JADUAL KADAR HARGA
KERJA-KERJA PENYIASATAN TAPAK
TAHUN 2018

PANDUAN KEGUNAAN

KEGUNAAN

1. Kadar-kadar harga di dalam Jadual Kadar Harga ini tidak sekali-kali boleh digunakan untuk mengira harga bagi Kerja-kerja Perubahan atau Tuntutan di dalam mana-mana kontrak yang berasaskan Senarai Kuantiti atau Pelan dan Spesifikasi.

2. Jika terdapat butir-butir kerja yang kadarnya tidak terdapat di dalam Jadual Kadar Harga ini, harga persetujuan bolehlah digunakan dengan syarat jumlah nilai kerja berasaskan harga persetujuan ini tidak melebihi 30% daripada harga asal kerja `Soil Investigation' (SI) (harga asal ini tidak termasuk harga yang berasaskan harga persetujuan). Jika harga persetujuan ini melebihi 30% daripada harga asal kerja 'Soil Investigation', kerja ini hendaklah dipanggil secara sebutharga.

ITEM	DESCRIPTION
A	**GENERAL INFORMATION**
1	The Works contained in the JKHSI 2018 shall be include the provision of all labour, materials, plant, temporary or permanent works as required in the contract.
2	The description for item in the BQ must be read in conjunction with the specifications. All test are referred to MS 1056:2005 / BS 1377:1990 and MS 2038:2006 / BS 5930:2015 and JKR/ SPJ/2013-S17 unless othewise stated: a) MS 1056:2005 / BS 1377:1990 b) MS 2038:2006 / BS 5930:2015 c) JKR/ SPJ/2013-S17
B	**ABBREVIATIONS/DEFINITION**
1	The following abbreviations/ definntions/symbols are generally used in the JKHSI 2018 Document and shall be read as follows :-

a)	m	-	metre
b)	m2	-	metre square
c)	m3	-	cubic metre
d)	kg	-	Kilogramme
e)	No	-	Number
f)	Sum	-	sum
g)	S.O		Superitendant Officer
h)	PEPC	-	Profesional Engineer with Certificate
j)	P.Geol	-	Professional Geologist
k)	Flat Land	-	Flat and undulating land up to 25 degrees gradient and is generally accesible by road, e.g school field, playground, etc:
l)	Hillslopes	-	Undulating or steep land where the gradient exceeds 25 degrees
m)	Floating platform	-	Where pontoon or similar facility is required as an operation platform over rivers, lake or near shore area
n)	Fixed platform	-	Where staging is required to be constructed as operation platform over rivers, lake, or near the shore
p)	Swampy ground	-	Naturally waterlogged swampy area
q)	Atterberg's limit	-	Liquid limit, plastic limit, linear shrinkage and plastic index are referred to as Atterberg's limit
r)	Particle size distribution for fine - grained soil	-	Method to be choosen by designer's either pippette method or hydrometer method.
s)	Particle size distribution for course- grained soil	-	Method to be choosen by designer's either wet sieving or dry sieving.

BILL NO. 1 : GENERAL ITEMS

Item	Description	Unit	Rate JKHSI 2018 (RM)
1	**CONTRACTUAL REQUIREMENTS**		
	1.1 Insurances		
	i) Insurance of Works		
	ii) Public Liability Insurance		
	iii) SOCSO/Workmen Compensation Insurance		
	1.2 So's Requirements		
	1.2.1 Submission of Documents		
	i) Work programme (i.e microsoft project)		
	1.3 Project Requirements		
	1.3.1 Access to the site		
	1.3.2 Survey and Setting Out		
	i) Provision of Licensed Land Survey for the purpose of setting out of for both road or building project whereby the SO cannot determine any levels, boundary story and any other point reference which are required for the execution of the works as directed and certified by the SO. 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.		
	1.3.3 Utilities Detection		
	i) To detect and mark all utilities and services for testing locations as shown in drawings.		
	ii) Verification with utilities provider. Rate to include purchase of necessary documents and verification on the utilities detected as compared with the records of the utilities provider.	LS	
	1.3.4 Water and Electricity Supply		
	i) Provide an adequate power and water supplies for the execution of the Works including paying all associated cost and fees as directed.		
	1.3.5 Keeping Site Clean and Tidy		
	i) Remove all debris; rubbish and waste from the site and keep the working area clean all the time during construction period.		14%
	1.3.6 Cleaning of Site Upon Completion		of SI works (excluding preliminaries)
	i) Allow for clearing away accumulated rubbish, cleaning and making good on completion during the progress of Works and before handling over as specified.		
	1.4 Authorities' Requirements		
	1.4.1 Compliance With The Law/OSHA or other Statuory Requirements		
	i) Comply in all respects (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		
	1.5.1 Supervision		
	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**	LS	
	a. The contractor shall provide and maintain all necessary temporary track, staging, roads, culvert et cetera for access within site to borehole location as specified. The contractor shall maintain and protect against damage of existing infrastructure throughout construction period. the contractor shall make good any above item damage by any work carried out by him.		**3%** of SI works(excluding preliminaries)

BILL NO. 2 : DEEP BORING

Item	Description	Unit	Rate JKHSI 2018 (RM)
2	**DEEP BORING** Notes : Rate to include ground water observation		
2.1	**Mobilisation and Demobilisation** Mobilisation of boring plant and all equipments to the site including transfer between different location within the site, handling, assembling and demobilisation upon completion.		
	a. Up to 25km from contractor's office	sum	**1,850.00**
	b. Over 25km and up to 75km from contractor's office	sum	**3,380.00**
	c. Over 75km and up to 125km from contractor's office	sum	**4,140.00**
	d. Over 125km and up to 175km from contractor's office	sum	**4,800.00**
	e. Over 175km and up to 225km from contractor's office	sum	**5,500.00**
	f. Over 225km and up to 275km from contractor's office	sum	**6,000.00**
	g. Over 275km and up to 325km from contractor's office	sum	**6,700.00**
	h. Over 325km and up to 375km from contractor's office	sum	**7,200.00**
	i. Over 375km and up to 425km from contractor's office	sum	**7,900.00**
	j. Over 425km and up to 475km from contractor's office	sum	**8,400.00**
	k. Over 475km and up to 525km from contractor's office	sum	**9,000.00**
	l. Over 525km from contractor's office	sum	**9,600.00**
2.2	**Pontoon**		
2.2.1	Drum Pontoon 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.	sum	**9,200.00**
	Jack-Up Pontoon b. Provide and install a complete set of jack-up pontoon including all necessary works to the suitable depth of water and uninstall upon completion. Rate to include mobilization and demobilization.	sum	**120,000.00**
	c Provision of tug boat and small passenger boat for an access.	day	**1,700.00**

BILL NO. 2 : DEEP BORING

Item	Description	Unit	Rate JKHSI 2018 (RM)
2	**DEEP BORING**		
2.3	**Plant Movement**		
2.3.1	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	**690.00**
	b. Hillslopes	No	**1,370.00**
	c. Floating Platform		
	i. With drum pontoon	No	**2,600.00**
	ii. With jack up pontoon	No	**1,050.00**
	d. Fixed Platform	No	**4,800.00**
	e. Swampy ground		
	i. With staging	No	**3,810.00**
	f. Jungle	No	**5,500.00**
2.4	**Boring In Soil**		
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 10 m.	m	**51.00**
	b. Ditto exceeding 10 m but n.e. 20 m	m	**60.00**
	c. Ditto exceeding 20 m but n.e. 30 m	m	**62.00**
	d. Ditto exceeding 30 m but n.e. 40 m	m	**63.00**
	e. Ditto exceeding 40 m but n.e. 50 m	m	**66.00**
	f. Ditto exceeding 50 m.	m	**113.00**

BILL NO. 2 : DEEP BORING

Item	Description	Unit	Rate JKHSI 2018 (RM)
2	**DEEP BORING**		
2.5	**Drilling In Rock**		
2.5.1	Carry out vertical diamond core drilling of [52 mm] diameter into rock including storing of core samples in standard boxes.		
	a. **Water [as drilling fluid]**		
	i. Not exceeding 10 m.	m	**190.00**
	ii. Ditto exceeding 10 but n.e 20 m.	m	**201.00**
	iii. Ditto exceeding 20 but n.e 30 m.	m	**202.00**
	iv. Ditto exceeding 30 but n.e 40 m.	m	**232.00**
	v. Ditto exceeding 40 but n.e 50 m.	m	**305.00**
	vi. Ditto exceeding 50 m.	m	**325.00**
	b. **Reaming casing**		
	i. Not exceeding 10 m.	m	**91.00**
	ii. Ditto exceeding 10 but n.e 20 m.	m	**109.00**
	iii. Ditto exceeding 20 but n.e 30 m.	m	**133.00**
	iv. Ditto exceeding 30 but n.e 40 m.	m	**147.00**
	v. Ditto exceeding 40 but n.e 50 m.	m	**160.00**
	vi. Ditto exceeding 50 m.	m	**190.00**
2.6	**Test**		
2.6.1	**Standard penetration test**		
	a. Not exceeding 10 m.	no	**30.00**
	b. Ditto exceeding 10 m but n.e. 20 m	no	**34.00**
	c. Ditto exceeding 20 m but n.e. 30 m	no	**36.00**
	d. Ditto exceeding 30 m but n.e. 40 m	no	**40.00**
	e. Ditto exceeding 40 m but n.e. 50 m	no	**47.00**
	f. Ditto exceeding 50 m.	no	**48.00**

BILL NO. 2 : DEEP BORING

Item	Description	Unit	Rate JKHSI 2018 (RM)
2	**DEEP BORING**		
2.6	**Test (Cont'd)**		
2.6.2	**Vane shear test**		
	a. Not exceeding 10 m.	no	**63.00**
	b. Ditto exceeding 10 m but n.e. 20 m	no	**69.00**
	c. Ditto exceeding 20 m but n.e. 30 m	no	**79.00**
	d. Ditto exceeding 30 m but n.e. 40 m	no	**80.00**
	e. Ditto exceeding 40 m but n.e. 50 m	no	**89.00**
	f. Ditto exceeding 50 m.	no	**112.00**
2.6.3	**Pressure meter test**		
	a. Not exceeding 10 m.	no	**690.00**
	b. Ditto exceeding 10 m but n.e. 20 m	no	**700.00**
	c. Ditto exceeding 20 m but n.e. 30 m	no	**720.00**
	d. Ditto exceeding 30 m but n.e. 40 m	no	**730.00**
	e. Ditto exceeding 40 m but n.e. 50 m	no	**750.00**
	f. Ditto exceeding 50 m.	no	**800.00**
2.6.4	**Field permeability test**		
	a. Not exceeding 10 m.	no	**640.00**
	b. Ditto exceeding 10 m but n.e. 20 m	no	**680.00**
	c. Ditto exceeding 20 m but n.e. 30 m	no	**690.00**
	d. Ditto exceeding 30 m but n.e. 40 m	no	**690.00**
	e. Ditto exceeding 40 m but n.e. 50 m	no	**700.00**
	f. Ditto exceeding 50 m.	no	**710.00**
2.6.5	**Dynamic cone test**		
	a. Not exceeding 10 m.	no	**214.00**

BILL NO. 2 : DEEP BORING

Item	Description	Unit	Rate JKHSI 2018 (RM)
2	**DEEP BORING**		
	b. Ditto exceeding 10 m but n.e. 20 m	no	**267.00**
	c. Ditto exceeding 20 m but n.e. 30 m	no	**320.00**
	d. Ditto exceeding 30 m but n.e. 40 m	no	**374.00**
	e. Ditto exceeding 40 m but n.e. 50 m	no	**427.00**
	f. Ditto exceeding 50 m.	no	**530.00**
2.7	**Sampling**		
2.7.1	Carry out the following sampling in borehole including transportation and protection as per Specification.		
	a. Disturbed samples		
	i. Not exceeding 10 m.	no	**22.00**
2.7	**Sampling (Cont'd)**		
2.7.1	Carry out the following sampling in borehole including transportation and protection as per Specification. (cont'd)		
	a. Disturbed samples (Cont'd)		
	ii. Ditto exceeding 10 but n.e 20 m.	no	**24.00**
	iii. Ditto exceeding 20 but n.e 30 m.	no	**26.00**
	iv. Ditto exceeding 30 but n.e 40 m.	no	**28.00**
	v. Ditto exceeding 40 but n.e 50 m.	no	**30.00**
	vi. Ditto exceeding 50 m.	no	**32.00**
	b. Undisturbed sample using thin wall tube sampler		
	i. Not exceeding 10 m.	no	**45.00**
	ii. Ditto exceeding 10 but n.e 20 m.	no	**51.00**
	iii. Ditto exceeding 20 but n.e 30 m.	no	**57.00**
	iv. Ditto exceeding 30 but n.e 40 m.	no	**65.00**

BILL NO. 2 : DEEP BORING

Item	Description	Unit	Rate JKHSI 2018 (RM)
2	**DEEP BORING**		
	v. Ditto exceeding 40 but n.e 50 m.	no	**67.00**
	vi. Ditto exceeding 50 m.	no	**70.00**
	c. Undisturbed sample using Mazier sampler		
	i. Not exceeding 10 m.	no	**124.00**
	ii. Ditto exceeding 10 but n.e 20 m.	no	**191.00**
	iii. Ditto exceeding 20 but n.e 30 m.	no	**210.00**
	iv. Ditto exceeding 30 but n.e 40 m.	no	**215.00**
	v. Ditto exceeding 40 but n.e 50 m.	no	**267.00**
	vi. Ditto exceeding 50 m.	no	**288.00**
	d. Undisturbed sample using piston sampler		
	i. Not exceeding 10 m.	no	**116.00**
	ii. Ditto exceeding 10 but n.e 20 m.	no	**125.00**
	iii. Ditto exceeding 20 but n.e 30 m.	no	**151.00**
	iv. Ditto exceeding 30 but n.e 40 m.	no	**182.00**
	v. Ditto exceeding 40 but n.e 50 m.	no	**203.00**
	vi. Ditto exceeding 50 m.	no	**224.00**
	e. Undisturbed sample using Denison sampler		
	i. Not exceeding 10 m.	no	**160.00**
	iii. Ditto exceeding 20 but n.e 30 m.	no	**171.00**
	iv. Ditto exceeding 30 but n.e 40 m.	no	**182.00**
2.7	**Sampling (Cont'd)**		
2.7.1	Carry out the following sampling in borehole including transportation and protection as per Specification. (cont'd)		
	e. Undisturbed sample using Denison sampler (Cont'd)		
	v. Ditto exceeding 40 but n.e 50 m.	no	**192.00**

BILL NO. 2 : DEEP BORING

Item	Description	Unit	Rate JKHSI 2018 (RM)
2	**DEEP BORING**		
	vi. Ditto exceeding 50 m.	no	**203.00**
	vi. Exceeding 50 m.	no	**214.00**
	f. Water sample [minimum 1 litre]		
	i. Not exceeding 10 m.	no	**15.00**
	ii. Ditto exceeding 10 but n.e 20 m.	no	**17.00**
	iii. Ditto exceeding 20 but n.e 30 m.	no	**17.00**
	iv. Ditto exceeding 30 but n.e 40 m.	no	**18.00**
	v. Ditto exceeding 40 but n.e 50 m.	no	**18.00**
	vi. Ditto exceeding 50 m.	no	**19.00**
2.8	**Miscellaneous**		
2.8.1	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 borehole must be clear labelled, coloured and permanent (at PVC pipe and/or concrete base)	no	**86.00**

BILL NO. 3 : CONE PENETRATION TEST

Item	Description	Unit	Rate JKHSI 2018 (RM)
3	**CONE PENETRATION TEST**		
3.1	**Mobilisation and Demobilisation**		
	Mobilisation of plants and other equipments to the site and demobilisation upon completion (20 tonnes)		
	a. Up to 25km from contractor's office	sum	11,000.00
	b. Over 25km and up to 125km from contractor's office	sum	12,000.00
	c. Over 125km and up to 225km from contractor's office	sum	13,000.00
	d. Over 225km and up to 325km from contractor's office	sum	14,000.00
	e. Over 325km and up to 425km from contractor's office	sum	15,000.00
	f. Over 425km and up to 525km from contractor's office	sum	16,000.00
	g. Over 525km from contractor's office	sum	19,000.00
3.2	**Plant Movement**		
3.2.1	Shifting of plant and equipment from one borehole position to the next borehole		
	a. Flat Land	No	620.00
	b. Hillslopes	No	2,140.00
	c. Floating Platform		
	i With drum pontoon	No	**5,300.00**
	d. Fixed Platform	No	4,270.00
	e. Swampy ground		
	i With staging	No	4,270.00
	f. Jungle	No	2,670.00
3.3	**Test**		
3.3.1	**Deep sound test**		
	a. Not exceeding 10 m.	m	32.00
	b. Ditto exceeding 10 m but n.e. 20 m	m	35.00
	c. Ditto exceeding 20 m but n.e. 30 m	m	37.00
	d. Ditto exceeding 30 m but n.e. 40 m	m	41.00

BILL NO. 3 : CONE PENETRATION TEST

Item	Description	Unit	Rate JKHSI 2018 (RM)
3	**CONE PENETRATION TEST**		
	e. Ditto exceeding 40 m but n.e. 50 m	m	45.00
	f. Ditto exceeding 50 m.	m	51.00
3.3.2	Friction reducer to deep sounding test	No	65.00
3.3	**Test (Cont'd)**		
3.3.3	**Piezocone**		
	a. Not exceeding 10 m.	m	35.00
	b. Ditto exceeding 10 m but n.e. 20 m	m	42.00
	c. Ditto exceeding 20 m but n.e. 30 m	m	49.00
	d. Ditto exceeding 30 m but n.e. 40 m	m	56.00
	e. Ditto exceeding 40 m but n.e. 50 m	m	63.00
	f. Ditto exceeding 50 m.	m	64.00
3.3.4	**Dissipation Test (maximum of 2 hours)**		
	a. Not exceeding 10 m.	m	240.00
	b. Ditto exceeding 10 m but n.e. 20 m	m	240.00
	c. Ditto exceeding 20 m but n.e. 30 m	m	240.00
	d. Ditto exceeding 30 m but n.e. 40 m	m	240.00
	e. Ditto exceeding 40 m but n.e. 50 m	m	240.00
	f. Ditto exceeding 50 m.	m	240.00
3.4	**Miscellaneous**		
3.4.1	Test 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 borehole must be clear labelled, coloured and permanent (at PVC pipe and/or concrete base)	No	123.00

BILL NO. 4 : FIELD TESTS

Item	Description	Unit	Rate JKHSI 2018 (RM)
4	**FIELD TEST**		
4.1	**Mobilisation and Demobilisation**		
	Mobilisation of personnel and equipment to site and demobilisation upon completion.		
	a. Up to 25km from contractor's office	sum	1,530.00
	b. Over 25km and up to 225km from contractor's office	sum	1,960.00
	c. Over 225km and up to 425km from contractor's office	sum	2,400.00
	d. Over 425km from contractor's office	sum	2,730.00
4.2	**Hand Auger**		
	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	33.00
	b. Exceeding 2.5-5m	m	39.00
	c. exceeding 5m - 7.5m	m	50.00
4.2.2	Disturbed sample	no	19.00
4.2.3	Undisturbed samples using thin wall tube sampler	no	27.00
4.2.4	Water sample [min. 1 litres].	no	19.00
4.3	**Trial Pit**		
	Rate for sampling shall be deemed to include transportation and protection as per specification		
4.3.1	Pit size (2m x 2m x2m) including excavation, lateral support, barricade, temporarily covered, logging and mapping of side wall and backfilling, and ground water observation as per specification.	no	550.00
4.3.2	Small disturbed sample.	no	19.00
4.3.3	Bulk sample	no	69.00
4.3.4	Block sample [300 mm x 300 mm x 300 mm)	no	464.00
4.3.5	Water sample [min. 1 litres].	no	19.00

BILL NO. 4 : FIELD TESTS

Item	Description	Unit	Rate JKHSI 2018 (RM)
4	**FIELD TEST**		
4.4	**Testing**		
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	157.00
4.4	**Testing (Cont'd)**		
4.4.2	Penetration Vane shear test.		
	a. Not exceeding 10 m.	m	85.00
	b. Ditto exceeding 10 m but n.e. 20 m	m	101.00
	c. Ditto exceeding 20 m but n.e. 30 m	m	112.00
	d. Ditto exceeding 30 m but n.e. 40 m	m	124.00
	e. Ditto exceeding 40 m but n.e. 50 m	m	135.00
	f. Ditto exceeding 50 m.	m	157.00
4.4.3	Plate bearing test.	no	5,100.00
4.4.4	*In situ* California Bearing Ratio (CBR) at locations as shown in drawings	no	239.00
4.4.5	Dynamic Cone Penetration Test (DCP)		
	a. Carry out 150mm diameter pavement coring	no	160.00
	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	176.00
	c. Re-instate cored hole with bituminous premix or approved material	no	67.00

BILL NO. 5 : LABORATORY TEST

Item	Description	Unit	Rate JKHSI 2018 (RM)
5	**LABORATORY TEST**		
	All laboratory test shall consists of rock/soil/water samples as directed by		
5.1	**Classification Test**		
	a. Moisture content.	No	**5.10**
	b. Atterberg limits.	set	**35.00**
	c. Bulk Density Test	No	**15.00**
	d. Brightness Test	No	**83.00**
	e. Dry Density Test	No	**15.00**
	f. Specific gravity. (pyknometer)	No	**21.00**
	g. Particle size distribution for fine-grained soils. (hydrometer)	No	**43.00**
	h. Particle size distribution for coarse-grained soils.	No	**21.00**
5.2	**Soil Strength Tests (Each set shall consist of 3 nos. of undisturbed specimen)**		
	a. Unconfined compressive strength.	No	**39.00**
	b. Unconsolidated undrained triaxial (U.U) compression without pore water pressure	set	**122.00**
	c. Unconsolidated undrained triaxial (U.U) compression with pore water pressure measurement.	set	**262.00**
	d. Consolidated undrained triaxial (C.I.U) compression test with pore water pressure measurement.	set	**640.00**
	e. Consolidated drained triaxial (C.D) compression test with pore water pressure measurement.	set	**1,550.00**
	f. [60 mm square] direct shear box test.	set	**402.00**
	g. [100 mm square] direct shear box test.	set	**500.00**
	h. [300 mm square] direct shear box test.	set	**740.00**
	j. [60 mm square] multi-reversal shear box test.	set	**371.00**
	k. [100 mm square] multi-reversal shear box test.	set	**510.00**
	l. Pilcon Hand Vane Tests	No	**101.00**

BILL NO. 5 : LABORATORY TEST

Item	Description	Unit	Rate JKHSI 2018 (RM)
5	**LABORATORY TEST**		
	All laboratory test shall consists of rock/soil/water samples as directed by		
5.3	**Soil Compaction Related Tests (Each set shall consist of 5 nos. of specimen)**		
	a. Standard compaction (2.5 kg hammer).	set	**427.00**
	b. Heavy compaction (4.5 kg hammer).	set	**510.00**
	c. Vibrating hammer.	set	**620.00**
	d. Unsoaked California Bearing Ratio (CBR) [on both ends].	No	**550.00**
	e. Soaked California Bearing Ratio (CBR) [on both ends].	No	**570.00**
5	**LABORATORY TEST (Cont'd)**		
5.4	**Chemical and Electro-chemical Tests**		
	a. Organic matter content.	No	**54.00**
	b. Loss on ignition.	No	**85.00**
	c. Total sulphate content.	No	**54.00**
	d. Sulphate content.	No	**59.00**
	e. Chloride content.	No	**52.00**
	f. pH value.	No	**22.00**
	h. Contaminants.	No	**53.00**
	j. Carbonate Content i. Water/Soil Sample	No.	**99.00**
	ii. Rock Sample	No.	**99.00**
	k. Acid Test for Rock	No	**99.00**
5.5	**Rock -Tests**		
	a. Unconfined compressive strength. (UCS)	No	**172.00**
	b. Unconfined compressive strength (UCS) with Young's modulus and Poisson's ratio measurement.	No	**473.00**
	c. Point load test.	No	**141.00**
	d. Petrographic analysis	No	**160.00**

BILL NO. 5 : LABORATORY TEST

Item	Description	Unit	Rate JKHSI 2018 (RM)
5	**LABORATORY TEST**		
	All laboratory test shall consists of rock/soil/water samples as directed by		
	e. Splitting Tensile Strength	No	**176.00**
	f. Direct Tensile Stength	No	**160.00**
	g. Brazilian Tensile Strength	No	**203.00**
5.6	**Compressibility Test (SOIL)**		
	a. One-dimensional consolidation.(1-D)	No	**250.00**
5.7	**Permeability Tests**		
	a. Falling head	No	**530.00**
	b. Constant head	No	**480.00**

BILL NO. 6 : GEOPHYSICAL SURVEY AND MAPPING

Item	Description	Unit	Rate JKHSI 2018 (RM)
6	**GEOPHYSICAL SURVEY AND MAPPING**		
	Notes: All rates shall include provision of all equipment, transportation to the site, including transfer between location within the site, handling, assembling and removal of the site after completion of operation.		
6.1	**Seismic Refraction Survey**		
	a. Setting out sets of seismic lines, rentising and produce geophone, reduce levels, and topographical profile of each seismic line.	line	**2,310.00**
	b. Carry out seismic refraction survey with a 24-channel seismograph with geophones at specific intervals and 7 shots per set, using sledge hammer as the seismic energy source. Rate to include data analysis to produce geological profile incorporating borehole data where available.	line	**4,010.00**
6.2	**Multi Channel Analysis of Surface Wave (MASW)**		
	a. Setting out sets of seismic lines, rentising and produce geophone, reduce levels and topographical profile of each seismic line.	line	**2,310.00**
	b. Carry out multi channel analysis of surface wave investigation with 24-channel seismograph with geophones at specific intervals for investigation depth up to to 20m depth, using sledge hammer as seismic source to obtain the S-Wave tomogram.	line	**4,060.00**
6.3	**Parallel Seismic Logging**		
	a. Setting out sets of seismic logging in pre-drilled bore holes, produce geophone and reduce levels of each point.	no	**1,170.00**
	b Carry out parallel seismic logging for pile length detection in pre-drilled bore holes with geophones at specific intervals using sledge hammer as the seismic energy source.	no	**2,600.00**
6.4	**Electrical Resistivity Profiling**		
	a. Setting out sets of resistivity profiling, rentising and produce electrodes reduce levels and topographical profile of each resistivity profile line including topographical coordinates of each electrode.	line	**2,310.00**
	b. Carry out electrical resistivity investigation using suitable configuration with electrodes at specific intervals as per Designer's requirements.	m	**46.00**

BILL NO. 6 : GEOPHYSICAL SURVEY AND MAPPING

Item	Description	Unit	Rate JKHSI 2018 (RM)
6	**GEOPHYSICAL SURVEY AND MAPPING**		
6.5	**Gravity Imaging**		
	a Setting out of gravity stations, rentising, reduce levels and topographical profile of each gravity stations.	no	**1,830.00**
	b Carry out gravity data acquisition using gravity meter at a specific distance of every grid system.	no	**338.00**
6	**GEOPHYSICAL SURVEY AND MAPPING (Cont'd)**		
6.6	**Geological Terrain Mapping**		
	a. Setting out sets of Geological terrain mapping all in accordance to guidelines by the Minerals and Geoscience Department, Malaysia, covering area as shown in the drawings.	hectare	**11,000.00**
6.7	**Engineering Geological mapping**		
	a. Setting out sets of Engineering Geological Mapping all in accordance to guidelines by the Minerals and Geoscience Department, Malaysia, covering area as shown in the drawings.	m2	**187.00**

BILL NO. 7 : INSTRUMENTATION

Item	Description	Unit	Rate JKHSI 2018 (RM)
7	**INSTRUMENTATION**		
	Geotechnical instrumentation shall be deemed to include transportation,		
7.1	Pneumatic Piezometer as approved by S.O.		
	a. Not exceeding 10 m.	No	**2,000.00**
	b. Ditto exceeding 10 m but n.e. 20 m	No	**2,200.00**
	c. Ditto exceeding 20 m but n.e. 30 m	No	**2,400.00**
	d. Ditto exceeding 30 m but n.e. 40 m	No	**2,600.00**
	e. Ditto exceeding 40 m but n.e. 50 m	No	**2,800.00**
	f. Ditto exceeding 50 m.	No	**3,000.00**
7.2	Standpipe Piezometer as approved by S.O.		
	a. Not exceeding 10 m.	No	**530.00**
	b. Ditto exceeding 10 m but n.e. 20 m	No	**560.00**
	c. Ditto exceeding 20 m but n.e. 30 m	No	**590.00**
	d. Ditto exceeding 30 m but n.e. 40 m	No	**620.00**
	e. Ditto exceeding 40 m but n.e. 50 m	No	**650.00**
	f. Ditto exceeding 50 m.	No	**680.00**
7.3	Inclinometer as approved by S.O.		
	a. Not exceeding 10 m.	No	**2,290.00**
	b. Ditto exceeding 10 m but n.e. 20 m	No	**2,390.00**
	c. Ditto exceeding 20 m but n.e. 30 m	No	**2,490.00**
	d. Ditto exceeding 30 m but n.e. 40 m	No	**2,590.00**
	e. Ditto exceeding 40 m but n.e. 50 m	No	**2,690.00**

BILL NO. 7 : INSTRUMENTATION

Item	Description	Unit	Rate JKHSI 2018 (RM)
	f. Ditto exceeding 50 m.	No	**2,790.00**
7.5	Ground settlement marker (GSM) as approved by S.O.	No	**276.00**
7.6	Building settlement marker (BSM) as approved by S.O.	No	**424.00**
7.7	Settlement plate as approved by S.O.	No	**590.00**
7	**INSTRUMENTATION (Cont'd)**		
7.8	Settlement displacement marker as approved by S.O.	No	**320.00**
7.9	Tiltmeter on structures including references plate securely bonded or bolted as per Specification	No	**750.00**
7.10	Monitoring and reading related instrumentation (collection of data, analysis and verification)		
	a. every week	trip	**530.00**
	b. twice a month	trip	**960.00**
	c. once a month	trip	**1,600.00**

BILL NO. 8 : REPORT

Item	Description	Unit	Rate JKHSI 2018 (RM)
8	**REPORT**		
8.1	**Final Report**		
8.1.1	To submit six (6) sets of soil investigation report which include laboratory test results in hardcopy with comb binding. The report shall be endorsed by PEPC/P.Geol	sum	**1,600.00**
8.1.2	To submit six (6) copies of CD for the following item below : a. Full report in PDF Format b. Field work summary template including coordinates in MS Excel Format c. Photos for all field tests complete with coordinates and dates (JPEG Format) d. As built Drawing in Autocad Format e. Others information as stated in Terms Of Reference (TOR) SI as directed by S.O (if any)	sum	**320.00**
8.1.3	**Seismic Refraction Survey Report**		
	a Seismic refraction survey report as per Designer's requirement to be submitted in 6 (six) sets with comb binding and six (6) CDs. Rate to include geological sections and interpretation of data by PEPC/P. Geol.	sum	**5,200.00**
8.1.4	**Multi Chanel Analysis of Surface Wave (MASW) Survey Report**		
	a. Multi Chanel Analysis of Surface Wave (MASW) Survey Report as per Designer's requirement to be submitted in 6 (six) sets with comb binding and six (6) CDs. Rate to include geological sections and interpretation of data by PEPC/P. Geol	sum	**5,500.00**
8.1.5	**Parallel Seismic Logging Report**		
	a. Parallel Seismic Logging Survey Report as per Designer's requirement to be submitted in 6 (six) sets and six (6) CDs. set with comb binding. Rate to include subsurface profile of logging image endorsed by PEPC/P. Geol.	sum	**5,500.00**
8.16	**Electrical Resistivity Profiling Report**		
	a. Resistivity profiling report as per Designer's requirement to be submitted in 6 (six) sets with comb binding and six (6) CDs. Rate to include 2D & 3D subsurface profile based on data obtained from electrical resistivity survey and incorporating borehole data where available endorsed by PEPC/P. Geol	sum	**5,400.00**
8.1.7	**Gravity Imaging Report**		
	a. Gravity Imaging Report as per Designer's requirement to be submitted in 6 (six) sets with comb binding and six (6) CDs. Rate to include subsurface profile based on data obtained from gravity data acquisation incorporating borehole data where available endorsed by PEPC/P. Geol.	sum	**5,800.00**
8.1.8	**Geological Terrain Mapping**		
	a. Geological terrain mapping report as per Designer's requirement to be submitted in 6 (six) set with comb binding and six (6) CD. Report shall endorsed by P. Geol	sum	**5,600.00**

BILL NO. 8 : REPORT

Item	Description	Unit	Rate JKHSI 2018 (RM)
8	**REPORT**		
8	**REPORT (Cont'd)**		
8.1.9	**Engineering Geological Mapping Report**		
	a. Engineering Geological mapping report as per Designer's requirement to be submitted in 1 (one) set with comb binding. Rate to include geological sections and interpretation of data by P. Geol.	sum	**4,940.00**
8.1.11	**Instrumentations Report**		
	a. To provide interim monitoring report as requested by S.O	sum	**2,670.00**
	b. To submit of 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.	sum	**2,400.00**