



**Republic of Maldives**

**Ministry of Environment**

## **TERMS OF REFERENCE**

*Consultancy Services for Design of Regional Laboratory Facility in  
L.Fonadhoo Maldives*

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**Issued By:**

Water and Sanitation Department  
Ministry of Environment

## **1 Introduction**

The Government of Republic of Maldives has allocated funds for the development of Regional Laboratory Facility in L.Fonadhoo and intends to apply part of the proceeds towards procuring the services of Design of Regional Laboratory Facility in L.Fonadhoo.

## **2 Background**

“Provision of safe water to all” is a constitutional right mandated upon the Government of Maldives. Access of water facilities to the island communities is defined as safe water through a piped network with household connections. In its continuing efforts the Government has provided access to water facilities in 39 islands with 148 islands in various stages of design, civil works and tendering ongoing, and intends to provide the service of safe water to the entire population by end of 2023.

The isolated geographic nature of the archipelago, adheres challenges for both the regulator; Environmental Protection Agency (EPA) and the utility companies for both water supply and sewerage facilities in the islands towards assurance of the water supply and waste water disposal quality under environmental act and recently ratified water and sewerage act (Act no. 8/2020) and regulations.

The lack of adequate laboratory facilities in outer islands is noted as the key challenge to the sector. As such, the water supply and sewerage systems are designed in such a way that water quality testing could be done at island level through in-built laboratories. However, these laboratories are only limited to conduct tests that can ensure the physical and chemical quality of the water and waste water. Hence, to ensure that the quality of water supplied to household and waste water disposed is consistent by continually monitoring; physical, microbiological and chemical quality of water/waste water.

Therefore, in order to ensure access of safe water and proper disposal of waste water, the followings outputs are proposed as below;

It is proposed to have 6 regional laboratories across the nation. These locations have been chosen to be advantageous in terms of proximity to the service centers. It is proposed to replicate this effort to ensure the policy of “Establish and improve regional water quality testing facilities to ensure timely water quality monitoring and reporting “(MEE 2017, National Water and Sewerage Policy, Policy Goal 1.7) and Strategic Action Plan -2019-2023.

Hence, Ministry of Environment intends to develop a fully equipped regional laboratory facility at L.Fonadhoo

### **3 SCOPE OF WORKS**

#### **Phase IA: Data collection – Complementary Diagnosis**

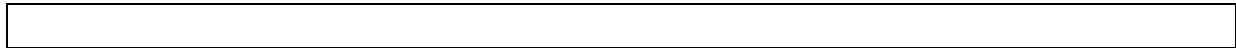
The consultant is to carry out the following necessary investigations required for the pre-design phases but not limited to:

- Conduct desk review of the local level regulatory water quality testing requirements set for water and sewerage services and international ISO certified laboratory testing requirements and related equipment's.
- Conduct topography, elevation, accessibility and area requirements for the development of the regional laboratory facility and communicate with relevant stakeholders such as island council, island utility service provider, Ministry of National Planning, Housing and Infrastructure. In addition to this conduct survey to identify existing utility services and marking their locations in streets of island topographic map.
- Identify existing waste management practices
- Identify the possible customer market within the set periphery of the regional laboratory not limited to ; resorts, commercial industries, government facilities, individuals etc.
- Identify other Potential Constraints, such as land limitations, environmental and social risks and any other relevant issue.

#### **Outputs of Phase IA**

Inception Report will include at least:

- a. Water quality testing requirements set for water and sewerage services and international ISO certified laboratory testing requirements and related equipment's
- b. ISO 17025 standard certification requirements and procedures
- c. Topography, elevation, accessibility and area requirements for the development of the regional laboratory
- d. Existing utility services and marking their locations in streets of island topographic map.
- e. Identify other Potential Constraints, such as land limitations, environmental and social risks and any other relevant issue.
- f. Include possible customer market within the set periphery of the regional laboratory not limited to ; resorts, commercial industries, government facilities, individuals



### **Phase IB: Preliminary Design**

Based on the initial data collected and presented in the Phase 1A work, the consultant shall prepare a preliminary design report including the findings and submit this to MEE for approval. The report shall address the following, but not limited to:

- 1) Develop Concept design for the main building and support buildings
- 2) Develop Concept service drawings
- 3) Develop Evacuation Procedures, Safety and fire protection requirements and methodologies
- 4) Summary of relevant items for testing of water and waste water samples as per mandatory guideline.
- 5) Develop a business model incorporating financial feasibility analysis with Technical and economic comparison based on the concept
- 6) Develop ISO 17025 standard certification requirements and procedures
- 7) Develop feasible waste management plan for laboratory waste

#### **Output of Phase IB**

Preliminary Design Report will include at least :

- 1) Concept design for the main building and support buildings
- 2) Concept service drawings
- 3) Evacuation Procedures, Safety and fire protection requirements and methodologies
- 4) List of equipment and calibration solution / chemicals to be used for testing
- 5) Business model, financial feasibility analysis with Technical and economic comparisons
- 6) ISO 17025 standard certification requirements and procedures
- 7) Feasible waste management plan for laboratory waste

### **Phase IC: Environmental and Social Impact Assessment (EIA)**

The consultants shall undertake an environmental and social impact assessment of all solutions to the satisfaction of EPA, including but not necessarily limited to the following tasks:

- Discussions in association with MoEnv and EPA to confirm the scope of the environmental and social issues and studies for this package.

- Environmental and social studies (desk and additional field investigations and community consultation as required) to collect the necessary baseline data that will provide the basis of identifying anticipated environmental and social impacts of the project (it is anticipated that appropriate modelling will be required as part of this work).
- identification of potential avoidance and mitigation measures and discussion of these with MoEnv,
- finalization of recommended avoidance and mitigation measures required during design, construction and operation of the project,
- developing cost estimates of the mitigation measures
- preparing a project-specific Environmental and Social Management Plan / avoidance / mitigation management action

This task will lead to a specific report to be submitted to EPA.

The other phases of this consultancy shall account for the recommended avoidance and mitigation measures identified in the relevant documentation and specifically, the Environmental and Social Management Plan.

Without prejudging the full scope of issues, the EIA for this project shall address at least the following issues:

- all effects of construction and operation on terrestrial and marine environment;
- effects of land disturbance associated with any earthworks, pipelines, landslip protection;
- effects from the use of chemicals etc;
- effects of noise on local populations;
- production of waste from the project; and
- any contamination of groundwater aquifers.

To prepare the work, the Consultants will use the EIA guidelines. The analysis of the environmental and social aspects of the various solutions will be integrated in the technical and economic comparison so that MoEnv is able to select works programmes that are suitable for this project

<p><b>Output of Phase IC</b> :Report on Environmental and Social Impact Assessment (EIA) acceptable to EPA</p>
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## **Phase II: Detailed Design**

The second stage will concern detailed design of the regional laboratory main building and support structures

The Consultants will take into account the Environmental Impact Study in his detailed design and will plan for the implementation of the mitigation measures as stated in the EIA and recommended by EPA.

The Detailed Design Report will contain three parts:

**Part 1 (Main report)** will include:

*The detail design report should be in accordance with construction guidelines and building code*

*The detail design should be approved by registered architectural checker, structural checker, architect and licensed engineer.*

*The electrical drawing and structural drawing should be check and approved by Ministry of National Planning, Housing and Infrastructure and Maldives Energy Authority.*

**Part 2 (Bill of Quantities and Cost Estimate)** will include a Bill of Quantities for each structure and then by type of works (earth, concrete, mechanical, electrical). The Consultants will here explain the unit costs as well as the percentage considered for miscellaneous and contingencies. Finally, cost estimation will be carried out on the basis of quantities and unit costs. The Consultants will keep this cost estimate confidential.

The capital costs shall be derived from the Bill of Quantities and unit rates developed from recent tender for works in the MoEnv, using either unit prices or cost curves and indexed to inflation. The minor items will be estimated using historic current rates and prices prevailing in the Maldives islands.

For the mechanical and electrical equipment, cost estimates will be prepared based on recent experience of the cost of similar work and / or quotations from internationally recognized manufacturers and suppliers. The cost estimates will allow for transportation and erection on site, all out-site costs and off-site overheads. Costs estimates will be sufficiently detailed to ensure a +/- 10% (?) value from construction bids received.

**Part 3 (Technical Report)** will include:

A drawings section that will include a first sub-section related to the existing structures ('reference drawings') and a second sub-section related to rehabilitate or new structures (including general layouts, civil structures and electromechanical equipment's).

**Outputs of Phase II:**

Report II will include the detailed design of the 'selected solution for the island including:

- the Main Report;
- the Bill of Quantities and Cost Estimate;
- Technical Report (Detailed Drawings)

Final version of the Detailed Design will support preparation of the Tender Documents for the selection of contractors.

### **Phase III: Tender Documents**

#### *Tender Documents*

The Consultants will prepare tender documents accordingly including the following. The Consultant shall also prepare Prequalification Documents if required by the Client

#### **Volume 1: Tender and Administrative Documents**

#### **Volume 2: Technical Specifications and Schedules**

#### **Volume 3: Drawings and Layouts**

**Volume 1** will include at least the following:

- **Invitation to Tender;**
- **Description of the Works and Quantities;**
- **Instructions to Bidders;**
- **Conditions of Contract, Form of Tender (and Appendix);**
- **Bill of Quantities and Schedules;**
- **Form of Contract Agreement, Form of Tender Security, Form of Performance Security, Form of Guarantee for advance payment**

**Conditions of Contract** will be incorporated as the final legal agreement to be drawn up between the Contractor and the Client. The Conditions of Contract would be drawn up in close co-operation with the Client and would incorporate such special clauses as may be required.

Typically the Conditions of Contract will be based on the following:

- For Civil Engineering works: FIDIC Conditions of Contract for Construction (MDB Harmonized Edition), For Building and Engineering Works Designed by the Employer.

The **Bill of Quantities and Schedules** will be prepared for all the tender packages as a basis for tendering and for payment under the Contract. Civil Engineering Standard method of measurement shall be recommended wherever possible.

**Volume 2** will include Technical Specifications and Schedules. Technical Specification will be prepared for all items to be constructed, supplied or erected. Materials and work specifications will cover all aspects of materials and equipment to be provided. Requirements for operating /maintenance and training manuals that include equipment cut sheets, SOPS, and 5 year spare parts lists shall be incorporated into the specifications.

The Consultants will use local or national standards where possible. Where no suitable local or national standards exist then international standards such as BS, ASTM, ISO etc. will be used.

Where possible, the specification of materials (locally produced or imported) will be specified. Construction Schedules will be issued in details.

**Volume 3** will be based on part 3 of the detailed design. All drawings will show clearly defined contract limits relating to the various divisions of works. Drawings will include general arrangement drawings, sections, elevation, typical details and typical reinforcement detailed. In addition detailed reinforcement drawings and bar schedules will be included in the tender documents. Drawings for mechanical and electrical equipment will show facility piping layouts, main outlines and leading dimensions in sufficient details for the manufacturers to design the adequate equipment. Electrical drawings to include appropriate power distribution single lines, lighting systems, grounding systems, specific equipment control schematics, etc. to ensure sufficient detail is provided to operate and maintain equipment. Ensure systematic labeling of equipment and related wiring is provided in sufficient detail to support troubleshooting and maintenance.

**Outputs of Phase III:**

Report III including the tender documents including:

- Volume 1: Administrative and tender documents;
- Volume 2: Technical specifications and schedule;
- Volume 3: Construction Drawings and layouts

Draft Contract Agreement

## **4 Project Team**

A total of 5 staff will be required and situated in the locations specified below;

#	Post	No
1	Project Manager (Team leader)	1
2	Water / Civil engineer	1



3	Electro- Mechanical Engineer / Service Engineer	1
4	EIA Specialist	1
5	Surveyor	1

Note: The expertise opinion from a design consultant of similar project need to be included as a consultant agreement or part of the team

**a. Similar Assignments**

To be eligible for this assignment, the consultancy firm must demonstrate past experience in performing the services (description of similar assignments, Value of such assignments). The Firm shall have carried out a minimum of Four (4) similar assignments with a minimum contract value of MVR 250,000 each within the last 5 years (Oct 2020- Oct 2015).

**b. Qualifications of the Design and Consultancy team**

The Consultant should submit full CV's for each of the proposed staff members highlighting the criteria given below.

**a. Project Manager**

Bachelor's degree in Project Management or Environmental Management/Science or in a related field with minimum 5 years' experience in project management, along with 5 years of specific experience in the field of construction projects, Water and Sewerage projects.

**b. Civil Engineer**

Bachelor's degree in Civil/Environmental Engineering with minimum 05 years' experience along with 3 years of Specific experiences in designing infrastructure project, water and sewerage systems.

**c. Electro-Mechanical Engineer / Service Engineer**

Bachelor's Degree in Electrical/Mechanical Engineering with minimum 03 years' experience along with 2 years of specific experience in designing Electro-Mechanical components of Water/Sewerage Facilities.

**d. EIA Specialist**

Bachelor's Degree in Environmental Science/Environmental Management or related field with minimum 5 years' experience in conducting Environmental Impact Assessment (EIA). Experience in conducting EIA for infrastructure projects will be given preference.

**e. Surveyor**

Diploma in Surveying with minimum 03 years' experience along with 2 years of specific experience in conducting land surveys.

## 5 Equipment, logistics and facilities

The Consultants shall ensure that experts are adequately supported and equipped. In particular he/she shall ensure that there are sufficient administrative, technology, computing and secretarial provisions to enable experts to concentrate on their primary responsibilities. The Consultant shall meet the full costs for the supply of the teams including all travels, remuneration, insurance, emergency medical aid, facilities and all else necessary for the competent operation of the teams.

## 6 Remuneration

Remuneration will be in accordance with the schedule specified below.

DESCRIPTION	ALLOCATION	REQUIREMENT
The Consultant shall submit to the Client itemized statements, according to the progress of Services, as follows:		
Payments for these phases will be according to the progress of Services. The total amount for these phases will be paid as follows:		
Payment upon Submission of final Inception Report	15%	
Payment upon Submission of final Concept Design Report	20%	
Payment upon approval of EIA report and approval of Detailed Design Reports	35%	
Payment upon approval of final Tender Documents and Contract Document	30%	
<b>Total Payment for Design</b>	<b>100%</b>	

## 7 Deliverables

The consultants shall submit the following reports

- Inception Report (2 hard copies + Soft copy)
- Concept Design Report (2 hard copies + Soft copy)
- EIA report (Hard copies + Soft copy as per EPA requirement)
- Detailed Design Report (3 hard Copies + 1 soft copy) as per Design guidelines of Ministry of Planning and Infrastructure. (Stamped copies including building approval forms)
- Bill of quantities and Technical specifications (2 hard copies + 1 soft copy)

- Complete bid document and Contract Document (2 hard copies + 1 soft copy)

## **8 Duration of the Assignment**

All surveying, preparation and submission of design documents should be completed within 04 months. Tender assistance should be given to Client and NTB during tender, evaluation and award stage.

The period of total engagement will be 06 months commencing upon the signing of the contract agreement with the selected Consultant for the Design Consultancy Works. Tentative schedule showing the engagement is shown below.