate of 2mm thick stainless steel with black letter engraving on it. Letter size shall be decided during detail engineering.

The dimensions of all rooms shall be based on area covered by Mechanical /electrical / I&C / Mechanical equipment plus working space plus free space and additional space reserved and/or required for future installation of equipment if any.

Shall also connect PSS-1 through designated RCC paved walkthrough secured with fence and gate.

10.0.0 LIST OF FURNITURE/FIXTURE ITEMS

The quantities indicated below is tentative. Additional items require complete and satisfactorily functioning of the overall Desalination plant.

- Industrial locker for 10 individual compartments with powder coated, 0.6mm thick, duplicate keys, locker number and name plate pocket, O&M room make of Nilkamal, Godrej.
- Heavy duty metal locks with 3 set keys of approved make with/without GI metal chain link
- Almirah with lock-in facility, key and key tag make of Godrej, Nilkamal or equivalent in storeroom
- Desks, Chairs, drawer/cabinet for office rooms, O&M rooms make of Godrej, Durian, Zuari, Lexus
- Powdered coated Steel Drawer Cabinet to file documents make of Nilkamal, Godrej
- 20 lit capacity Water dispenser with Hot, Cold and Normal water with stainless steel for tank corrosion resistance of Voltas, Blue Star, Mitsubishi make
- Heavy-duty plastic/fiber/powder coated Steel Rack with 4 shelves for storage as per O&M requirement.
- Wall Clock (Analogue) of approved make- 03 no. of Titan, Ajanta make
- 2 no. of Electrical Water kettle of 1 lit capacity
- 1 no. Electric induction cooktop with a rating capacity of 2000Watt make of Havelles, prestige, Philipps
- 1 no. of 250 lit capacity of whirlpool, Samsung or LG make
- Permit key tag - with permit box with mounting facility-2 no.
- Polished Wood make Dining table with chairs of size 6 person
- Heavy duty 6-step folding ladder with a platform -Portable aluminium ladder - 02 no.