



Ministry of Environment

## **TERMS OF REFERENCE**

### **Geotechnical survey consultant – FIRM**

#### **A. BACKGROUND**

The Ministry of Environment (ME) on behalf of the Government of The Republic of Maldives is committed to improving waste management across Maldives. In particular, the Government recognizes that the management of waste at Thilafushi need to be addressed urgently, and is committed to identifying and implementing solutions. However, the scarcity of land in Maldives is one of the major challenges for the Government. To this regard the Government has completed a land reclamation project in Thilafushi. Future development of the reclaimed area depends on the geotechnical properties of the soil of the reclaimed land and the existing adjacent site that houses a landfill cell. To this end, the Ministry of Environment wishes to conduct a **geotechnical survey of the land area designated for the Waste to Energy facility** under the Greater Male Environment Improvement and Waste Management Project.

Since the bidders during tendering of the WtE plant are requested to define their specific requirements, another geotechnical survey will be, subject to these requirements, carried out in the course of the tendering.

#### **B. OBJECTIVES OF THE ASSIGNMENT**

The proposed area for tests to be conducted is shown in Figure 1 that is part of the master plan document, designated “Waste to Energy” (see attachment).



Yellow marked area  
20m spacing for SPT,  
starting from 5m from  
the boundary

Yellow shall indicate  
locations for dynamic  
probing to be carried  
out additionally

Locations are given  
indicatively only, exact  
location to be  
georeferenced during  
the probing

Figure 1: Test area plot on Thilafushi Island for geotechnical survey

The objectives of the assignment are:

- (i) Conducting Standard Penetration Test (SPT) with core drilling up to 25m conforming to the British Standards. The standards should be followed during spacing of the boring locations, depth at which other tests are done or samples for laboratory tests are taken from. The min spacing of the boreholes is 20m. The boring locations are to be finalized with the Client before the tests are undertaken. All locations shall be geo-referenced.
- (ii) Conducting Dynamic Probing (according to BS1377 or similar) to obtain an assessment of the penetration resistance of the substrata that can be related to discretely measured SPT values. The depth of the Dynamic Probing shall be assessed based on the substrata conditions. The costing shall be based on a depth of 20 m. The spacing shall be similar to that of the SPT boreholes. Locations that are provided in the lay-out below indicatively only shall be defined in due consultation with the Client. Locations shall be chosen to allow an interpolation of the substrata conditions between the SPT boreholes. All locations shall be geo-referenced.

- (iii) Standard Proctor Test of the proposed test area
- (iv) Direct Shear Test of the proposed test area
- (v) Geotechnical survey report highlighting
  - a. Soil profile investigation and grain size distribution
  - b. Methodology and test locations with appropriate drilling logs
  - c. Results, findings and limitations
  - d. The safe bearing capacity, uniaxial and unconfined compressive strengths at different depths
  - e. The consolidation effect of the proposed test area
  - f. Consultants recommendation on foundation design of buildings and structures based on the various geotechnical test findings

**C. SCOPE OF SERVICES**

1. A consulting firm (“the consultant”) specialized in geotechnical survey or surveying in general will carry out tasks to meet the objectives according the to the technical specification provided
2. The consultant will submit a report of their findings (2 hard copies colour printed and binded and soft copy in PDF format) showing the specified information as given in the objectives

**D. MINIMUM QUALIFICATION REQUIREMENTS**

The consultant shall demonstrate that they have equipment and personnel to carryout the required survey that is available for the full duration of the geotechnical survey. Interested consultants are expected to have the minimum resources specified below

**Personnel**

#	Staff	Qty
1	Chief surveyor (or equivalent)	1
2	Geotechnical Surveyors	5
3	Administrative staff	2

## Equipment

#	Equipment	Qty
1	Boring/drilling rig	1
2	Dynamic probing rig	1
3	SPT equipment	2
4	Standard proctor test apparatus	1

## E. EVALUATION CRITERIA

The proposal that will be taken up for evaluation would be those who have submitted all information regarding personal and equipment.

The proposals will be evaluated based on the criteria stated below.

Details	Weightage
1. Price	60
2. Duration	20
3. Personal*	20

\* Personal is further broken down as follows:

### 1. PRICE

Points for price will be given as follows:

$$= (\text{lowest proposed price} / \text{Bidders price}) * 60$$

### 2. DURATION

Points for duration will be given as follows:

$$= (\text{Shortest proposed duration} / \text{Bidders' duration}) * 20$$

### 3. PERSONAL

The proposed team should meet the qualifications set below. If they do they will be awarded full points and if not a zero will be given for the member of the team that does not meet the qualification criteria. And in such case, ministry has the right to request from the bidder for an alternate member.

#### 1. Chief Surveyor (1)

Must have Degree in related field and minimum 3 years of experience OR

Minimum 5 year of experience in related field

2. Geotechnical Surveyor (5)

Must have Diploma in related field and minimum 1 year of experience OR

Minimum 3 year of experience in related field

3. Admin (2)

Must have A'level/certificate and minimum 1 year of experience OR

Minimum 3 year of experience in related field

Post	Score
1. Chief Surveyor (score out of 10)	
2. Geotechnical Surveyor 1 (score out of 5)	
3. Geotechnical Surveyor 2 (Score out of 5)	
4. Geotechnical Surveyor 3 (Score out of 5)	
5. Geotechnical Surveyor 4 (Score out of 5)	
6. Geotechnical Surveyor 5 (Score out of 5)	
7. Admin Officer 1 (Score out of 5)	
8. Admin Officer 2(Score out of 5)	
<b>TOTAL SCORE OUT OF 40</b>	

Score for personal = Total score out of 40 \* 20/100

**Attachment:** Master Plan Greater Male Waste to Energy Project