

BAHAGIAN 3.6 : PILING WORK (CLASS H)

Kawasan Utara - Perlis, Kedah, Pulau Pinang dan Perak
 Kawasan Tengah - Wilayah Persekutuan Kuala Lumpur, Melaka, Negeri Sembilan,
 Selangor dan Johor
 Kawasan Timur - Pahang, Terengganu dan Kelantan

BIL	KETERANGAN KERJA	UNIT	KAWASAN UTARA		KAWASAN TENGAH		KAWASAN TIMUR		KESELURUHAN	
			PURATA (RM)	JULAT (RM)	PURATA (RM)	JULAT (RM)	PURATA (RM)	JULAT (RM)	PURATA (RM)	JULAT (RM)
	<u>PLANT AND EQUIPMENT</u>									
	Bored Pile									
1	Allow for mobilization and demobilization of all labour, plants, piling and drilling equipments, etc. on site, for the proposed piling works.	Sum			140,366.67	20,000.00 - 185,000.00			140,366.67	20,000.00 - 185,000.00
	Micro Pile									
2	Allow for provision of plant and transporting to and off the site (upon completion), handling, assembling, erecting, dismantling and removal of site on completion of the works all necessary piling equipment, plant, tools and ancillary equipment and for the proper execution of piling works.	Sum			24,483.61	3,000.00 - 60,000.00			24,483.61	3,000.00 - 60,000.00
3	Move and handling including moving and handling all piling plant and equipment about the site as often and whenever necessary for the execution of the whole piling operation.	Sum			12,918.22	1,500.00 - 30,000.00			12,918.22	1,500.00 - 30,000.00
	R.C Piles									
4	Mobilisation & demobilisation inclusive of all temporary staging.	Sum			11,559.38	7,000.00 - 18,000.00			11,559.38	7,000.00 - 18,000.00

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5	BORED PILES Drill 1000mm nominal diameter vertical holes through whatever soil strata other than rock with provision of temporary casing.	m			292.19	109.00 - 450.00			292.19	109.00 - 450.00
6	Drilled 1000mm nominal diameter vertical holes in rock.	m			1,751.62	900.00 - 2,200.00			1,751.62	900.00 - 2,200.00
7	1000mm Nominal diameter x 12mm thick permanent casing.	m			2,223.92	2,000.00 - 3,300.00			2,223.92	2,000.00 - 3,300.00
8	High yield reinforcement as specified: a) Up to 12mm diameter.	tonne			3,436.27	3,000.00 - 3,636.00			3,436.27	3,000.00 - 3,636.00
9	b) 16mm diameter and above.	tonne			3,436.27	3,000.00 - 3,636.00			3,436.27	3,000.00 - 3,636.00
10	4 nos x 50mm Nominal diameter x 4mm thick wall mild steel pipe in accordance with the Specification and as shown in Drawing.	m			79.51	35.00 - 150.00			79.51	35.00 - 150.00
11	Concreted length with Grade 40/20 as specified.	m3			361.48	253.60 - 497.40			361.48	253.60 - 497.40
12	Non-shrink grout Grade 40 to be fill in sonic logging tubes as specified.	m3			1,050.88	400.00 - 1,370.30			1,050.88	400.00 - 1,370.30
13	Cutting off piles head to required length including preparing pile head as shown in Drawing.	no.			293.63	249.00 - 335.00			293.63	249.00 - 335.00

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	<u>MICRO PILE</u> 200 mm Diameter Micropiles as working piles. <u>Boring in any soil conditions other than rock for micropile including bringing excavated material to the surface, carting away surplus from site and cleaning pile base</u>									
14	200mm diameter pile not exceeding 13.5m deep.	m			81.13	50.00 - 115.00			81.13	50.00 - 115.00
15	Ditto over 13.5m but not exceeding 17.5m deep.	m			90.05	40.00 - 115.00			90.05	40.00 - 115.00
16	Ditto over 17.5m but not exceeding 21.5m deep .	m			97.04	40.00 - 125.00			97.04	40.00 - 125.00
17	Ditto over 21.5m but not exceeding 25.5m deep.	m			106.72	40.00 - 150.00			106.72	40.00 - 150.00
18	Ditto over 25.5m.	m			116.79	40.00 - 170.00			116.79	40.00 - 170.00
19	Supply and install 139mm dia. X 7.72mm thick API pipes N-80 (yield strength 550N/mm2) in 2 m lengths.	m			144.51	50.00 - 225.00			144.51	50.00 - 225.00
20	Joint threading of 139mm dia. API pipes .	no.			41.75	24.00 - 60.00			41.75	24.00 - 60.00
	<u>Tremie non-shrink cement grout ; 'Portland' cement or approved equivalent, grade C30</u>									
21	200mm dia. Cast in-situ micropile (measured from toe to cut off level) - assume 1.2 bag cement per meter.	m			48.79	35.00 - 68.50			48.79	35.00 - 68.50

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22	MICRO PILE (cont'd) Cutting off excess cement grout to required cut-off level.	no.			82.81	50.00 - 120.00			82.81	50.00 - 120.00
23	Fabricate and install pile head inclusive of 20mm thick steel plate and stiffeners.	no.			134.89	60.00 - 184.00			134.89	60.00 - 184.00
24	300 mm Diameter Micropiles as working piles. Boring in earth using odex drilling system or equivalent.	m	112.09	63.00-120.00					112.09	63.00-120.00
25	Boring through rock. Rate to include natural and	m	204.77	150.00-220.00					204.77	150.00-220.00
26	Supply and install 267 mm OD x 257 mm diameter I.D permanent casing.	m	133.26	108.00-230.00					133.26	108.00-230.00
27	High tensile reinforcement straight bars, nominal diameter not exceeding 40 mm. Rate to include supporting reinforcement.	tonne	3,384.09	3,300.00-3,800.00					3,384.09	3,300.00-3,800.00
28	Mild steel R6 spiral link at 150mm pitch.	tonne	3,384.09	3,300.00 - 3,800.00					3,384.09	3,300.00 - 3,800.00
29	Grouting with non-shrink cement grout Grade [C30] as specified into drilled hole. Rate shall include excess cement required when the grout volume exceeded shall include excess cement required when the grout volume exceeded the theoretical the theoretical	m3	668.01	250.00 - 950.00					668.01	250.00 - 950.00
30	Cut-off piles. Rate to include preparing heads.	no.	104.20	30.00 - 150.00					104.20	30.00 - 150.00

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			PURATA (RM)	JULAT (RM)	PURATA (RM)	JULAT (RM)	PURATA (RM)	JULAT (RM)	PURATA (RM)	JULAT (RM)
	<u>PRECAST REINFORCED CONCRETE PILES</u>									
	Supply									
31	Supply 200mm x 200mm Precast R.C. Pile initial piles, 12.0m length.	no.			486.00	432.00 - 672.00			486.00	432.00 - 672.00
32	Supply and deliver to site 300mm x 300mm precast R.C. pile 12m initial pile	no.			833.78	730.00 - 1,100.00			833.78	730.00 - 1,100.00
33	Supply 200mm x 200mm Precast R.C. Pile extension piles, 6.0m length	no.			252.00	158.40 - 408.00			252.00	158.40 - 408.00
	Supply, Handle and Pitch									
34	Supply, handle and pitch of 200mm x 200mm Precast R.C. Pile initial piles, 6.0m length.	no.			272.86	198.00 - 420.00			272.86	198.00 - 420.00
35	Supply, handle and pitch of 200mm x 200mm Precast R.C. Pile extension piles, 6.0m length.	no.			285.99	198.00 - 390.00			285.99	198.00 - 390.00
36	Supply, handle and pitch of 200mm x 200mm Precast R.C. Pile extension piles, 12.0m length	no.			287.00	316.80 - 690.00			287.00	316.80 - 690.00
37	Supply, handle and pitch of 250mm x 250mm Precast R.C. Pile initial piles, 12.0m length.	no.			560.00	320.00 - 712.50			560.00	320.00 - 712.50
38	Supply, handle and pitch of 250mm x 250mm Precast R.C. Pile extension piles, 12.0m length.	no.			487.00	315.00 - 712.50			487.00	315.00 - 712.50

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			PURATA (RM)	JULAT (RM)	PURATA (RM)	JULAT (RM)	PURATA (RM)	JULAT (RM)	PURATA (RM)	JULAT (RM)
	<u>PRECAST REINFORCED CONCRETE PILES (cont'd)</u>									
	Handle, Transport and Pitch									
39	Handle, transport and pitch of 200mm x 200mm Precast R.C. Pile initial piles, 12.0m length	no.			15.60	9.00 - 50.00			15.60	9.00 - 50.00
40	Handle, transport and pitch of 200mm x 200mm Precast R.C. Pile extension piles, 6.0m length	no.			14.90	9.00 - 50.00			14.90	9.00 - 50.00
	Handle, Pitch and Drive									
41	Handle, pitch and drive vertical 300mm x 300mm precast RC pile	m			21.11	12.00 - 30.00			21.11	12.00 - 30.00
	Drive									
42	Drive 200mm x 200mm piles	m			14.08	5.00 - 25.00			14.08	5.00 - 25.00
43	Drive 250mm x 250mm piles	m			18.00	6.80 - 27.50			18.00	6.80 - 27.50
	Pile Shoe									
44	Allow for the supply, deliver and fix an approved mild steel pile shoe to toe of initial 200mm x 200mm Precast concrete pile as described.	no.			21.90	10.00 - 50.00			21.90	10.00 - 50.00
	Jointing									
45	Butt weld connection 0.60m girth between edges of and including mild steel extension head, base cap plates, bars etc and including coated heavily with bituminous compound for jointing 200mm x 200mm R.C. piles.	no.			24.85	9.00 - 50.00			24.85	9.00 - 50.00

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			PURATA (RM)	JULAT (RM)	PURATA (RM)	JULAT (RM)	PURATA (RM)	JULAT (RM)	PURATA (RM)	JULAT (RM)
46	<u>PRECAST REINFORCED CONCRETE PILES (cont'd)</u> Butt weld connection 0.60m girth between edges of and including mild steel extension head, base cap plates, bars etc and including coated heavily with bituminous compound for jointing 250mm x 250mm R.C. piles.	no.			30.60	20.00 - 50.00			30.60	20.00 - 50.00
47	Allow for jointing 200mm x 200mm Precast concrete pile as per manufacture's detail and specification.	no.			31.30	20.00 - 50.00			31.30	20.00 - 50.00
48	Cut off piles including preparing pile heads Allow for cutting off pile head 200mm x 200mm Precast concrete pile.	no.			38.20	17.60 - 60.00			38.20	17.60 - 60.00
49	Cut off and remove surplus length of 300mm x 300mm RC pile head and bend reinforcement for connection as specified.	no.			41.59	31.00 - 50.80			41.59	31.00 - 50.80

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50	STEEL SHEET PILES Supply and deliver interlocking steel sheet piles 3.0m long.	m2	386.00	320.00 - 470.00					386.00	320.00 - 470.00
51	Supply and drive 12 m long steel sheet pile type OZ 13A or other equal equivalent along the river bank	m2			311.00	180.00 - 460.00			311.00	180.00 - 460.00
52	Handle, pitch and drive steel sheet pile to required set and level.	m2	27.78	20.00 - 50.00					27.78	20.00 - 50.00
53	Apply two layer of anti-rust epoxy pain to the expose steel sheet piles. <u>Interlocking Grade 43A sheet piles at 76.1kg/m, section modulus of 2270 cm3/m.</u> <u>Rates in include 2 layers of paint on both side of the steel sheet piles as per Clause 6.12 in specification.</u>	m2			40.64	25.00-56.00			40.64	25.00-56.00
54	Supply in 6m length.	m2	523.03	300.00 - 620.00					523.03	300.00 - 620.00
55	Supply in 9m length sheet pile.	m2	584.82	300.00 - 800.00					584.82	300.00 - 800.00
56	Supply in 12m length sheet pile.	m2	641.92	500.00 - 960.00					641.92	500.00 - 960.00
57	Depth driven.	m	40.96	18.00 - 52.00					40.96	18.00 - 52.00
58	Cut-off piles. Rate to include preparing heads.	no.	42.35	20.00 - 60.00					42.35	20.00 - 60.00

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	<u>ERP SYSTEM</u> Handle, transport, pitch, drive and install the eco-raft piles foundation system (ERP system) using penetration method or approved equivalent so as to obtain an integral interlocking raft-pile foundation system.									
59	3m pipe (pile elements)	no.	131.18	120.00 - 136.50					131.18	120.00 - 136.50
60	1m pipe (raft elements)	no.	42.98	40.00 - 50.00					42.98	40.00 - 50.00
61	Supply and install ERP plugs for eco-friendly raft piles foundation system (ERP system) as specified in the Drawings or as directed by the S.O.	no.	12.08	11.00 - 13.00					12.08	11.00 - 13.00
62	Supply and install ERP connectors for eco-friendly raft piles foundation system (ERP system) as specified in the Drawings or as directed by the S.O.	no.	100.34	92.00 - 120.00					100.34	92.00 - 120.00
63	Supply and install ERP pile shoes for eco-friendly raft piles foundation system (ERP system) as specified in the Drawings or as directed by the S.O.	no.	45.04	40.00 - 50.00					45.04	40.00 - 50.00
64	Supply and install ERP fasteners (bolts and nuts) for eco-friendly raft piles foundation system (ERP system) as specified in the Drawings or as directed by the S.O.	no.	2.52	2.00 - 4.00					2.52	2.00 - 4.00

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65	<u>BAKAU PILES</u> Supply, handle and pitch bakau pile 100 mm average dia. x 4.8 m long.	no.	17.12	12.50 - 20.00					17.12	12.50 - 20.00
66	Drive only bakau pile 100 mm average diameter	m	1.82	0.65 - 4.00					1.82	0.65 - 4.00
	<u>TESTING</u>									
	Bored Piles									
	<u>Carry out initial maintained load test to 2.0 times of maximum working load in accordance with the Specification.</u>									
67	Pile with working load of 5500kN.	no.			56,141.54	50,000.00 - 60,900.00			56,141.54	50,000.00 - 60,900.00
	<u>Carry out subsequent maintained load test to 2.0 times of maximum working load in accordance with the Specification.</u>									
68	Pile with working load of 5500kN.	no.			35,429.23	19,360.00 - 50,000.00			35,429.23	19,360.00 - 50,000.00
69	Carry out pile integrity test using impulse response method in accordance with the Specification.	no.			532.58	148.00 - 1500.00			532.58	148.00 - 1500.00
70	Carry out integrity test using sonic logging method in accordance with the Specification.	no.			2,868.24	680.00 - 5024.30			2,868.24	680.00 - 5024.30
71	Carry out pile driving analyer (PDA) in accordance with the Specification.	no.			2,332.79	485.00 - 5024.30			2,332.79	485.00 - 5024.30

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72	Micro Pile <u>Ultimate Load Test</u> Working tension load test to two times the working capacity on 200mm diameter micropile (60 tonnes working load)	no.			17,895.38	10,000.00 - 25,000.00			17,895.38	10,000.00 - 25,000.00
73	<u>PDA Test</u> Supply all necessary labour, material and equipment for carrying PDA test with submission of report (3 copies) all as described on 200mm dia. Micropile	no.			2,127.42	500.00 - 3,000.00			2,127.42	500.00 - 3,000.00
74	R.C Piles PDA Load Test of pile including all instrumentation, equipment, labour and everything necessary.	no.			5,187.75	1,000.00- 18,000.00			5,187.75	1,000.00- 18,000.00
75	Allow for Pile Dynamic Analyser (PDA) testing.	no.			2,234.69	500.00 - 7,500.00			2,234.69	500.00 - 7,500.00
76	Provide all equipment, hydraulic jack, deflection gauges, kentledge, temporary staging, etc. and test a test pile of any size to a vertical load test before commencement of the piling works complete with report.	no.			12,380.00	8,000.00 - 18,750.00			12,380.00	8,000.00 - 18,750.00
79	Initial load test (static kentledge) for 200mm x 200mm precast concrete pile to a load of 56 tonnes including providing and removing all kentledge, plant, jack and equipment required, including attendance of supervisory staffs during test period, all in accordance with the specifications	no.			10,700.00	2,800.00 - 18,000.00			10,700.00	2,800.00 - 18,000.00