



Scope of Works (SoW) – Marine Geotechnical Investigations, Detailed Drawings, & Bill of Quantities

Fishing Platform – Kulhudhuffushi, Maldives

1. Purpose

This SOW defines the works required for the design of a jetty and fishing platform on the reef flat of HDh. Kulhudhuffushi. The scope of works includes marine geotechnical investigations of the proposed location, detailed drawings for the proposed design, and the Bill of Quantities along with cost estimation for the project. The investigation focuses exclusively on offshore subsurface conditions, specifically coral sand, coral rubble, and reef limestone typical of Maldivian reef environments.

2. Site Conditions

- 2.1.1.1 Reef flat composed of coral sands and rubble overlying reef limestone
- 2.1.1.2 Limestone surface typically irregular with variable strength
- 2.1.1.3 Marine works influenced by tides, waves, swells, and currents

3. Marine Geotechnical Investigation

3.1 Required Geotechnical Works

3.1.1 Bathymetric Survey

3.1.1.1 Conduct preliminary bathymetric survey covering the area highlighted in Figure 3-1 below to determine the most ideal jetty placement. Jetty to be positioned along the shortest perpendicular route to the reef drop off zone from the shoreline.

3.1.1.2 A high-resolution bathymetric survey to follow the finalization of the jetty location. This survey shall cover the jetty alignment, platform footprint, and barge access route.

3.1.1.3 Provide seabed contours at **0.25 m intervals**.

3.1.1.4 Submit:

- a) XYZ grid
- b) Longitudinal and cross-sections
- c) CAD drawings (DWG)





Figure 3-1 Area for preliminary bathymetric survey (21.77 acres)

3.1.2 Marine Boreholes

3.1.2.1 Drill a minimum of **six (6)** offshore boreholes at **three** locations:

- a) Nearshore pile zone (1)
- b) Mid-jetty (2)
- c) Platform pile cluster (3)

3.1.2.2 Each borehole shall be advanced:

- a) **To practical refusal in reef limestone**, defined as the point where further penetration becomes impractical with the specified offshore drilling equipment, **AND ALSO**
- b) **To a depth not less than 20 m below seabed**,
OR
- c) **To a minimum of 3 m into competent limestone**,
whichever results in a **deeper total depth**.

3.1.2.3 If cavities, soft zones, or highly fractured limestone are encountered, drilling shall continue through these features until a competent rock mass is confirmed.





3.1.3 In-Situ Testing

3.1.3.1 Conduct **SPT at 1.5 m intervals** or at every change of strata

3.1.3.2 Perform **continuous NX rock coring** within reef limestone

3.1.3.3 Log:

- a) Cavities
- b) Hardness variation
- c) Groundwater/tidal influence
- d) Void zones and infill material

3.1.4 Sampling & Laboratory Testing

3.1.4.1 Soil (Coral Sands & Rubble)

- a) Moisture content
- b) Bulk density
- c) Grain size distribution
- d) Carbonate content
- e) Direct shear test (if sample integrity allows)

3.1.4.2 Rock (Reef Limestone)

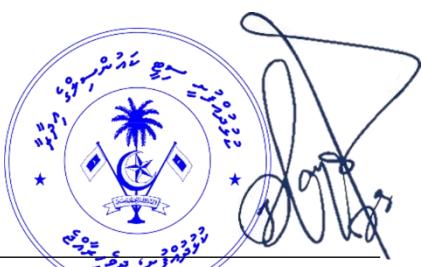
- a) Point Load Index
- b) Unconfined Compressive Strength (UCS), where core quality permits
- c) Rock Quality Designation (RQD) and recovery

3.1.4.3 Durability / Corrosion Tests

- a) pH
- b) Chloride content
- c) Sulphate content

3.2 Required Design Parameters (Outputs)

- a) Unit weight and friction angle (φ) for coral sands
- b) Cohesion (c) and modulus estimates (E_s, v)
- c) Rock mass properties (UCS, Point Load, RQD)
- d) End-bearing and shaft friction values for piles
- e) Recommended **rock socket depth**
- f) Axial and lateral pile capacity parameters
- g) Scour depth estimation and mitigation measures





3.3 Reporting Requirements

3.3.1 *Factual Report*

- a) Borehole logs, SPT results, core logs, core photographs
- b) Laboratory test results
- c) Bathymetry: charts, profiles, XYZ dataset
- d) Raw data in Excel / CSV format

3.3.2 *Interpretative Report*

- a) Geological and geotechnical model
- b) Recommended pile type, founding depth, and rock socket length
- c) Axial and lateral pile design parameters
- d) Scour and durability recommendations
- e) CAD drawings (DWG) of layout and geological sections

3.4 Health, Safety & Environmental Requirements

- a) Follow safe marine procedures suitable for reef-flat conditions
- b) Minimize disturbance to live coral and marine habitat
- c) Implement spill-prevention controls
- d) Monitor tides, waves, and weather with defined stop-work limits
- e) Ensure stable barge anchoring and safe personnel access
- f) Acquire permits (Council, Environmental etc.)





4. Detailed Architectural & Structural Drawings

4.1.1.1 Compile a full set of architectural and structural drawings as required for the implementation of the proposed fishing platform. The drawings shall adhere to the laws and regulations of the Maldives, including the Construction Administrative Regulation number 2019/R-1004.

4.1.1.2 Present the architectural concept to The Council for review before proceeding with the detailed design.

4.1.1.3 Present in person, the detailed drawings to The Council and have all comments addressed before finalizing the drawings.

4.1.1.4 Provide technical assistance in preparing tender documents required for project implementation.

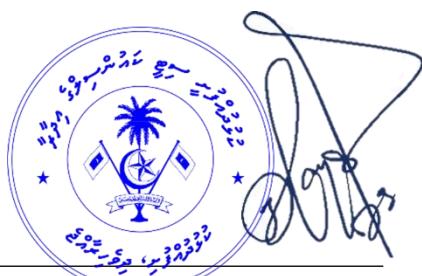
4.2 Architectural Requirements

- a) Access jetty length from shoreline: 150 meters
- b) Access jetty Width: 2 meters
- c) Fishing platform dimensions: 100 x 6 meters (to be positioned centered and perpendicular to the jetty)
- d) No railing required for the jetty
- e) Minimal walkway lighting (solar lights)
- f) Navigational aid beacons to be provided at the ends of the platform
- g) Lifebuoy holders to be placed along the platform and access jetty
- h) Platform to have a staircase a going down to a landing (within the platform boundary)

5. Bill of Quantities

5.1.1.1 Prepare a comprehensive Bill of Quantities (BoQ) with detailed breakdowns of all project elements in accordance with the finalized drawings set. The BoQ shall provide details of all the works, materials, required quality, and their quantities.

5.1.1.2 Provide a detailed Project Cost Estimation along with the completed BoQ.





6. Consultant Qualifications

- 6.1.1.1 Demonstrated experience with marine geotechnical investigations in the Maldives
- 6.1.1.2 Access to marine drilling rigs suitable for shallow reef conditions
- 6.1.1.3 Laboratory capability for carbonate soil and limestone testing
- 6.1.1.4 Personnel required:
 - a) Marine Geotechnical Engineer
 - b) Drilling Supervisor
 - c) Hydrographer
 - d) Laboratory Technicians
 - e) Architect
 - f) Structural Engineer

7. Deliverables

- a) Bathymetry dataset
 - i. XYZ + DWG
- b) Borehole logs (PDF + editable format)
- c) Laboratory test reports
- d) Geotechnical interpretative report (PDF + DOCX)
- e) Geological sections and layout drawings (DWG)
- f) Survey raw data (CSV / Excel)
- g) Full detailed drawing set — with valid stamps and signatures of the architectural and structural checkers (PDF + DWG)
- h) Structural calculations set (PDF + Excel)
- i) Architectural and structural checkers' valid certificates
- j) Checker's checklists
- k) Drawing Approval / Construction Permit Form — filled by architect and engineer
- l) Bill of Quantities (PDF + Excel)
- m) Detailed project cost estimate

