

## REQUEST FOR QUOTATION (RFQ)

<b>Title</b>	<b>TO CONDUCT SOIL INVESTIGATION STUDY ON 85 ACRE LAND AT LEKIR BULK TERMINAL, MANJUNG, PERAK</b>			
<b>RFQ NO</b>	<b>IXB-RFQ2025-02</b>			
<b>Quotation Type</b>	<b>Open/Invited/Others: Open</b>			
<b>Submission/Information</b>	<b>ProcurementIBGroup@tnb.com.my</b>			
<b>Date Open</b>	<b>4 March 2025</b>	<b>Date Closed</b>	<b>12 March 2025</b>	<b>End Time</b> <b>12:00 noon</b>

GENERAL INFORMATION

ITEM	DESCRIPTION	
	<u>GENERAL INFORMATION</u>	
1	The Works contained in the BQ shall be include the provision of all labour, materials, plant, temporary or permanent works as required in the contract.	
2	The description for items in the BQ must be read in conjunction with the specifications unless otherwise stated:  a) MS 1056:2005 / b) MS 2038:2006 / BS 5930:2015 c) JKR/ SPJ/2013-S17	
3	The following abbreviations/ definitions/symbols are generally used in the JKHSI 2018 Document and shall be read as follows:-  a) m - meter b) m <sup>2</sup> - meter square c) m <sup>3</sup> - cubic metre d) kg - Kilogramme e) No - Number f) Lump sum - Lump Sum g) PEPC - Professional Engineer with Certificate h) P.Geol - Professional Geologist j) Flat Land - Flat and undulating land up to 25 degrees gradient and is generally accessible by road, e.g school field, playground, etc:  k) Hillslopes - Undulating or steep land where the gradient exceeds 25 degrees l) Floating platform - Where pontoon or similar facility is required as an operation platform over rivers, lake or near shore area m) Fixed platform - Where staging is required to be constructed as operation platform over rivers, lake, or near the shore n) Swampy ground - Naturally waterlogged swampy area p) Atterberg's limit - Liquid limit, plastic limit, linear shrinkage and plastic index are referred to as Atterberg's limit	
4	Designation of tests and exploratory holes in the Soil Investigation plan are TWELVE (12) numbers of boreholes.	

PROJECT :
<b>TO CONDUCT SOIL INVESTIGATION STUDY ON 85 ACRE LAND AT LEKIR BULK TERMINAL, MANJUNG, PERAK</b>

Summary of Bill of Quantities

Bill No.	Description of Works	Amount (RM)
1	General Condition and Preliminaries	
2	Deep Boring	
3	Cone Penetration Test	
4	Field Tests	
5	Laboratory Testing	
7	Instrumentation	
8	Report	
Grand Total		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
1	<u>CONTRACTUAL REQUIREMENTS</u>				
1.1	Insurance <ul style="list-style-type: none"> <li>i) Insurance of Works</li> <li>ii) Public Liability Insurance</li> <li>iii) SOCSO/Workmen Compensation Insurance</li> </ul>				
1.2	Engineer's Requirements				
1.2.1	Submission of Documents <ul style="list-style-type: none"> <li>i) Work Programme (i.e. Microsoft Project)</li> <li>ii) Method of Statement</li> </ul>				
1.3	Project Requirements				
1.3.1	Access to the site				
1.3.2	Survey and Setting out <ul style="list-style-type: none"> <li>i) Provision of Licensed Land Survey for the purpose of setting out of for both road or building project whereby the Engineer's cannot determine any levels, boundary story and any other point reference which are required for the executive of the works as directed and certified by the Engineer. The survey including coordinate of borehole, MP etc (all point) in cassini soldner format and rectified skewed Orthomorphic (RSO) format, level formation, reduce level and as-build drawing.</li> </ul>	lump sum	1		
1.3.3	Utilities Detection <ul style="list-style-type: none"> <li>i) To detect and mark all utilities and services for testing locations as shown in drawings</li> <li>ii) Verification with utilities provider. Rate to include purchase of necessary document and verification on the utilities detected as compared with the records of the utilities provider</li> </ul>				
1.3.4	Water and Electricity Supply <ul style="list-style-type: none"> <li>i) Provide an adequate power and water supplies for execution of the works including paying all associated cost and fees as directed.</li> </ul>				
1.3.5	Keeping Site Clean and Tidy <ul style="list-style-type: none"> <li>i) Remove all debris; rubbish and waste from the site and keep the working area clean all the time during construction period</li> </ul>				
1.3.6	Cleaning Site Upon Completion <ul style="list-style-type: none"> <li>i) Allow for clearing away accumulated rubbish, cleaning and making good on completion during the progress of works and before handing over as specified.</li> </ul>				
To Collection (Page BQ 1/1)					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
1.4	Authorities Requirement				
1.4.1	Compliance With The Law/OSHA or other Statutory Requirement				
	i) Comply in all respect (including the giving of all notices and the paying of all fees required) with any law, regulation or by-law, or any order or directive issued by any public authority or public services company relating to the work or, in the case of public authority or public service company with those system the same area or will be connected.				
1.5	Contractor's Requirements Supervision				
1.5.1	i) Provision of Professional Engineer with Certificate (PEPC)/Professional Geologist (P.Geol) for monitoring and supervise on site/laboratory including endorse the SI report.				
1.6	Traffic & Safety Management				
1.6.1	Allow for expenditure in complying with local authorities' requirement for traffic and safety management per borehole location				
1.7	Protection of Existing Infrastructure				
1.7.1	The contractor shall provide and maintain all necessary temporary track, staging, roads, culvert etc. for access within site to borehole location as specified.	lump sum	1		
1.8	Competent Engineer(s)				
1.8.1	Provide a Competent Engineer(s) who has a valid competency Certificate issued by the office of the Energy Commission of Malaysia for receiving Permit To Works.				
	i) Maximum 2 site visit or meeting	lump sum	1		Rate Only
	ii) Maximum 4 site visit or meeting	lump sum	1		Rate Only
	iii) Maximum 6 site visit or meeting	lump sum	1		Rate Only
1.9	Project Safety Requirement (PSAFE)				
1.9.1	The items where applicable, shall cover the following: -				
	a) To provide a full-time Site Safety Supervisor (SSS) registered with Department of Occupational Safety And Health (DOSH) at project site for the whole duration of the Contract.				
	b) To provide workers, subcontractors, vendors, specialist or any other personnel payment for levy to CIDB with CIDB training and they shall possess valid CIDB for the whole duration they are working in TNB premises				
	c) To provide Safety Posters / Signages and the necessary safety gear such as safety helmets, first aid kits, safety boots, etc., for the exclusive use of the Engineer and his representatives and visitors to site. The items are to be kept and maintained by the contractor.				
	d) To comply with the legal and other requirement pertaining to Occupational Safety and Health in Malaysia.	lump sum	1		
To Collection Page (BQ 1/2)					
			Collection	Page BQ 1/1	
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Total for Bill No. 1 to Summary					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
2	<b><u>Deep Boring</u></b> Notes: Rate to include ground water observation				
2.1	<b><u>Mobilisation and Demobilisation</u></b>  Mobilisation of boring plant and all equipments to the site including transfer between different location within the site, handling, assembling and demobilisation upon completion.	lump sum	1		
2.2	<b><u>Pontoon</u></b>				
2.2.1	<b><u>Drum Pontoon</u></b>				
a	Provide and install a complete set of drum pontoon including all necessary works to the suitable depth of water and uninstall upon completion. Rate to include mobilization and demobilation.	lump sum			Rate Only
	<b><u>Jack-up Pontoon</u></b>				
b	Provide and install a complete set of drum pontoon including all necessary works to the suitable depth of water and uninstall upon completion. Rate to include mobilization and demobilation.	lump sum			Rate Only
c	Provision of tug boat and small passenger boat for an access	day			Rate Only
2.3	<b><u>Plant Movement</u></b> shifting of plant and equipment from one borehole position to the next borehole position, rate to include dismantling from one position and erecting at another position where the borehole is to be carried out on :				
a.	flat Land	No	11		
b.	Hillslopes	No			Rate Only
c.	Floating Plattform				
i:	With drum pontoon	No			Rate Only
ii:	With jack up pontoon	No			Rate Only
d.	Fixed Plattform	No			Rate Only
e.	Swampy Ground				
i:	With Staging	No			Rate Only
f.	Jungle	No			Rate Only
To Collection (Page BQ 2/1)					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
2.4	<b><u>Boring In Soil</u></b>				
2.4.1	Carrying out vertical boring in soil using boring equipment- (NW size) for depth measured from commencing Surface using suitable drilling medium. Rate to include provision of casing where necessary.				
	a. Not exceeding 10m	m	120		
	b. Ditto exceeding 10m but n.e 20m	m	120		
	c. Ditto exceeding 20m but n.e 30m	m	120		
	d. Ditto exceeding 30m but n.e 40m	m	120		
	e. Ditto exceeding 40m but n.e 50m	m	120		
	f. Ditto exceeding 50m	m	120		
2.5	<b><u>Drilling In Rock</u></b>				
	Carry out vertical diamond core drilling of (52mm) diameter into rock including storing of core samples in standard boxes.				
	<b>a. Water (as drilling fluid)</b>				
	i. Not exceeding 10m	m			Rate Only
	ii. Ditto exceeding 10m but n.e 20m	m			Rate Only
	iii. Ditto exceeding 20m but n.e 30m	m			Rate Only
	iv. Ditto exceeding 30m but n.e 40m	m			Rate Only
	v. Ditto exceeding 40m but n.e 50m	m			Rate Only
	vi. Ditto exceeding 50m	m			Rate Only
	<b>b. Reaming casing</b>				
	i. Not exceeding 10m	m			Rate Only
	ii. Ditto exceeding 10m but n.e 20m	m			Rate Only
	iii. Ditto exceeding 20m but n.e 30m	m			Rate Only
	iv. Ditto exceeding 30m but n.e 40m	m			Rate Only
	v. Ditto exceeding 40m but n.e 50m	m			Rate Only
	vi. Ditto exceeding 50m	m			Rate Only
To Collection (Page BQ 2/2)					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
2.6	<b><u>TEST</u></b>				
2.6.1	<b>Standard Penetration test</b>				
	a. Not exceeding 10m	No	75		
	b. Ditto exceeding 10m but n.e. 20m	No	75		
	c. Ditto exceeding 20m but n.e. 30m	No	75		
	d. Ditto exceeding 30m but n.e. 40m	No	75		
	e. Ditto exceeding 40m but n.e. 50m	No	75		
	f. Ditto exceeding 50m	No	75		
2.6.2	<b>Vane shear test</b>				
	a. Not exceeding 10m	No	12		
	b. Ditto exceeding 10m but n.e. 20m	No	12		
	c. Ditto exceeding 20m but n.e. 30m	No	12		
	d. Ditto exceeding 30m but n.e. 40m	No	12		
	e. Ditto exceeding 40m but n.e. 50m	No	12		
	f. Ditto exceeding 50m	No			Rate Only
2.6.3	<b>Pressure meter test</b>				
	a. Not exceeding 10m	No			Rate Only
	b. Ditto exceeding 10m but n.e. 20m	No			Rate Only
	c. Ditto exceeding 20m but n.e. 30m	No			Rate Only
	d. Ditto exceeding 30m but n.e. 40m	No			Rate Only
	e. Ditto exceeding 40m but n.e. 50m	No			Rate Only
	f. Ditto exceeding 50m	No			Rate Only
2.6.4	<b>Field permeability test</b>				
	a. Not exceeding 10m	No			Rate Only
	b. Ditto exceeding 10m but n.e. 20m	No			Rate Only
	c. Ditto exceeding 20m but n.e. 30m	No			Rate Only
	d. Ditto exceeding 30m but n.e. 40m	No			Rate Only
	e. Ditto exceeding 40m but n.e. 50m	No			Rate Only
	f. Ditto exceeding 50m	No			Rate Only
To Collection (Page BQ 2/3)					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
2.6.5	<b>Dynamic cone test</b>				
	a. Not exceeding 10m	No			Rate Only
	b. Ditto exceeding 10m but n.e. 20m	No			Rate Only
	c. Ditto exceeding 20m but n.e. 30m	No			Rate Only
	d. Ditto exceeding 30m but n.e. 40m	No			Rate Only
	e. Ditto exceeding 40m but n.e. 50m	No			Rate Only
	f. Ditto exceeding 50m	No			Rate Only
2.7	<b>Sampling</b>				
	Carry out the following sampling in borehole including transportation and protection as per Specification				
	a. Disturbed samples				
	i: Not Exceeding 10 m	No	72		
	ii. Ditto exceeding 10m but n.e 20m	No	72		
	iii. Ditto exceeding 20m but n.e 30m	No	72		
	iv. Ditto exceeding 30m but n.e 40m	No	72		
	v. Ditto exceeding 40m but n.e 50m	No	72		
	vi. Ditto exceeding 50m	No			Rate Only
	b. Undisturbed sample using thin wall tube sampler				
	i: Not Exceeding 10 m	No	12		
	ii. Ditto exceeding 10m but n.e 20m	No	12		
	iii. Ditto exceeding 20m but n.e 30m	No	12		
	iv. Ditto exceeding 30m but n.e 40m	No	12		
	v. Ditto exceeding 40m but n.e 50m	No	12		
	vi. Ditto exceeding 50m	No			Rate Only
	c. Undisturbed sample using Mazier sampler				
	i: Not Exceeding 10 m	No			Rate Only
	ii. Ditto exceeding 10m but n.e 20m	No			Rate Only
	iii. Ditto exceeding 20m but n.e 30m	No			Rate Only
	iv. Ditto exceeding 30m but n.e 40m	No			Rate Only
	v. Ditto exceeding 40m but n.e 50m	No			Rate Only
	vi. Ditto exceeding 50m	No			Rate Only
To Collection (Page BQ 2/4)					



ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
	d. Undisturbed sample using piston sampler				
	i. Not Exceeding 10 m	No			Rate Only
	ii. Ditto exceeding 10m but n.e 20m	No			Rate Only
	iii. Ditto exceeding 20m but n.e 30m	No			Rate Only
	iv. Ditto exceeding 30m but n.e 40m	No			Rate Only
	v. Ditto exceeding 40m but n.e 50m	No			Rate Only
	vi. Ditto exceeding 50m	No			Rate Only
	e. Undisturbed sample using Denison sampler				
	i. Not Exceeding 10 m	No			Rate Only
	ii. Ditto exceeding 10m but n.e 20m	No			Rate Only
	iii. Ditto exceeding 20m but n.e 30m	No			Rate Only
	iv. Ditto exceeding 30m but n.e 40m	No			Rate Only
	v. Ditto exceeding 40m but n.e 50m	No			Rate Only
	vi. Ditto exceeding 50m	No			Rate Only
	f. Water Sample (minimum 1 litre)				
	i: Not Exceeding 10 m	No	12		
	ii. Ditto exceeding 10m but n.e 20m	No			Rate Only
	iii. Ditto exceeding 20m but n.e 30m	No			Rate Only
	iv. Ditto exceeding 30m but n.e 40m	No			Rate Only
	v. Ditto exceeding 40m but n.e 50m	No			Rate Only
	vi. Ditto exceeding 50m	No			Rate Only
2.8	<b>Miscellaneous</b> Borehole marker with concrete base 300mm x 300mm x 200mm with PVC pipe 50mm diameter for every borehole until minimum depth of 0.5m. The marking of the bore hole must be clear labelled,coloured and permanent ( at PVC and/or concrete base).	No	12		
To Collection (Page BQ 2/5)					

Collection	Page BQ 2/1	
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Total for Bill No. 2 to Summary		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
3.1	<u>CONE PENETRATION TEST</u>				
3.1	<b>Mobilisation and Demobilisation</b> Mobilisation of plants and equipments to the site and demobilisation upon completion (20 tonnes)				
	a. Up to 25 km from contractor's office	lump sum			Rate Only
	b. Over 25 Km and up to 125 km from contractor's office	lump sum			Rate Only
	c. Over 125 Km and up to 225 km from contractor's office	lump sum			Rate Only
	d. Over 225 Km and up to 325 km from contractor's office	lump sum			Rate Only
	e. Over 325 Km and up to 425 km from contractor's office	lump sum			Rate Only
	f. Over 425 Km and up to 525km from contractor's office	lump sum			Rate Only
	g. Over 525km from contractor's office	lump sum			Rate Only
3.2	<b>Plant Movement</b>				
3.2.1	Shifting of plan and equipment from one borehole position to the next borehole.				
	a. Flat Land	No			Rate Only
	b.Hillslopes	No.			Rate Only
	c. Floating Platform - with drum pontoon	No.			Rate Only
	d. Fixed Platform	No.			Rate Only
	e. Swamp ground - with staging	No.			Rate Only
	f. Jungle	No.			Rate Only
3.3	<b>Test</b>				
3.3.1	<b>Deep sound test</b>				
	a. Not exceeding 10 m.	m			Rate Only
	b. Ditto exceeding 10 m but n.e 20 m	m			Rate Only
	c. Ditto exceeding 20 m but n.e 30 m	m			Rate Only
	d. Ditto exceeding 30 m but n.c. 40 m	m			Rate Only
	e. Ditto exceeding 40 m but n.e 50 m	m			Rate Only
	f. Ditto exceeding 50 m	m			Rate Only
To Collection (Page BQ 3/1)					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
3.3.2	Friction reducer to deep sounding test	No			Rate Only
3.3.3	<b>Piezocone</b>				
	a. Not exceeding 10 m	m			Rate Only
	b. Ditto exceeding 10 m but n.e 20 m	m			Rate Only
	c. Ditto exceeding 20 m but n.e 30 m	m			Rate Only
	d. Ditto exceeding 30 m but n.e 40 m	m			Rate Only
	e. Ditto exceeding 40 m but n.e 50 m	m			Rate Only
	f. Ditto exceeding 50 m	m			Rate Only
3.3.4	Dissipation Test (maximum of 2hours)				
	a. Not exceeding 10 m	m			Rate Only
	b. Ditto exceeding 10 m but n.e 20 m	m			Rate Only
	c. Ditto exceeding 20 m but n.e 30 m	m			Rate Only
	d. Ditto exceeding 30 m but n.e 40 m	m			Rate Only
	e. Ditto exceeding 40 m but n.e 50 m	m			Rate Only
	f. Ditto exceeding 50 m	m			Rate Only
3.4	<b>Miscellaneous</b>				
3.4.1	Test market with concrete base 300mm x 300mm x 200mm with PVC pipe 50mm diameter for every borehole until minimum depth of 0.5m. The marking of the borehole must be clear labelled, coloured and permanent (at PVC pipe and/or concrete base)	No			Rate Only
To Collection (Page BQ 3/2)					

Collection	Page BQ 3/1	
	Page BQ 3/2	
Total for Bill No. 3 to Summary		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
4	<b><u>FIELD TEST</u></b>				
4.1	<b>Mobilisation and Demobilisation</b>				
	Mobilisation of personnel and equipment to site and demobilisation upon completion				
	a. Up to 25km from contractor's office	lump sum			Rate Only
	b. Over 25km and up to 225km from contractor's office	lump sum			Rate Only
	c. Over 225km and up to 425km from contractor's office	lump sum			Rate Only
	d. Over 425km from contractor's office	lump sum			Rate Only
4.2	<b><u>Hand Auger</u></b>				
	Rate for augering in soil shall be deemed to include ground water observation as per Specification				
4.2.1	Augering in soil				
	a. Not exceeding 2.5m	m			Rate Only
	b. Exceeding 2.5-5m	m			Rate Only
	c. exceeding 5m-7.5m	m			Rate Only
4.2.2	Disturbed sample	No			Rate Only
4.2.3	Undisturbed samples using thin wall tube sampler	No			Rate Only
4.2.4	Water sample (min . 1 litres)	No			Rate Only
4.3	<b><u>Trial Pit</u></b>				
	Rate for sampling shall be deemed to include transportation and protection as per specification				
4.3.1	Pit size( 2m x 2m x 2m) including excavation, lateral support, barricade, temporarily covered, logging and mapping of side wall and backfilling, and ground water observation as per specification	No			Rate Only
4.3.2	Small disturbed sample.	No			Rate Only
4.3.3	Bulk sample	No			Rate Only
4.3.4	Block sample (300 mm x 300 mm x 300 mm)	No			Rate Only
4.3.5	Water sample (min 1 litres)	No			Rate Only
To Collection (Page BQ 4/1)					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
4.4	<b>Testing</b>				
4.4.1	Mackintosh or JKR Probe test to depth not exceeding 15m below ground level or 400 blows per 0.30m penetration whichever achieved first.	No			Rate Only
4.4.2	Penetration Vane shear test.				
	a. Not exceeding 10 m	m			Rate Only
	b. Ditto exceeding 10 m but n.e. 20 m	m			Rate Only
	c. Ditto exceeding 20 m but n.e. 30 m	m			Rate Only
	d. Ditto exceeding 30 m but n.e. 40 m	m			Rate Only
	e. Ditto exceeding 40 m but n.e. 50 m	m			Rate Only
	f. Ditto exceeding 50 m.	m			Rate Only
4.4.3	Plate bearing test	No			Rate Only
4.4.4	In situ califonia Bearing Ratio (CBR) at locations as shown in drawings	No			Rate Only
4.4.5	Dynamic Cone Penetration Test (DCP)				
	a. Carry out 150mm diameter pavement coring	No			Rate Only
	b. Dynamic Cone Penetration Test in pavement cored hole through the base course (crusher run),sub base - and sub -grade up to 1.2m below the road surface	No			Rate Only
	c. Re-instate cored hole with bituminous premix or approved material	No			Rate Only
To Collection (Page BQ 4/2)					
			Collection	Page BQ 4/1	
				Page BQ 4/2	
Total for Bill No. 4 to Summary					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
5.0	<u>Laboratory Test</u> All laboratory test shall consists of rock/soil/water samples as directed by				
5.1	<b><u>Classification Test</u></b>				
	a. Moisture Content	No	210		
	b. Atterberg limits	Set	210		
	c. Bulk Density Test	No	210		
	d. Brightness Test	No			Rate Only
	e. Dry Density Test	No	210		
	f. Specific Gravity (pycnometer)	No	210		
	g. Particle size distribution for fine-grained soils. (hydrometer)	No	210		
	h. Particle size distribution for coarse-grained soils	No	210		
5.2	<u>Soil Strength Test (Each set shall consist of 3 nos. of undisturbed specimen)</u>				
	a. Unconfined compressive strength	No	24		
	b. Unconsolidated undrained triaxial (U.U) compression without pore water pressure	set	24		
	c. Unconsolidated undrained triaxial (U.U) compression with pore water pressure measurement	set			Rate Only
	d. Consolidated undrained triaxial (C.I.U) compression test with pore water pressure measurement	set	24		
	e. Consolidated drained triaxial (C.D) compression test with pore water pressure measurement.	set			Rate Only
	f. (60mm square) direct shear box test	set			Rate Only
	g. (100mm square) direct shear box test	set			Rate Only
	h. (300mm square) direct shear box test	set			Rate Only
	j. (60mm square) multi-reversal shear box test	set			Rate Only
	k. (100mm square) multi-reversal shear box test	set			Rate Only
	l. Pilcon hand Vane Tests.	No			Rate Only
5.3	<b><u>Soil Compaction Related Test (Each set shall consist of 5 nos. of specimen)</u></b>				
	a. Standard Compaction (2.5 kg hammer).	set			Rate Only
	b. Heavy compaction (4.5 kg hammer).	set			Rate Only
	c. Vibrating hammer	set			Rate Only
	d. Unsoaked Carlifornia Bearing Ratio (CBR) (on both ends)	No			Rate Only
	e. Soaked Carlifornia Bearing Ratio (CBR) (on both ends)	No			Rate Only
To Collection (Page BQ 5/1)					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
5.4	<b><u>Chemical and Electro-chemical Tests</u></b>				
	a. Organic matter content.	No	30		
	b. Loss on ignition.	No			Rate Only
	c. Total sulphate content (for water & soil)	No			Rate Only
	d. Sulphate content	No	24		
	e. Chloride content.	No			Rate Only
	f. pH value.	No	12		
	g. Contaminants.	No			Rate Only
	h. Carbonate Content				
	i. Water/Soil Sample	No			Rate Only
	ii. Rock Sample	No			Rate Only
	j. Acid Test for Rock	No			Rate Only
5.5	<b><u>Rock Test</u></b>				
	a. Unconfined compressive strength (U.C.S)	No			Rate Only
	b. Unconfined compressive strength (U.C.S) with Young's modulus and Poisson's ratio measurement.	No			Rate Only
	c. Point Load Test	No			Rate Only
	d. Petrographic analysis	No			Rate Only
	e. Splitting Tensile Strength	No			Rate Only
	f. Direct Tensile Strength	No			Rate Only
	g. Brazilian Tensile Strength	No			Rate Only
	<b><u>Compressibility Test (SOIL)</u></b>				
	a. One-dimensional consolidation (1-D)	No	30		
5.6	<b><u>Permeability Test</u></b>				
	a. Falling head	No			Rate Only
5.7	b. Constant head	No			Rate Only
<b>To Collection (Page BQ 5/2)</b>					

Collection	Page BQ 5/1	
	Page BQ 5/2	
<b>Total for Bill No. 5 to Summary</b>		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
7	<u>INSTRUMENTATION</u> Geotechnical instrumentation shall be deemed to include transportation				
7.1	Pneumatic piezometer as approved by Engineer				
	a. Not exceeding 10 m	No			Rate Only
	b. Ditto exceeding 10 m but n.e 20 m	No			Rate Only
	c. Ditto exceeding 20 m but n.e 30 m	No			Rate Only
	d. Ditto exceeding 30 m but n.e 40 m	No			Rate Only
	e. Ditto exceeding 40 m but n.e 50	No			Rate Only
	f. Ditto exceeding 50 m	No			Rate Only
7.2	Standpipe Piezometer as approved by Engineer				
	a. Not exceeding 10 m	No			Rate Only
	b. Ditto exceeding 10 m but n.e 20 m	No			Rate Only
	c. Ditto exceeding 20 m but n.e 30 m	No			Rate Only
	d. Ditto exceeding 30 m but n.e 40 m	No			Rate Only
	e. Ditto exceeding 40 m but n.e 50	No			Rate Only
	f. Ditto exceeding 50 m	No			Rate Only
7.3	Inclinometer as approved by Engineer				
	a. Not exceeding 10 m	No			Rate Only
	b. Ditto exceeding 10 m but n.e 20 m	No			Rate Only
	c. Ditto exceeding 20 m but n.e 30 m	No			Rate Only
	d. Ditto exceeding 30 m but n.e 40 m	No			Rate Only
	e. Ditto exceeding 40 m but n.e 50	No			Rate Only
	f. Ditto exceeding 50 m.	No			Rate Only
7.4	Ground settlement marker (GSM) as approved by S.O	No			Rate Only
7.5	Building settlement marker (BSM) as approved by S.O	No			Rate Only
7.6	Settlement plate as approved by S.O	No			Rate Only
7.7	Settlement displacement marker as approved by S.O.	No			Rate Only
7.8	Tiltmeter on structure including reference plate securely bonded or bolted as per Specification	No			Rate Only
7.9	Monitoring and reading related instrument (collection of data ,analysis and verification )				
	a. every week	trip			Rate Only
	b.twice a month	trip			Rate Only
	c.once a month	trip			Rate Only
<b>Total for Bill No.7 to Summary</b>					



ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
8	<u>REPORT</u>				
8.1	<u>Final Report</u>				
8.1.1	To submit four (4) sets of soil investigation report which include laboratory test result in hardcopy with comb binding. The report shall be endorsed by PEPC/P. Geol	lump sum	1		
8.1.2	To submit one (1) copies of CD for following item below: a. Full report in PDF Report b. Field work summary template including coordinates in MS Excel Format c. Photos for all field test complete with coordinates and dates (JPEG) format d. As-built drawing in Autocad format e. Others reference stated in Terms of Reference (TOR) SI as directed by the Engineer (if any)	lump sum	1		
8.1.3	Seismic Refraction Survey Report  Seismic Refraction Survey Report as per Designer's requirement to be submitted in six (6) set with comb binding and six (6) CD's. Rate to be include geological section and interpretation of data by PEPC/P. Geol	lump sum			Rate Only
8.1.4	Multi chanel Analysis of Surface Wave (MASW) Survey report  Multi chanel Analysis of Surface Wave (MASW) Survey Report as per per Designer's requirement to be submitted in six (6) set with comb binding and six (6) CD's. Rate to be include geological section and interpretation of data by PEPC/P. Geol	lump sum			Rate Only
8.1.5	Parellel Seismic Logging Report  Parellel Seismic Logging Report as per per Designer's requirement to be submitted in six (6) set with comb binding and six (6) CD's. Rate to be include subsurface profile of logging image endorsed by PEPC/P. Geol	lump sum			Rate Only
8.1.6	Electrical Resistivity Profiling Report  Electrical Resistivity Profiling Report Parellel Seismic Logging Report as per per Designer's requirement to be submitted in six (6) set with comb binding and six (6) CD's. Rate to be include 2D & 3D subsurface profile based on data obtained from Electrical Resistivity Survey and incorporating borehole data where available endorsed by PEPC/P. Geol	lump sum			Rate Only
8.1.7	Gravity Imaging Report  Gravity Imaging Report as per per Designer's requirement to be submitted in six (6) set with comb binding and six (6) CD's. Rate to be include subsurface profile based on data obtained from Gravity data acquisition and incorporating borehole data where available endorsed by PEPC/P. Geol	lump sum			Rate Only
To Collection (Page BQ 8/1)					320.00

#REF!

APPENDIX: BOREHOLE LAYOUT

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT (RM)
8.1.8	Geological Terrain Mapping  Geological Terrain Mapping as per Designer's requirement to be submitted in six (6) set with comb binding and six (6) CD's. The report shall be endorsed by PEPC/P. Geol	lump sum			Rate Only
8.1.9	Engineering Geological Mapping Report  Engineering Geological Mapping Report as per Designer's requirement to be submitted in one (1) set with comb binding and six (6) CD's. Rate to be include geological section and interpretation of data by PEPC/P. Geol	lump sum			Rate Only
8.1.10	Instrumentation Report a. To provide interim monitoring report as requested by the Engineer	lump sum			Rate Only
	b. To submit final report inclusive analyse, findings, coordinates with date and conclusions in three (3) sets of hardcopy/softcopy and shall endorsed by PEPC/P. Geol. Report shall include as-built drawing endorsed by Licensed Land Surveyor.	lump sum			Rate Only
To Collection (Page BQ 8/2)					

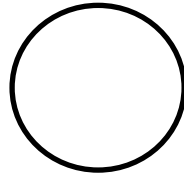
Collection	Page BQ 8/1	
	Page BQ 8/2	
Total for Bill No. 8 to Summary		

***Signed by Company's authorised representative***

**Name** :

**Position** :

**Date:** :



Company Stamp:

APPENDIX: BOREHOLE LAYOUT

