



## **(Bills of Quantities)**

### **BILLS OF QUANTITIES FOR GROUND INVESTIGATION**

#### **Preamble**

1. In this Bill of Quantities the sub-headings and item descriptions identify the work covered by the respective items. The exact nature and extent of the work to be performed shall be ascertained by reference to the Conditions of Contract, the Specification and the Schedules and Appendices to the Specification, as appropriate. The rates and prices entered in the Bill of Quantities shall be deemed to be the full inclusive value of the work covered by the several items, including the following unless stated otherwise:
  - (a) Supervision, labour and all costs in connection therewith;
  - (b) The supply of materials, goods, storage, facilities and services, and all costs in connection therewith, including wastage and delivery to site;
  - (c) Plant and all costs in connection therewith;
  - (d) Fixing, erecting and installing or placing of materials and goods in position;
  - (e) All temporary works;
  - (f) All general obligations, requirements, liabilities and risks involved in the execution of the investigation as set forth or implied in the documents on which the tender is based;
  - (g) Establishment charges, overheads and profit;
  - (h) Bringing plant and sampling and in situ testing equipment to the site of each exploratory hole; erecting, dismantling and removing on completion;
  - (i) Removal of all equipment and services from site on completion.
2. All items not deleted from section A of the Bill of Quantities (General items and provisional sums) shall be priced and all items in subsequent sections against which quantities are entered shall be priced.
3. Professional attendance as specified in the Specifications associated with the description of cores and samples and other duties as required by the Contract shall be included in the appropriate rates.
4. The item for photographs shall allow for the standing time of associated plant, and supply of negative, prints and bound volume.
5. Rates for moving plant and equipment to the site of each exploratory hole shall allow for the formation of access routes, and making good access routes and working areas on completion as required by the Contract.
6. The rates for moving rotary drilling plant to the site of each hole shall include for setting up over a previously formed borehole.
7. Payment for forming exploratory holes shall be based on:
  - (a) full thickness of strata investigated and described in accordance with the Specification



- (b) depths measured from ground level
  - (c) depth measured from original ground level where an inspection pit has been excavated
  - (d) that part of a drill hole below the bottom of a borehole where a drill hole has been ordered to continue from the bottom of a borehole
  - (e) core recovery of at least 90% in any core run, unless the Project Manager is satisfied it cannot be achieved
  - (f) volume calculated as measured length x measured depth x specified width for trial and observation trenches
8. The rates for forming exploratory holes shall allow for:
- (a) casing installation were necessary, and removal
  - (b) dealing with surface water
  - (c) backfilling with arisings
  - (d) supply of daily report and preliminary log
  - (e) additional site supervision of non-accredited drillers
  - (f) disposal off site of excavated material not required for reuse
9. The rates for hourly provision of pitting and trenching crews and equipment at locations as directed by the Project Manager shall allow for compliance with the requirements of the Contract, including preparation of records.
10. The rates for sampling and in situ testing shall allow for the standing time of associated plant. Where in situ testing is paid for on an hourly basis, the time measured shall be the actual time taken to carry out the test in accordance with the Project Manager's instruction and/or the Specification but excluding the time taken to erect and dismantle test equipment where this is itemised separately.
11. The rates for installation of instruments shall allow for:
- (a) clearing and keeping hole free of unwanted materials
  - (b) all costs associated with equipment, installation, specified seals, surround and backfill materials excluding backfill below the instrument
  - (c) proving correct functioning
  - (d) delays due to installations
12. The rates for testing shall include for:
- (a) the supply of a copy of the preliminary test results to the Project Manager
  - (b) the cost of moisture content or density determinations where they form part of the test



13. The following abbreviations shall be used for the units of measurements:

Millimetres:	mm
Metre:	m
Kilometre:	km
Square millimetres:	mm <sup>2</sup>
Square metre:	m <sup>2</sup>
Cubic metre:	m <sup>3</sup>
Square metre per day:	m <sup>2</sup> /day
Kilogramme:	kg
Tonne:	t
Sum:	sum
Number:	nr
Hour:	hr
Week:	wk
Vehicle week:	v.wk
Item:	item
Day:	day
Specimen day:	sp.day



Item	Description	Unit	Quantity	Rate nis	Amount nis
<b>A</b>	<b>General items and provisional sums</b>				
A2.3	Mobilisation and demobilisation for the site work of Boreholes and CPT Works (phara ___ of BOQ.(including vessels, drilling rigs, etc.)  <b><u>The pricing of this item(A2.3) shall not be more than 5% of the total tender financial offer!</u></b>	sum	1		

Page total Section A carried to summary      nis .....



Item	Description	Unit	Quantity	Rate nis	Amount nis
<b>A</b>	<b>General items and provisional sums</b>				
A12	One master copy and three additional copies of the Factual report	sum	1		
A17.1	Photographs (marine site investigation)	nr	300		
A20	Sampling storage during the period	year	10		

**Page total Section A carried to summary      nis .....**



Item	Description	Unit	Quantity	Rate nis	Amount nis
<b>B</b>	<b>Boreholes/CPT Overwater</b>				
B1	Move overwater boring plant and equipment and CPT plant and equipment to the site of each exploratory hole and set up	nr	13		
B2	Advance overwater CPT between existing seabed level and 10m depth	m	130		
B3	As item B2 but between 10m and 20m depth	m	35		

**Total Section B carried to summary      nis .....**



Item	Description	Unit	Quantity	Rate nis	Amount nis
<b>C</b>	<b>Rotary drilling</b>				
	<b>Overwater</b>				
	<u>Drilling to obtain cores</u>				
C22	Rotary core drill overwater in hard strata to obtain cores of the specified diameter between seabed level and 10m depth	m	160		
C23	As item C22 but between 10m and 20m depth	m	35		

**Total Section C carried to summary**      nis .....

Item	Description	Unit	Quantity	Rate nis	Amount nis
<b>F</b>	<b>In situ testing</b>				
F1	Standard penetration test in marine borehole	nr	74		
F5	Vane shear strength test in marine borehole	nr	36		
F8	Hand vane test (set of three)	nr	36		

**Total Section F carried to summary**      nis .....



Item	Description	Unit	Quantity	Rate nis	Amount nis
<b>H</b>	<b>Laboratory testing</b>				
H1	<u>Classification</u>				
H1.1	Moisture content	nr	100		
H1.2	Liquid limit, plastic limit and plasticity index	nr	80		
H1.9	Particle size distribution by wet sieving	nr	100		
H1.11	Sedimentation by pipette/hydrometer	nr	50		
H4	<u>Compressibility, permeability, durability</u>				
H4.1	One-dimensional consolidation properties, at least 8 points/steps of loading	nr	25		
H4.2	Extra over item H4.1 for additional steps	steps	25		
H6	<u>Shear strength (total stress)</u>				
H6.2	Shear strength by hand vane	nr	50		
H6.4	Shear strength of a set of three minimum 60mm x 60mm square specimens by direct shear	nr	25		

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Item	Description	Unit	Quantity	Ratio	Amount
<b>H</b>	<b>Laboratory testing</b>				
H6.15	Undrained shear strength of a set of three 38 mm diameter specimens in triaxial compression without the measurement of pore pressure	nr	25		
H7	<u>Shear strength (effective stress)</u>				
H7.1	Consolidated undrained triaxial compression test with measurement of pore pressure change (set of three 38 mm diameter specimens)	nr	25		
H8	<u>Rock testing</u>				
H8.1	Natural water content of rock sample	nr	100		
H8.14	Uniaxial compressive strength	nr	25		
H8.19	Direct shear strength of a single specimen	nr	25		
H8.21	Determination of point load strength of rock specimen	nr	100		
H9	<u>Other testing</u>				
H9.1	Split, describe and photograph piston sample	nr	25		
H9.2	<u>Chemical/contamination tests:</u> <ul style="list-style-type: none"> <li>• Organic Matter Content</li> <li>• Carbonate Content Analyses</li> <li>• Salt Content</li> <li>• Methylene Blue Analyses</li> </ul>	nr	40		

Page total Section H carried forward nis \_\_\_\_\_



Item	Description	Unit	Quantity	Rate nis	Amount nis
<b>K</b>	<b>Geophysical Survey and Bathymetric Survey</b>				
K1	Geophysical Survey (Optional)	sum	1		
K2	Bathymetric Survey	sum	1		

Page total Section K carried to summary      nis \_\_\_\_\_



### Summary of Bill of Quantities

		<b>nis</b>
A	General items and provisional sums	
B	Boreholes/CPT	
C	Rotary drilling	
E	Sampling	
F	In situ testing	
H	Laboratory testing	
K	Geophysical Survey and Bathymetric Survey	
<b>Total tender</b>		

Signature: .....

Dated: .....

on behalf of: .....