



**Road Development Corporation Limited
Republic of Maldives**

**Terms of Reference for
CONSULTANCY SERVICES FOR DH. KUDAHUVADHOO MAJOR ROADS**

Date: 16 November 2021

1. BACKGROUND

Road Development Corporation Limited, an incorporated limited liability company operating under the registration number C10482019 and having its registered office at MSL Buildings, First Floor, Malé, Republic of Maldives (herein after called and referred to as “the Employer”), wishes to receive bids for the consultancy services for

- Preparation of Environmental Impact Assessment (EIA) for Dh. Kudahuvadho Major Roads,
- Detailed surveying of Dh. Kudahuvadho, and
- Designing of storm water management system in Dh. Kudahuvadho.

2. SCOPE OF WORK

The Consultant will provide consultancy services for the preparation of EIA for Dh. Kudahuvadho Major Roads, undertake the detailed surveying of Dh. Kudahuvadho and design the storm water management system based on the surveying results and guidelines set by the Employer. The scope of individual works are specified as follows.

A. Consultancy services for preparation of EIA

The Consultant will have to provide consultancy services for preparation of EIA for Dh. Kudahuvadho Major Roads, including the submission fees and all relevant data collection.

After the contract has been awarded and accepted, the scope of the EIA document and relevant data will be provided in the Environmental Protection Agency (EPA) Scoping meeting. This meeting will discuss the following topics.

- Project area
- Baseline studies
- Project details
- Description of the environment (impacts on the natural environment and impact assessment with proposed stormwater management system design)
- Removal and relocation of vegetation
- Legislative and regulatory considerations
- Potential impacts (Impact on traffic flow, environmental, socio-economic, and socio-cultural impacts, etc...)
- Construction related hazards and risks

- Mitigation and management of negative impacts
- Alternatives to proposed project and areas
- Development of monitoring place
- Major stakeholder consultation

B. Detailed surveys

The Consultant will undertake the detailed surveying of Dh. Kudahuvadhoo.

Detailed surveys include geotechnical survey and hydrological survey required for the detailed design of the proposed roads and storm water management system. The surveys must be carried out as described below.

Geotechnical survey

Geotechnical investigation must be done to determine the physical and mechanical properties of the soil using the tests detailed below.

- 1) Physical properties of soil
 - a) Sieve analysis
- 2) Mechanical properties of soil
 - a) Standard Compact test
 - b) California Bearing Ratio test

The tests should be carried out following the guidelines described below.

Physical properties of soil

Sieve tests must be done to determine grain size of soil in an area. At least one sample must be taken from each road proposed for construction and depending on road length, multiple samples should be taken such that distance between the sampling points is not more than 200m. For every sieve test, the gradation curve must be plotted, and Coefficient Curvature (Cc) and Coefficient of Uniformity (Cu) must be determined. Well graded soils should show Cc in the range 1 to 3 and Cu higher than 6. All sieve analysis tests can be performed on disturbed samples and soil sample must be taken 100mm below the ground surface. If D60 of soil sample is more than 5mm, then the subgrade sand in that area must be sieved to remove all large soil particles, and the area backfilled with sieved sand.

Mechanical properties of soil

Standard Compaction tests and California Bearing Ratio tests must be conducted on soil samples taken from each road proposed for construction and depending on road length, multiple samples should be taken such that distance between the sampling points is not more than 200m. Standard Compaction Tests must be conducted to determine Maximum Dry Density (MDD) of soil and Optimum Moisture Content (OMC) of soil. These tests can be done in the laboratory on disturbed soil samples taken from 100mm below ground surface.

California Bearing Ratio (CBR) tests must be done to determine the stiffness of the subgrade soil. These tests must be done on undisturbed samples on actual ground. CBR tests should be done on every road proposed for construction and depending on road length, multiple samples should be taken such that distance between the sampling points is not more than 200m. The top 100mm soil must be removed

prior to performing this test. If the CBR obtained is less than 20%, then a 2nd test must be performed 3m away from the initially tested location. If the 2nd CBR is still less than 20%, then the soil must be considered too soft for pavement construction and a subgrade stabilization method must be proposed. Most common subgrade stabilization method is to remove the soft soil and backfill with a well graded sand.

Hydrological Survey

For the hydrological survey, the Consultant shall:

- undertake literature review of existing studies undertaken for Dh. Kudahuvadhoo inclusive of historical and current rainfall data for the region, any historical and current data on flooding associated with storm surges, any existing hydrological surveys,
- carry out studies to determine soil percolation rate and infiltration rate,
- develop flood risk maps for Dh. Kudahuvadhoo based on the survey data, and
- carry out the assessment of the current groundwater conditions including level and quality of the ground water.

C. Designing of storm water management system in Dh. Kudahuvadhoo

The overall responsibility and scope of work of the design consultant include, but are not limited to:

- Technical coordination of project activities related to the design of storm water management system in Dh. Kudahuvadhoo
- Manage, monitor and evaluate works related to the design
- Act as the representative of the Employer within the specified scope
- Review and verify that correct engineering practices were used in the design while ensuring the designs meet the needs and standards as per the attached design guideline for storm water drainage systems
- Review all available data to facilitate proper engineering designs such as topographic survey, geotechnical survey, hydrological survey, environmental impact assessment report, etc..., required for the design of the storm water management system
- Preparation of final designs (technical information, specifications, calculations & drawings) for the purposes of execution of the works.

3. QUALIFICATIONS FOR CONSULTANCY

To provide the top-level performance of the assigned task(s), the Consultant shall utilise qualified staff (key personnel as well as support staff) and shall contribute to the preparation, testing, and amendments till the reports are approved from all relevant authorities.

All specialists shall be certified professionals in their respective fields and will have to submit their certificates and CVs for validation. Furthermore, staff involved in the design of storm water management system must have approved storm water management system designs in their engineering portfolio.

The Consultant should utilize the following personnel.

Consultants	Qualification requirements	Number	Days	Input (person* days)
Key Experts				
Team Leader / Project Manager	<ul style="list-style-type: none"> • 3 years of experience in subject field 	1	45	45
Structural engineer	<ul style="list-style-type: none"> • 3 years of experience in subject field • Master's degree in civil engineering • Familiar with the design of drainage structures 	1	45	45
Geotechnical engineer	<ul style="list-style-type: none"> • 3 years of experience in subject field 	1	45	45
Environmental / Hydrological specialist	<ul style="list-style-type: none"> • 3 years of experience in subject field 	1	45	45
Urban drainage specialist / engineer	<ul style="list-style-type: none"> • 3 years of experience in subject field • Master's degree in civil engineering • Familiar with the design of drainage structures 	1	45	45
Hydraulic modelling specialist	<ul style="list-style-type: none"> • 3 years of experience in subject field • Undergraduate degree in civil engineering / hydrology • Able to handle GIS 	1	45	45
Draftsperson	<ul style="list-style-type: none"> • 3 years of experience in subject field • Undergraduate degree in architecture • Considerable knowledge of AutoCAD 	1	45	45
Non-key Experts				
Surveyors, Surveying assistants	<ul style="list-style-type: none"> • 3 years of experience in subject field 	1	45	45

4. EMPLOYER'S CONTRIBUTION

The Employer will grant access to all available materials which may be required by the Consultant to perform their services such as the following materials.

- Topography survey report of Dh. Kudahuvadhoo

5. DURATION OF THE ASSIGNMENT

Expected duration of the consultant assignment is **45 days**.

6. CONSULTANT'S REPORTING OBLIGATIONS

The Consultant shall submit the following reports for approval. Every report should be up to industry standards and should be accompanied by softcopies of all raw files such as AutoCAD files, high resolution pictures, etc..., in a CD.

All survey reports should include Title Page, Table of Contents, Executive Summary, Background and Objectives, Methodology, Results, Conclusion and Recommendations, and Appendices.

Deliverables	Submission Date	Language
Environmental Impact Assessment Report	Within 30 calendar days from the commencement date	English
Hydrological survey report	Within 30 calendar days from the commencement date	English
Geotechnical survey report	Within 30 calendar days from the commencement date	English
Storm water management system concept report, excluding calculations	Within 15 calendar days from the commencement date	English
Storm water management system final design report, including detailed calculations, (stormwater network, pumpstations, pumps, panel, all structural elements, and any others that may be needed for the approval of the stormwater design report)	Within 15 calendar days from the approval of Hydrological and Geotechnical reports	English

7. DATES AND VENUES FOR THE TENDER

Proposals must be submitted to the RDC head office, no later than the deadline stated below.

Proposals will be opened in a session to be held at the office stated below, and in the presence of representatives of tenderers who wish to attend. The time and date of bid opening shall be communicated to the tenderers prior to the session.

ACTIVITY	TIME & DATE	VENUE
Deadline for Bid submission Registration	21 st November 2021, 14:00hrs	Via Email to tender@rdc.com.mv
Pre-Bid Session	24 th November 2021, 11:00hrs	Road Development Corporation Limited. MSL Building. 1 st Floor Orchid Magu Male' Rep. of Maldives
Deadline for written inquiry by potential bidders:	25 th November 2021, 12:00hrs	Via Email to tender@rdc.com.mv
Deadline for Bid submission and Opening:	30 th November 2021, 11:00hrs	Road Development Corporation Limited. MSL Building. 1 st Floor Orchid Magu Male' Rep. of Maldives