

APPENDIX

Appendix Table 1 Slope characteristics obtained from field investigation

No.	STATION	N	E	ROCK	DESCRIPTION	SLOPE	SLOPE HEIGHT (m)	SOIL DEPTH (m)	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition
1	PK01	873500	433250	Granite	Natural/Fail	65	30	3.00	000/00	000/00	000/00	single blow	4	MW	Wet
2	PK02	873450	434100	Granite & Mud Stone	Natural/Fail	60	12	0.50	067/55	080/88	000/00	nail	4	HW	Wet
3	PK03	873200	434050	Granite	Cut Slope/Fail	60	20	0.50	000/00	000/00	025/45	nail	4	HW	Damp
4	PK04	873800	434350	Granite	Cut Slope/Non	75	17	0.50	N/A	N/A	N/A	single blow	6	SW	Dry
5	PK05	872042	437044	Mud Stone	Cut Slope/Non	75	25	0.00	000/00	000/00	000/00	many blows	8	Fresh	Dry
6	PK06	872597	437468	Mud Stone	Cut Slope/Fail	65	20	2.00	000/00	324/40	183/88 073/69 026/45 130/64 215/18	pocket knife	6	MW	Wet
7	PK07	874313	437598	Mud Stone	Cut Slope/Non	30	15	0.00	N/A	N/A	N/A	nail	8	MW	Dry
8	PK08	873985	437773	Mud Stone	Cut Slope/Non	5	20	0.00	N/A	N/A	N/A	nail	8	SW	Dry
9	PK09	875000	430200	Granite	Cut Slope/Non	65	18	N/A	N/A	N/A	N/A	many blows	8	SW	Dry
10	PK10	881850	422450	Granite	Cut Slope/Non	60	10	N/A	N/A	N/A	N/A	single blow	6	SW	Dry
11	PK11	881043	421990	Granite	Natural/Fail	30	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A
12	PK12	880650	421400	Granite	Natural/Fail	30	20	1.00	000/00	000/00	135/60 100/45 317/55	pocket knife	4	MW	Damp
13	PK13	880450	422650	Granite	Cut Slope/Fail	50	6	2.00	000/00	000/00	270/35 017/87 256/87	pocket knife	4	MW	Damp
14	PK14	880425	422670	Granite	Cut Slope/Fail	55	10	0.50	000/00	000/00	000/00	pocket knife	4	MW	Wet
15	PK15	880350	422900	Granite	Cut Slope/Fail	60	30	0.00	000/00	000/00	000/00	nail	4	MW	Wet
16	PK16	880075	423125	Granite	Cut Slope/Fail	75	5	0.50	000/00	000/00	000/00	nail	4	MW	Wet
17	PK17	880000	423380	Granite	Natural/Fail	65	20	0.50	000/00	000/00	000/00	nail	6	MW	Damp

Appendix Table 1 Slope characteristics obtained from field investigation (Continued)

No.	STATION	N	E	ROCK	DESCRIPTION	SLOPE	SLOPE HEIGHT (m)	SOIL DEPTH (m)	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition
18	PK18	879450	422400	Granite	Natural/Fail	38	60	0.50	000/00	000/00	248/73 175/35	pocket knife	6	MW	Flowing
19	PK19	879450	422120	Granite	Cut Slope/Fail	45	18	10.00	072/73	000/00	268/38 063/79	single blow	4	MW	Wet
20	PK20	878200	420400	Granite	Cut Slope/Fail	45	30	2.00	000/00	000/00	000/00	pocket knife	8	MW	Damp
21	PK21	878250	420250	Granite	Cut Slope/Non	70	10	1.00	000/00	000/00	225/63 310/87	single blow	8	SW	Dry
22	PK22	878700	420100	Granite	Cut Slope/Non	55	50	1.00	N/A	N/A	N/A	single blow	4	MW	Dry
23	PK23	878223	429523	Mud Stone	Cut Slope/Non	70	20	2.70	000/00	025/20	056/45 106/89 225/46 312/64	single blow	8	Fresh	Dry
24	PK24	875276	422806	Granite	Cut Slope/Non	80	9	1.00	000/00	000/00	289/87 053/25 251/49 176/90	single blow	8	MW	Dry
25	PK25	877230	425520	Granite	Cut Slope/Non	45	8	0.00	000/00	000/00	050/60 065/88 125/75 225/60	many blows	10	Fresh	Flowing
26	PK26	875330	425780	Granite	Cut Slope/Non	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
27	PK27	874750	425050	Granite	Cut Slope/Non	75	70	2.00	225/50	000/00	005/85 025/60 070/85 105/78	many blows	8	SW	Damp
28	PK28	874070	425570	Granite	Cut Slope/Non	70	30	1.00	N/A	N/A	N/A	many blows	8	Fresh	Dry
29	PK29	875320	421300	Granite	Cut Slope/Fail	30	25	1.20	000/00	000/00	213/50 337/70 125/70	many blows	3	MW	Flowing
30	PK30	871970	428200	Granite	Natural/Non	60	20	0.00	N/A	N/A	N/A	many blows	8	SW	Damp
31	PK31	870880	423090	Granite	Cut Slope/Non	85	35	0.00	000/00	000/00	000/00	nail	6	SW	Dry

Appendix Table 1 Slope characteristics obtained from field investigation (Continued)

No.	STATION	N	E	ROCK	DESCRIPTION	SLOPE	SLOPE HEIGHT (m)	SOIL DEPTH (m)	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition
32	PK32	870435	421425	Granite	Cut Slope/Fail	60	45	4.00	000/00	000/00	228/53 145/90 358/58	single blow	5	MW	Damp
33	PK33	870350	421600	Granite	Cut Slope/Non	60	25	0.00	000/00	000/00	270/72	pocket knife	8	MW	Damp
34	PK34	866420	423000	Granite	Cut Slope/Non	70	40	0.00	N/A	N/A	N/A	many blows	8	SW	Damp
35	PK35	863850	423400	Granite	Cut Slope/Fail	65	25	2.00	N/A	N/A	N/A	many blows	8	MW	Wet
36	PK36	878400	419200	Granite	Cut Slope/Fail	70	5	1.00	000/00	000/00	000/00	naill	4	MW	Damp
37	PK37	877210	418860	Granite	Cut Slope/Fail	65	6	1.00	000/00	000/00	000/00	pocket knife	4	CW	Damp
38	PK38	876700	419075	Granite	Cut Slope/Fail	70	12	1.00	000/00	000/00	000/00	many blows	4	MW	Damp
39	PK39	876570	419110	Granite	Cut Slope/Fail	70	10	1.00	000/00	000/00	000/00	many blows	4	MW	Damp
40	PK40	876360	419400	Granite	Cut Slope/Fail	65	9	1.00	000/00	000/00	195/40	single blow	8	MW	Damp
41	PK41	870800	423380	Granite	Cut Slope/Non	65	8	2.00	000/00	000/00	020/68 133/50 035/80 190/90 080/80 135/80	single blow	6	MW	Dripping
42	PK42	872800	424125	Granite	Natural/Fail	55	15	3.00	000/00	000/00	160/45 135/90 190/90 225/70 280/85	single blow	5	MW	Damp
43	PK43	870850	423700	Granite	Cut Slope/Non	65	15	3.00	150/50	000/00	090/90	pocket knife	8	MW	Damp
44	PK44	870650	423400	Granite	Cut Slope/Non	30	15	0.00	000/00	000/00	000/00	pocket knife	6	SW	Damp
45	PK45	894409	424903	Granite	Cut Slope/Non	45	17	2.50	000/00	000/00	088/48	many blows	8	SW	Damp
46	PK46	894618	424687	Granite	Cut Slope/Non	75	30	3.50	000/00	000/00	073/75	single blow	8	SW	Damp

Appendix Table 1 Slope characteristics obtained from field investigation (Continued)

No.	STATION	N	E	ROCK	DESCRIPTION	SLOPE	SLOPE HEIGHT (m)	SOIL DEPTH (m)	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition
47	PK47	871622	421253	Granite	Cut Slope/Fail	50	5	2.00	000/00	000/00	000/00	single blow	8	MW	Damp
48	PK48	871534	421160	Granite	Cut Slope/Non	45	6	2.00	000/00	000/00	000/00	many blows	8	SW	Damp
49	PK49	871500	420900	Granite	Cut Slope/Fail	65	4	2.00	000/00	000/00	000/00	single blow	8	MW	Damp
50	PK50	871459	420533	Granite	Cut Slope/Fail	50	5	1.50	000/00	000/00	000/00	single blow	8	MW	Damp
51	PK51	871650	420500	Granite	Cut Slope/Fail	45	4	2.00	000/00	000/00	000/00	single blow	8	MW	Damp
52	PK52	871552	420650	Granite	Cut Slope/Non	40	6	2.00	000/00	000/00	000/00	single blow	8	MW	Damp
53	PK53	872021	419685	Granite	Cut Slope/Non	50	8	1.50	000/00	000/00	225/50 342/73 088/65	many blows	5	MW	Dry
54	PK54	871959	419670	Granite	Cut Slope/Fail	45	4.5	2.00	000/00	000/00	000/00	many blows	4	MW	Dry
55	PK55	871881	419667	Granite	Cut Slope/Fail	45	6	2.00	000/00	000/00	000/00	nail	4	MW	Damp
56	PK56	876400	423150	Granite	Cut Slope/Fail	45	7	2.50	000/00	000/00	024/71 316/68 285/80 348/65 192/50 232/37	many blows	5	Fresh	Flowing
57	PK57	875681	422660	Granite	Cut Slope/Non	45	15	0.00	000/00	000/00	000/00	many blows	8	Fresh	Damp
58	PK58	869876	421058	Granite	Cut Slope/Fail	35	20	4.00	000/00	000/00	005/35 274/40 135/85 327/89 341/85	single blow	4	MW	Flowing
59	PK59	877455	422171	Granite	Cut Slope/Fail	65	12	2.00	000/00	000/00	227/20 247/20 300/90 005/55	single blow	6	SW	Damp

Appendix Table 1 Slope characteristics obtained from field investigation (Continued)

No.	STATION	N	E	ROCK	DESCRIPTION	SLOPE	SLOPE HEIGHT (m)	SOIL DEPTH (m)	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition
60	PK60	893550	423650	Granite	Cut Slope/Non	70	20	7.00	028/70 135/75 208/87	000/00	037/62 285/80 000/70 247/80 140/70	single blow	8	SW	Damp
61	PK61	892210	421650	Granite	Cut Slope/Non	55	18	2.50	000/00	000/00	000/00	single blow	8	SW	Damp
62	PK62	891193	423100	Granite	Cut Slope/Fail	45	35	N/A	N/A	N/A	N/A	single blow	8	MW	Damp
63	PK63	866700	432300	Mud Stone	Cut Slope/Non	75	25	2.50	xxx/145	108/15	115/90 218/83 255/85	pocket knife	6	Fresh	Dry
64	PK64	864200	433650	Mud Stone	Cut Slope/Non	65	10	N/A	N/A	N/A	N/A	pocket knife	8	SW	Damp
65	PK65	863250	434650	Mud Stone	Cut Slope/Non	60	35	N/A	N/A	N/A	N/A	pocket knife	8	SW	Damp
66	PK66	863900	432500	Mud Stone	Cut Slope/Non	75	23	1.50	000/00	225/35	125/70 183/90 259/42 109/50 043/78	many blows	4	Fresh	Damp
67	PK67	861459	422344	Granite	Cut Slope/Fail	60	15	1.00	000/00	000/00	250/77 193/70 245/60	pocket knife	4	MW	Damp
68	PK68	877600	426640	Granite	Cut Slope/Non	65	30	3.50	000/00	000/00	000/00	single blow	8	MW	Dry
69	PK69	877477	427027	Granite	Cut Slope/Non	65	8	3.00	000/00	000/00	000/00	single blow	8	MW	Damp
70	PK70	877431	427044	Granite	Cut Slope/Non	65	10	3.00	000/00	000/00	000/00	single blow	8	MW	Damp
71	PK71	877018	427424	Mud Stone	Cut Slope/Non	65	20	3.00	258/63 049/90 011/90 084/90	172/50	220/90 180/80	single blow	6	MW	Dry
72	PK72	877208	427584	Mud Stone	Cut Slope/Non	55	10	N/A	N/A	N/A	N/A	single blow	6	SW	Damp
73	PK73	877246	428056	Mud Stone	Cut Slope/Non	70	20	0.00	000/00	000/00	245/63 345/75	single blow	6	SW	Damp

Appendix Table 1 Slope characteristics obtained from field investigation (Continued)

No.	STATION	N	E	ROCK	DESCRIPTION	SLOPE	SLOPE HEIGHT (m)	SOIL DEPTH (m)	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition
74	PK74	874421	422964	Granite	Cut Slope/Fail	65	6	2.50	000/00	000/00	143/60 068/60 225/45 055/45	single blow	4	MW	Damp
75	PK75	872366	423631	Granite	Cut Slope/Fail	55	15	3.00	000/00	000/00	000/00	many blows	4	MW	Flowing
76	PK76	872480	423685	Granite	Cut Slope/Fail	50	20	4.50	010/20 232/75	000/00	285/77 185/50 230/20	many blows	4	SW	Damp
77	PK77	891543	421419	Granite	Cut Slope/Non	75	45	4.00	000/00	000/00	055/70 142/80 080/90 240/70 285/85	single blow	6	SW	Damp
78	PK78	891364	421488	Granite	Cut Slope/Non	75	20	3.00	000/00	000/00	055/70 142/80 080/90 240/70 285/85	single blow	6	SW	Damp
79	PK79	889448	420550	Granite	Cut Slope/Non	75	13	3.00	000/00	000/00	000/00	single blow	8	SW	Damp
80	PK80	889178	420594	Granite	Cut Slope/Non	75	10	2.50	000/00	000/00	000/00	single blow	8	SW	Damp
81	PK81	889746	422597	Granite	Cut Slope/Non	45	38	N/A	N/A	N/A	N/A	single blow	8	SW	Damp
82	PK82	887936	423160	Granite	Cut Slope/Non	45	40	N/A	N/A	N/A	N/A	many blows	8	SW	Damp
83	PK83	878459	432044	Granite	Cut Slope/Non	30	6	2.00	000/00	000/00	063/90 095/88 045/75 035/25 190/50 005/50	many blows	8	SW	Damp
84	PK84	877093	431184	Granite	Cut Slope/Non	75	6	3.50	000/00	000/00	000/00	many blows	8	SW	Dry

Appendix Table 1 Slope characteristics obtained from field investigation (Continued)

No.	STATION	N	E	ROCK	DESCRIPTION	SLOPE	SLOPE HEIGHT (m)	SOIL DEPTH (m)	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition
85	PK85	876928	431043	Granite	Cut Slope/Non	75	15	5.00	000/00	000/00	080/15 000/80 142/80	many blows	8	SW	Damp
86	PK86	876634	430878	Granite	Cut Slope/Non	65	10	3.50	000/00	000/00	080/15 000/80 142/80	many blows	8	SW	Damp
87	PK87	875161	430289	Mud Stone	Cut Slope/Non	85	29	2.00	090/86 165/60	000/00	210/80 266/80 357/75 100/20 170/65 325/50	many blows	6	SW	Damp

Appendix Table 2 Slope characteristics obtained from field investigation for evaluated RMR and SMR

No.	STATION	ROCK	DESCRIPTION	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition	RMR	SMR
1	PK01	Granite	Natural/Fail	000/00	000/00	000/00	single blow	4	MW	Wet	29	29.0
2	PK02	Granite& Mud Stone	Natural/Fail	067/55	080/88	000/00	nail	4	HW	Wet	16	16.0
3	PK03	Granite	Cut Slope/Fail	000/00	000/00	025/45	nail	4	HW	Damp	19	18.1
4	PK04	Granite	Cut Slope/Non	N/A	N/A	N/A	single blow	6	SW	Dry	56	56.0
5	PK05	Mud Stone	Cut Slope/Non	000/00	000/00	000/00	many blows	8	Fresh	Dry	72	72.0
6	PK06	Mud Stone	Cut Slope/Fail	000/00	324/40	183/88 073/69 026/45 130/64 215/18	pocket knife	6	MW	Wet	27	23.8
7	PK07	Mud Stone	Cut Slope/Non	N/A	N/A	N/A	nail	8	MW	Dry	43	43.0
8	PK08	Mud Stone	Cut Slope/Non	N/A	N/A	N/A	nail	8	SW	Dry	48	48.0
9	PK09	Granite	Cut Slope/Non	N/A	N/A	N/A	many blows	8	SW	Dry	77	77.0
10	PK10	Granite	Cut Slope/Non	N/A	N/A	N/A	single blow	6	SW	Dry	53	53.0
11	PK11	Granite	Natural/Fail	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A
12	PK12	Granite	Natural/Fail	000/00	000/00	135/60 100/45 317/55	pocket knife	4	MW	Damp	31	30.1
13	PK13	Granite	Cut Slope/Fail	000/00	000/00	270/35 017/87 256/87	pocket knife	4	MW	Damp	31	24.6
14	PK14	Granite	Cut Slope/Fail	000/00	000/00	000/00	pocket knife	4	MW	Wet	26	26.0
15	PK15	Granite	Cut Slope/Fail	000/00	000/00	000/00	nail	4	MW	Wet	25	25.0

Appendix Table 2 Slope characteristics obtained from field investigation for evaluated RMR and SMR (Continued)

No.	STATION	ROCK	DESCRIPTION	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition	RMR	SMR
16	PK16	Granite	Cut Slope/Fail	000/00	000/00	000/00	nail	4	MW	Wet	25	25.0
17	PK17	Granite	Natural/Fail	000/00	000/00	000/00	nail	6	MW	Damp	31	31.0
18	PK18	Granite	Natural/Fail	000/00	000/00	248/73 175/35	pocket knife	6	MW	Flowing	23	16.6
19	PK19	Granite	Cut Slope/Fail	072/73	000/00	268/38 063/79	single blow	4	MW	Wet	33	26.6
20	PK20	Granite	Cut Slope/Fail	000/00	000/00	000/00	pocket knife	8	MW	Damp	34	34.0
21	PK21	Granite	Cut Slope/Non	000/00	000/00	225/63 310/87	single blow	8	SW	Dry	60	60.0
22	PK22	Granite	Cut Slope/Non	N/A	N/A	N/A	single blow	4	MW	Dry	40	40.0
23	PK23	Mud Stone	Cut Slope/Non	000/00	025/20	056/45 106/89 225/46 312/64	single blow	8	Fresh	Dry	60	56.4
24	PK24	Granite	Cut Slope/Non	000/00	000/00	289/87 053/25 251/49 176/90	single blow	8	MW	Dry	52	47.8
25	PK25	Granite	Cut Slope/Non	000/00	000/00	050/60 065/88 125/75 225/60	many blows	10	Fresh	Flowing	61	61.0
26	PK26	Granite	Cut Slope/Non	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
27	PK27	Granite	Cut Slope/Non	225/50	000/00	005/85 025/60 070/85 105/78	many blows	8	SW	Damp	60	59.1
28	PK28	Granite	Cut Slope/Non	N/A	N/A	N/A	many blows	8	Fresh	Dry	70	70.0

Appendix Table 2 Slope characteristics obtained from field investigation for evaluated RMR and SMR (Continued)

No.	STATION	ROCK	DESCRIPTION	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition	RMR	SMR
29	PK29	Granite	Cut Slope/Fail	000/00	000/00	213/50 337/70 125/70	many blows	3	MW	Flowing	31	30.1
30	PK30	Granite	Natural/Non	N/A	N/A	N/A	many blows	8	SW	Damp	60	60.0
31	PK31	Granite	Cut Slope/Non	000/00	000/00	000/00	nail	6	SW	Dry	46	46.0
32	PK32	Granite	Cut Slope/Fail	000/00	000/00	228/53 145/90 358/58	single blow	5	MW	Damp	37	37.0
33	PK33	Granite	Cut Slope/Non	000/00	000/00	270/72	pocket knife	8	MW	Damp	42	42.0
34	PK34	Granite	Cut Slope/Non	N/A	N/A	N/A	many blows	8	SW	Damp	60	60.0
35	PK35	Granite	Cut Slope/Fail	N/A	N/A	N/A	many blows	8	MW	Wet	47	47.0
36	PK36	Granite	Cut Slope/Fail	000/00	000/00	000/00	nail	4	MW	Damp	28	28.0
37	PK37	Granite	Cut Slope/Fail	000/00	000/00	000/00	pocket knife	4	CW	Damp	22	22.0
38	PK38	Granite	Cut Slope/Fail	000/00	000/00	000/00	many blows	4	MW	Damp	37	37.0
39	PK39	Granite	Cut Slope/Fail	000/00	000/00	000/00	many blows	4	MW	Damp	37	37.0
40	PK40	Granite	Cut Slope/Fail	000/00	000/00	195/40	single blow	8	MW	Damp	45	26.9
41	PK41	Granite	Cut Slope/Non	000/00	000/00	020/68 133/50 035/80 190/90 080/80 135/80	single blow	6	MW	Dripping	32	31.1

Appendix Table 2 Slope characteristics obtained from field investigation for evaluated RMR and SMR (Continued)

No.	STATION	ROCK	DESCRIPTION	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition	RMR	SMR
42	PK42	Granite	Natural/Fail	000/00	000/00	160/45 135/90 190/90 225/70 280/85	single blow	5	MW	Damp	38	37.1
43	PK43	Granite	Cut Slope/Non	150/50	000/00	090/90	pocket knife	8	MW	Damp	42	41.1
44	PK44	Granite	Cut Slope/Non	000/00	000/00	000/00	pocket knife	6	SW	Damp	50	50.0
45	PK45	Granite	Cut Slope/Non	000/00	000/00	088/48	many blows	8	SW	Damp	60	59.1
46	PK46	Granite	Cut Slope/Non	000/00	000/00	073/75	single blow	8	SW	Damp	55	55.0
47	PK47	Granite	Cut Slope/Fail	000/00	000/00	000/00	single blow	8	MW	Damp	45	45.0
48	PK48	Granite	Cut Slope/Non	000/00	000/00	000/00	many blows	8	SW	Damp	60	60.0
49	PK49	Granite	Cut Slope/Fail	000/00	000/00	000/00	single blow	8	MW	Damp	45	45.0
50	PK50	Granite	Cut Slope/Fail	000/00	000/00	000/00	single blow	8	MW	Damp	50	50.0
51	PK51	Granite	Cut Slope/Fail	000/00	000/00	000/00	single blow	8	MW	Damp	45	45.0
52	PK52	Granite	Cut Slope/Non	000/00	000/00	000/00	single blow	8	MW	Damp	50	50.0
53	PK53	Granite	Cut Slope/Non	000/00	000/00	225/50 342/73 088/65	many blows	5	MW	Dry	48	47.1
54	PK54	Granite	Cut Slope/Fail	000/00	000/00	000/00	many blows	4	MW	Dry	53	53.0
55	PK55	Granite	Cut Slope/Fail	000/00	000/00	000/00	nail	4	MW	Damp	28	28.0

Appendix Table 2 Slope characteristics obtained from field investigation for evaluated RMR and SMR (Continued)

No.	STATION	ROCK	DESCRIPTION	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition	RMR	SMR
56	PK56	Granite	Cut Slope/Fail	000/00	000/00	024/71 316/68 285/80 348/65 192/50 232/37	many blows	5	Fresh	Flowing	51	44.6
57	PK57	Granite	Cut Slope/Non	000/00	000/00	000/00	many blows	8	Fresh	Damp	68	68.0
58	PK58	Granite	Cut Slope/Fail	000/00	000/00	005/35 274/40 135/85 327/89 341/85	single blow	4	MW	Flowing	25	18.6
59	PK59	Granite	Cut Slope/Fail	000/00	000/00	227/20 247/20 300/90 005/55	single blow	6	SW	Damp	48	44.4
60	PK60	Granite	Cut Slope/Non	028/70 135/75 208/87	000/00	037/62 285/80 000/70 247/80 140/70	single blow	8	SW	Damp	57	57.0
61	PK61	Granite	Cut Slope/Non	000/00	000/00	000/00	single blow	8	SW	Damp	50	50.0
62	PK62	Granite	Cut Slope/Fail	N/A	N/A	N/A	single blow	8	MW	Damp	45	45.0
63	PK63	Mud Stone	Cut Slope/Non	xxx/145	108/15	115/90 218/83 255/85	pocket knife	6	Fresh	Dry	55	53.7
64	PK64	Mud Stone	Cut Slope/Non	N/A	N/A	N/A	pocket knife	8	SW	Damp	47	47.0
65	PK65	Mud Stone	Cut Slope/Non	N/A	N/A	N/A	pocket knife	8	SW	Damp	47	47.0

Appendix Table 2 Slope characteristics obtained from field investigation for evaluated RMR and SMR (Continued)

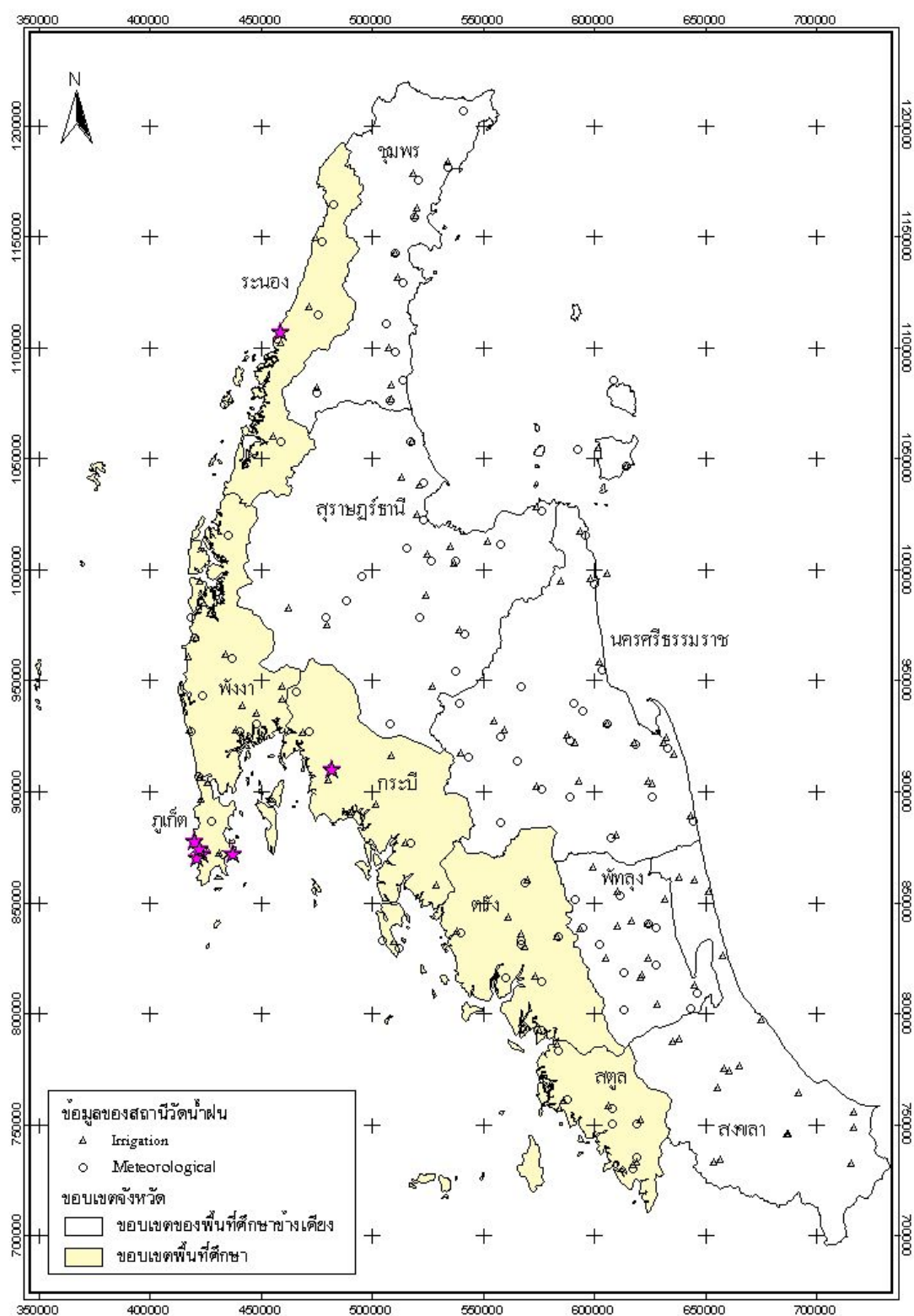
No.	STATION	ROCK	DESCRIPTION	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition	RMR	SMR
66	PK66	Mud Stone	Cut Slope/Non	000/00	225/35	125/70 183/90 259/42 109/50 043/78	many blows	4	Fresh	Damp	55	25.3
67	PK67	Granite	Cut Slope/Fail	000/00	000/00	250/77 193/70 245/60	pocket knife	4	MW	Damp	32	32.0
68	PK68	Granite	Cut Slope/Non	000/00	000/00	000/00	single blow	8	MW	Dry	52	52.0
69	PK69	Granite	Cut Slope/Non	000/00	000/00	000/00	single blow	8	MW	Damp	47	47.0
70	PK70	Granite	Cut Slope/Non	000/00	000/00	000/00	single blow	8	MW	Damp	47	47.0
71	PK71	Mud Stone	Cut Slope/Non	258/63 049/90 011/90 084/90	172/50	220/90 180/80	single blow	6	MW	Dry	43	42.1
72	PK72	Mud Stone	Cut Slope/Non	N/A	N/A	N/A	single blow	6	SW	Damp	48	48.0
73	PK73	Mud Stone	Cut Slope/Non	000/00	000/00	245/63 345/75	single blow	6	SW	Damp	48	48.0
74	PK74	Granite	Cut Slope/Fail	000/00	000/00	143/60 068/60 225/45 055/45	single blow	4	MW	Damp	32	31.1
75	PK75	Granite	Cut Slope/Fail	000/00	000/00	000/00	many blows	4	MW	Flowing	30	30.0
76	PK76	Granite	Cut Slope/Fail	010/20 232/75	000/00	285/77 185/50 230/20	many blows	4	SW	Damp	46	42.4

Appendix Table 2 Slope characteristics obtained from field investigation for evaluated RMR and SMR (Continued)

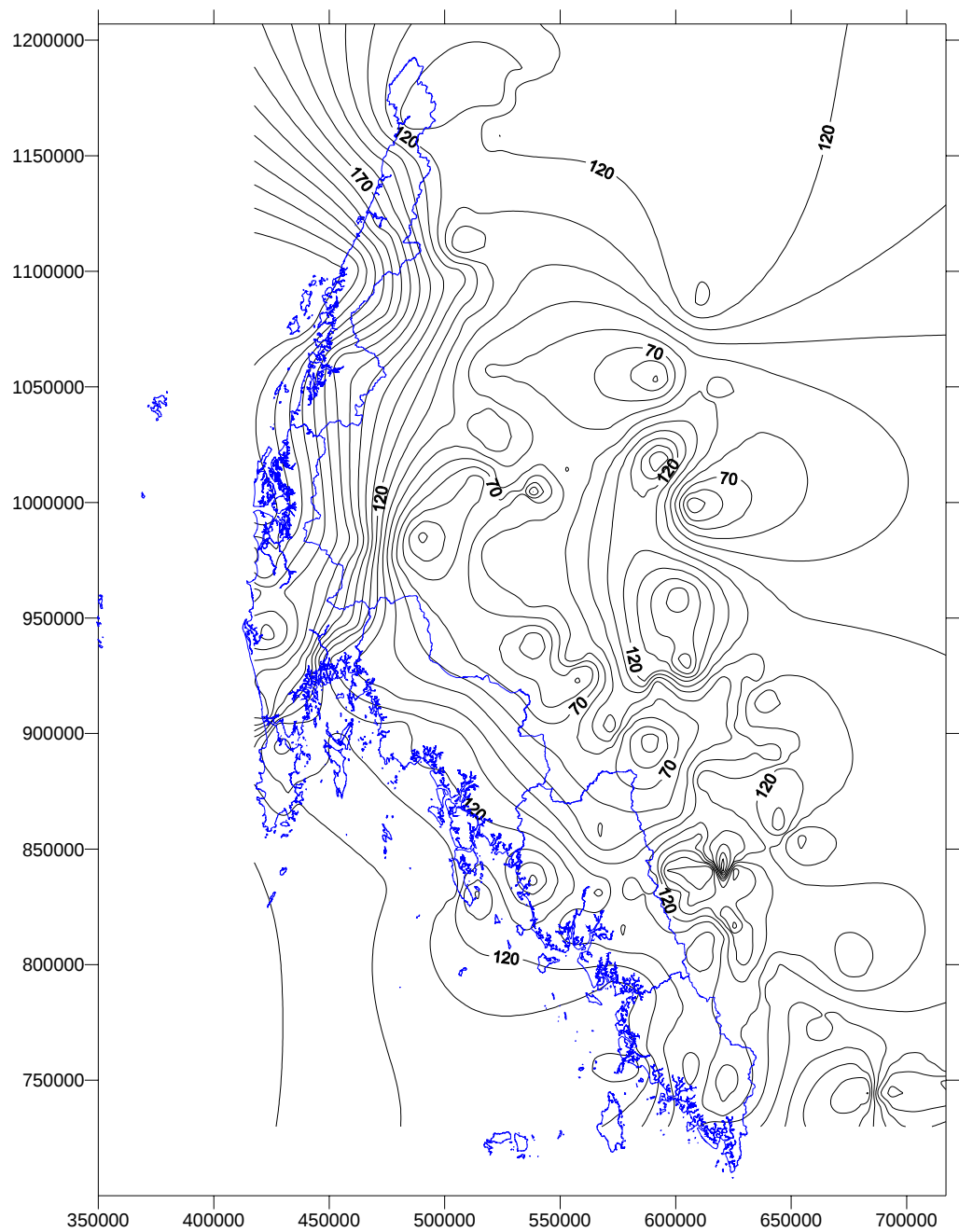
No.	STATION	ROCK	DESCRIPTION	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition	RMR	SMR
77	PK77	Granite	Cut Slope/Non	000/00	000/00	055/70 142/80 080/90 240/70 285/85	single blow	6	SW	Damp	48	48.0
78	PK78	Granite	Cut Slope/Non	000/00	000/00	055/70 142/80 080/90 240/70 285/85	single blow	6	SW	Damp	48	48.0
79	PK79	Granite	Cut Slope/Non	000/00	000/00	000/00	single blow	8	SW	Damp	57	57.0
80	PK80	Granite	Cut Slope/Non	000/00	000/00	000/00	single blow	8	SW	Damp	57	57.0
81	PK81	Granite	Cut Slope/Non	N/A	N/A	N/A	single blow	8	SW	Damp	57	57.0
82	PK82	Granite	Cut Slope/Non	N/A	N/A	N/A	many blows	8	SW	Damp	55	55.0
83	PK83	Granite	Cut Slope/Non	000/00	000/00	063/90 095/88 045/75 035/25 190/50 005/50	many blows	8	SW	Damp	69	65.4
84	PK84	Granite	Cut Slope/Non	000/00	000/00	000/00	many blows	8	SW	Dry	77	77.0
85	PK85	Granite	Cut Slope/Non	000/00	000/00	080/15 000/80 142/80	many blows	8	SW	Damp	72	70.7

Appendix Table 2 Slope characteristics obtained from field investigation for evaluated RMR and SMR (Continued)

No.	STATION	ROCK	DESCRIPTION	FAULT	BEDDING	FRACTURE	Field Estimate Rock Strength	Joint Spacing (cm)	Weathering	Ground Water Condition	RMR	SMR
86	PK86	Granite	Cut Slope/Non	000/00	000/00	080/15 000/80 142/80	many blows	8	SW	Damp	68	66.7
87	PK87	Mud Stone	Cut Slope/Non	090/86 165/60	000/00	210/80 266/80 357/75 100/20 170/65 325/50	many blows	6	SW	Damp	63	53.4

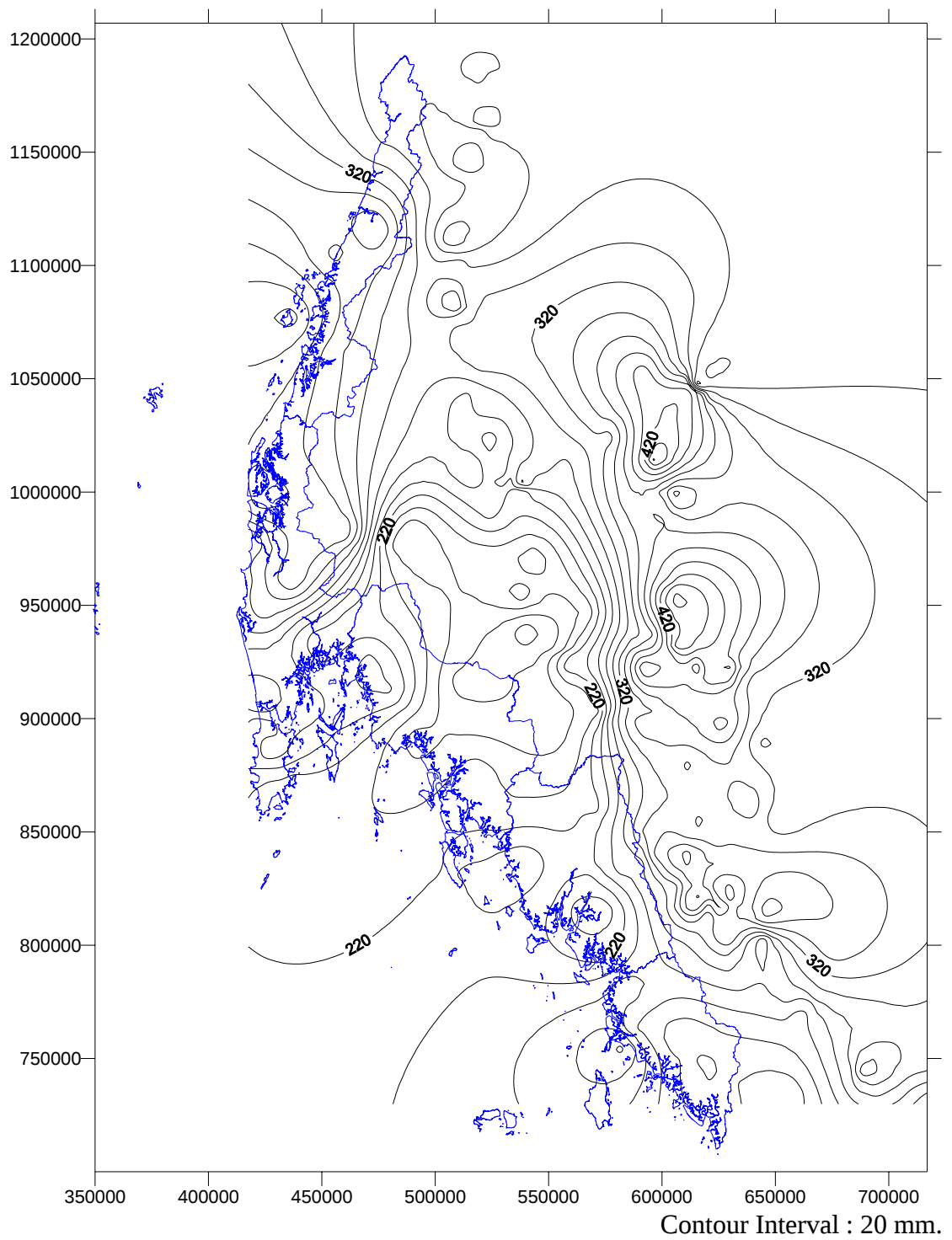


Appendix Figure 1 Raingage station

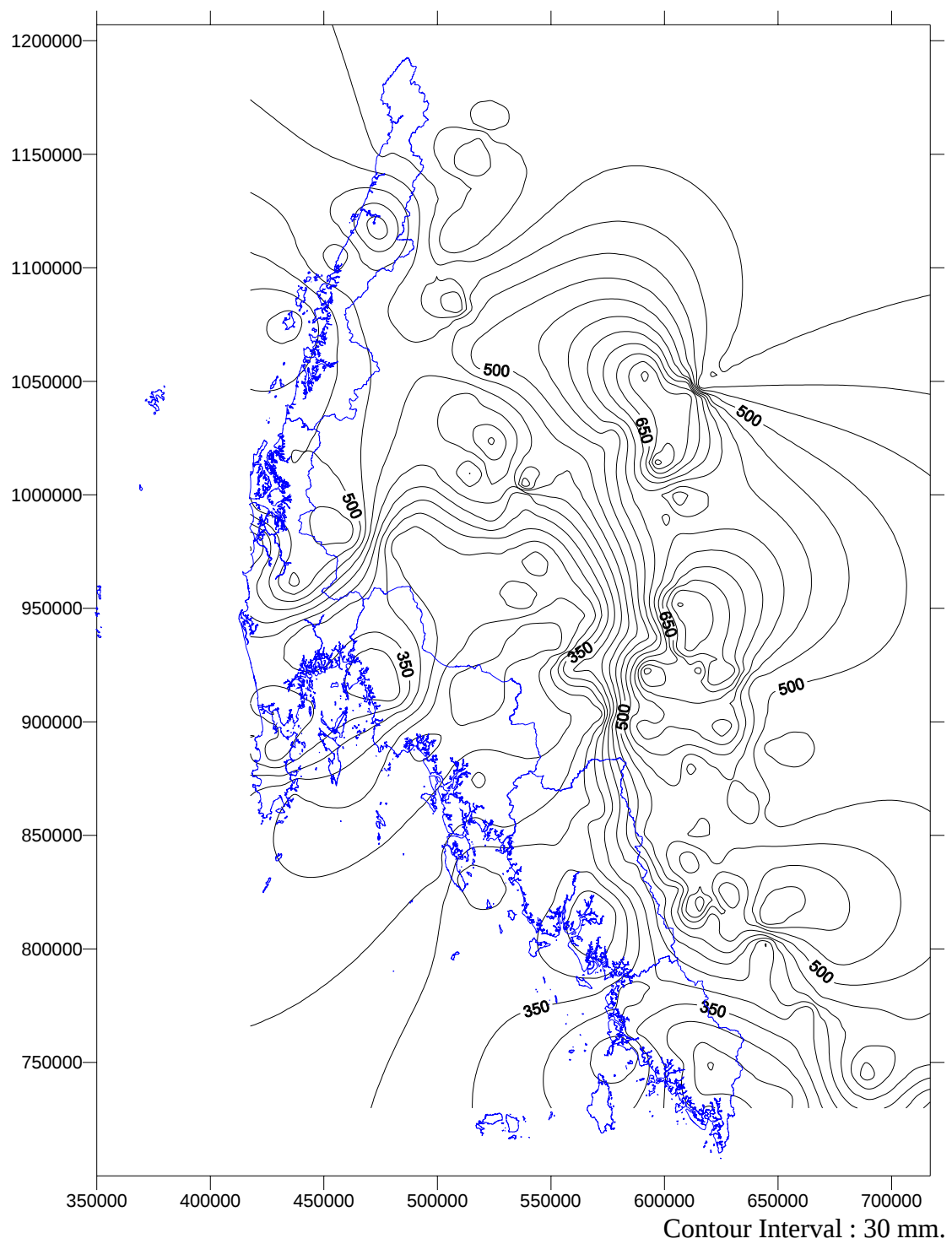


Contour Interval : 10 mm.

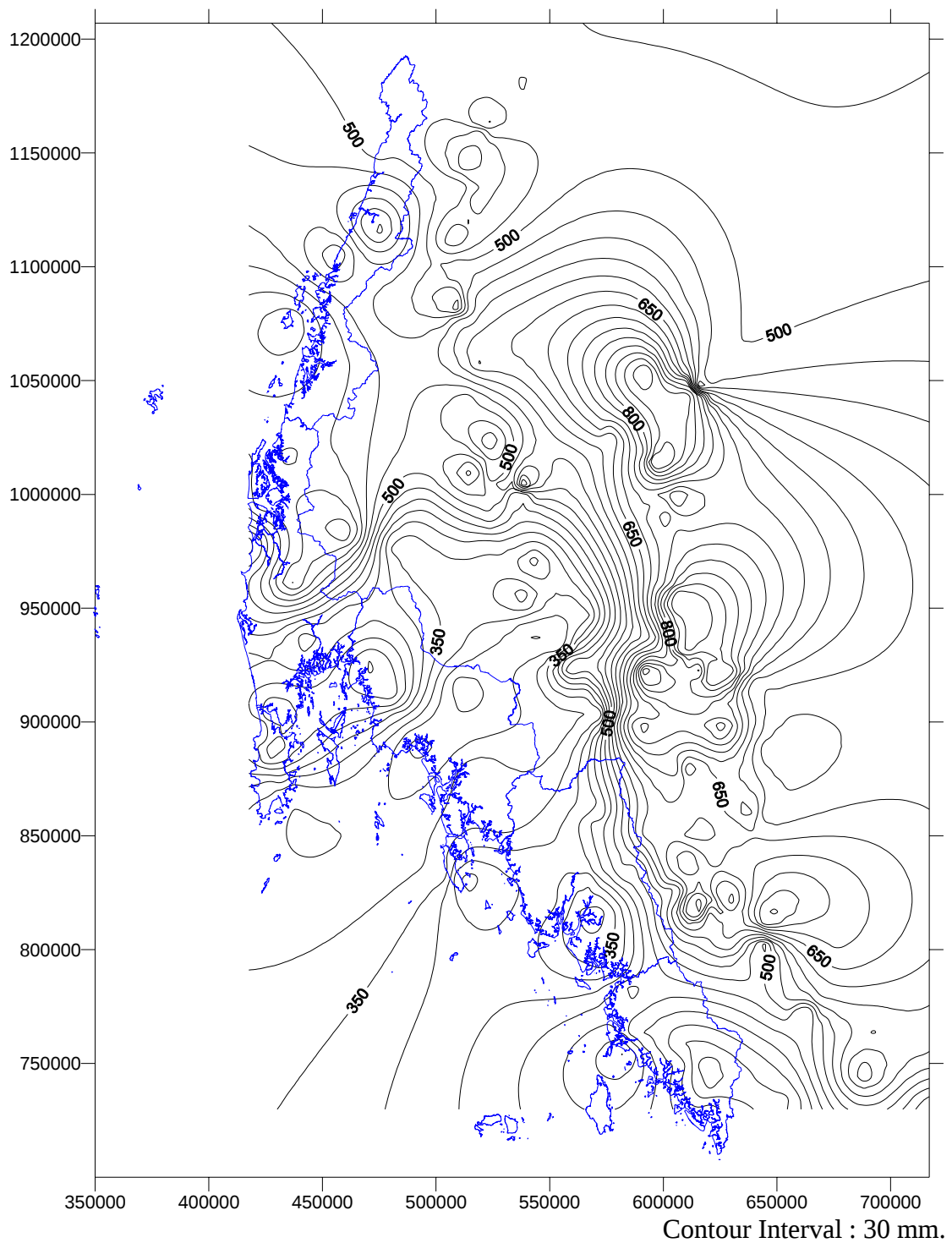
Appendix Figure 2 Cumulative rainfall intensity 3 days contour return period 1 years



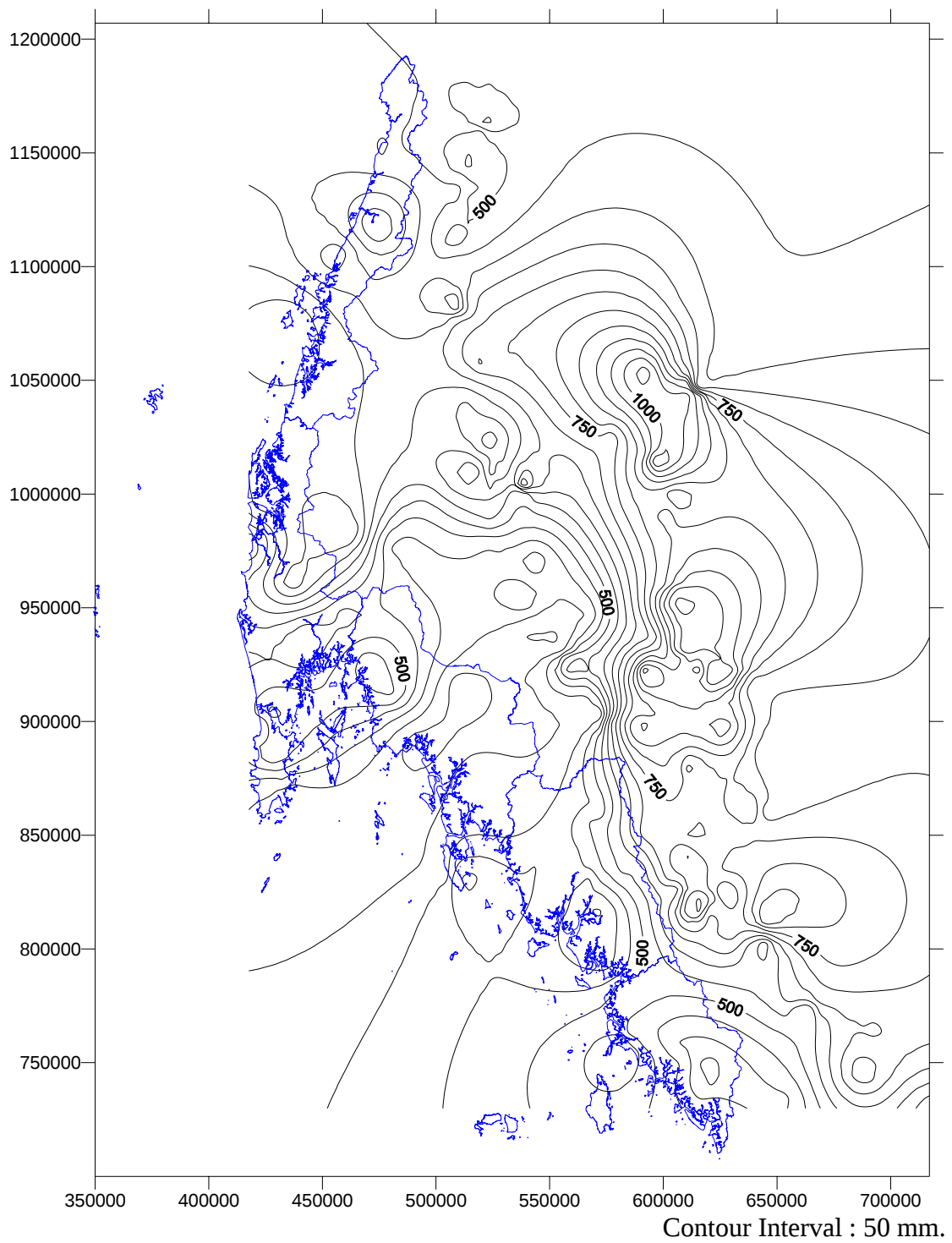
Appendix Figure 3 Cumulative rainfall intensity 3 days contour return period 5 years



Appendix Figure 4 Cumulative rainfall intensity 3 days contour
return period 20 years



Appendix Figure 5 Cumulative rainfall intensity 3 days contour
return period 50 years



Appendix Figure 6 Cumulative rainfall intensity 3 days contour
return period 100 years

Appendix Table 3 Conclusion of result USCS, Aterberg's limits, sieve analysis and direct shear test, Phuket
Source: Department of mineral resource (2006)

Position No.	Boring No.	USCS	Atterberg's Test			3/8"	#4	#8	Sieve Analysis Test				Direct Shear Test				% Reduction of Shear strength τ ₁
			LL	PL	PI				#10	#30	#50	#100	#200	Initial water content Max. Shear Stress ksc.	Wet Soil Max. Shear Stress ksc.	SRI	
Phuket																	
	SPK 2		26.60	17.29	9.31												
	SPK 02		24.69	15.80	8.89												
	SPK 03	ML	40.50	32.77	7.73	100.00	79.27	74.41	73.58	68.20	64.84	60.03	55.29	0.592	0.418	1.416	29
	SPK 03		42.17	20.49	21.68												
	SPK 03			NP													
	SPK 03		44.24	32.89	11.35	100.00	92.44	71.22	66.03	41.95	31.76	24.42	19.51				
	SPK 04			NP													
	SPK 04			NP													
	SPK 04			NP													
SPK 06	SM					100.00	99.65	98.74	97.84	88.01	82.65	74.88	68.26				
SPK 07	SM					100.00	98.20	83.07	77.44	46.88	35.71	25.79	18.67				
SPK 09	SM					100.00	88.44	74.18	69.05	42.16	33.22	25.98	20.75	0.658	0.460	1.430	30
SPK 12	SM					100.00	93.73	85.81	83.35	64.69	54.00	43.63	35.46	0.594	0.451	1.317	24
SPK 13	SM					100.00	96.13	79.86	76.70	65.33	60.34	54.35	48.99				
SPK 14						100.00	88.50	70.16	66.33	49.69	43.52	37.49	32.28				
SPK 18	SC	45.09	25.98	19.10	100.00	91.42	57.00	53.79	47.33	48.70	47.57	44.18	0.456	0.317	1.438	31	
SPK 20	MH	58.51	47.60	10.91	100.00	95.32	82.22	77.84	54.85	47.77	42.95	40.24					
SPK 20	CL	34.85	16.21	18.64	100.00	98.53	97.02	96.57	77.60	61.15	49.19	40.73					
SPK 20	SM				100.00	98.00	88.13	83.96	52.47	38.21	27.97	20.92					
SPK 20	SM				100.00	97.96	96.96	96.56	72.79	51.73	38.13	30.25					
SPK 20					100.00	99.94	99.00	98.64	83.02	70.31	62.26	55.81					
SPK 20					100.00	99.68	72.78	67.62	39.19	30.73	25.64	22.64					
SPK 21	SM				100.00	93.36	83.92	79.27	42.04	29.42	22.98	19.88		0.423	0.389	1.087	8
SPK 23	SM				100.00	35.45	27.97	26.77	20.87	18.60	16.78	14.74	0.819	0.512	1.600	37	
SPK 24	SM				100.00	99.82	99.66	99.66	88.13	60.43	38.74	26.66	0.391	0.619	0.632	37	
SPK 27	SM				100.00	98.08	83.52	78.31	53.79	44.87	37.92	32.63					
SPK 27	SM				100.00	89.82	72.35	66.81	34.96	24.41	17.76	13.85					
SPK 27					100.00	98.20	83.07	77.44	46.88	35.71	25.79	18.67					
SPK 28	SM				100.00	99.95	93.14	89.04	65.32	57.26	50.13	43.87	0.643	0.385	1.670	40	
SPK 29	SM				100.00	99.46	97.67	96.16	69.98	49.79	34.61	25.87					
SPK 32	SM				100.00	99.19	93.64	89.13	48.05	32.67	22.28	16.47					
SPK 32	CL	37.41	21.45	15.96	100.00	99.45	93.61	88.11	63.95	56.16	48.45	42.87					
SPK 32.2																	
SPK 32	CL	33.98	21.35	12.63	100.00	100.00	99.51	98.98	84.80	67.66	55.95	49.61					
SPK 33	SM				100.00	97.78	85.76	79.00	39.67	29.17	22.18	17.62					
SPK 35																	
SPK 40	SC	36.23	24.33	11.90	100.00	94.36	79.59	75.38	52.81	42.94	35.09	29.99	0.433	0.353	1.227	18	
SPK 41	SM				100.00	82.99	60.00	54.72	34.83	27.81	22.43	18.63	0.505	0.312	1.619	38	
SPK 42					100.00	98.41	86.27	81.72	54.21	43.02	32.70	25.99					
SPK 55	SM				100.00	97.00	81.08	76.43	55.34	48.64	44.10	41.18	0.480	0.131	3.664	73	
SPK 58	CL	41.72	20.69	21.03	100.00	100.00	99.87	99.72	85.50	69.30	58.11	52.31	0.595	0.320	1.859	46	
SPK 60	SM				100.00	95.93	81.50	76.36	45.61	34.41	29.27	23.90					
SPK 63		38.65	33.18	5.47	100.00	97.86	95.81	95.31	90.72	85.48	75.57	67.17	0.496	0.468	1.060	6	
SPK 67	SM				100.00	73.39	47.29	42.01	19.26	12.41	8.52	6.35					
SPK 70					100.00	94.14	82.52	79.48	61.94	53.11	44.19	36.24					
SPK 71	SM				100.00	99.80	97.69	96.43	77.36	63.12	49.65	39.14	0.550	0.437	1.259	21	
SPK 74		31.76	21.64	10.11													
SPK 74	ML	44.61	25.84	18.77	100.00	95.38	89.08	87.48	71.18	60.57	53.67	48.65					
SPK 74	ML	26.96	23.51	3.45	100.00	99.76	99.28	98.84	86.56	64.66	48.39	38.95					
SPK 74	ML	25.36	22.09	3.27	100.00	98.17	96.14	95.62	77.29	53.07	38.42	31.74					
SPK 74	SM				100.00	99.60	98.89	98.62	80.31	55.54	35.12	23.81					
SPK 74																	
SPK 76	SM				100.00	99.58	92.19	87.44	57.56	46.42	37.93	31.95					
SPK 76	SM				100.00	93.95	86.74	84.10	62.36	50.87	41.72	35.96					
SPK 76					100.00	99.01	93.65	90.09	52.58	36.92	26.43	19.64					
SPK 76					100.00	98.21	88.79	84.41	55.41	41.99	31.75	24.23	0.491	0.301	1.631	39	

Appendix Table 4 Consistency index of soil following parent rock type

Rang Consistent	Rock Type	PI	Wet Sieve Analysis	USCS	% Strength Reduction
1	Sandstone	NP	Uniform grade	SM	>50%
2	Granite	NP	Well grade	SM	<50%
3	Mudstone	NP&PI>6	Gap grade	SM&CL	20%-70%
4	Shale	PI>6	Gap grade	ML	20%-40%

Source: Department of mineral resource (2006)

Appendix Table 5 Data failure slope condition for regression analysis

No.	STATION	CONDITION	ROCKTYPE	LINEAMENT	SLOPE (degree)	ELEVATION m.	DRAINAGE	LANDUSE	SOIL/TEXTURE	ENGINEERING	INTENSITY_001 mm.	INTENSITY_100 mm.	RMR	SMR
1	PK03	Fail	5	1	28	72.93	1	3	3	4	135	387.5	19	18.10
2	PK06	Fail	4	1	27	61.51	4	4	2	3	135	362.5	27	23.81
3	PK13	Fail	5	1	18	277.14	1	3	3	4	135	462.5	31	24.63
4	PK14	Fail	5	1	15	270.49	1	3	3	4	135	462.5	26	26.00
5	PK15	Fail	5	1	27	339.69	1	1	3	4	135	462.5	25	25.00
6	PK16	Fail	5	1	14	389.57	4	1	3	4	135	462.5	25	25.00
7	PK19	Fail	5	1	24	90.92	1	4	3	4	135	437.5	33	26.63
8	PK20	Fail	5	5	27	41.96	4	4	3	4	135	437.5	34	34.00
9	PK29	Fail	5	1	22	89.82	1	1	3	4	135	412.5	31	30.10
10	PK32	Fail	5	1	29	64.01	1	3	3	4	145	362.5	37	37.00
11	PK36	Fail	5	1	27	57.30	1	4	2	4	135	437.5	28	28.00
12	PK37	Fail	5	1	23	116.64	1	1	3	4	135	412.5	22	22.00
13	PK38	Fail	5	1	23	161.43	1	4	3	4	135	412.5	37	37.00
14	PK39	Fail	5	1	16	144.66	1	4	3	4	135	412.5	37	37.00
15	PK40	Fail	5	5	14	39.90	1	4	3	4	135	412.5	45	26.94
16	PK47	Fail	5	1	18	49.23	1	4	2	4	145	387.5	45	45.00
17	PK49	Fail	5	1	12	86.85	1	1	3	4	145	387.5	45	45.00
18	PK50	Fail	5	1	6	64.22	1	4	3	4	145	387.5	50	50.00
19	PK51	Fail	5	1	7	43.45	1	4	3	4	145	387.5	45	45.00
20	PK54	Fail	5	1	24	31.18	1	3	3	4	145	387.5	53	53.00
21	PK55	Fail	5	1	25	30.29	1	3	2	4	145	387.5	28	28.00
22	PK56	Fail	5	5	29	300.00	1	4	3	4	135	412.5	51	44.63
23	PK58	Fail	5	1	13	32.80	1	3	3	4	145	362.5	25	18.63
24	PK59	Fail	5	5	28	20.00	4	1	3	4	135	437.5	48	44.40
25	PK67	Fail	5	1	24	99.47	1	4	3	4	145	337.5	32	32.00
26	PK74	Fail	5	1	25	138.76	4	1	3	4	135	387.5	32	31.10
27	PK75	Fail	5	5	15	68.98	1	4	3	4	135	387.5	30	30.00
28	PK76	Fail	5	5	21	65.05	1	4	3	4	135	387.5	46	42.40

Appendix Table 6 Data non-failure slope condition for regression analysis

No.	STATION	CONDITION	ROCKTYPE	LINEAMENT	SLOPE (degree)	ELEVATION m.	DRAINAGE	LANDUSE	SOILTEXTURE	ENGINEERING	INTENSITY_001 mm.	INTENSITY_100 mm.	RMR	SMR
1	PK05	No Fail	4	1	33	34.72	1	3	2	3	135	337.5	72	72.00
2	PK21	No Fail	5	1	25	112.33	1	4	3	4	135	437.5	60	60.00
3	PK23	No Fail	5	5	28	109.37	1	4	3	4	125	437.5	60	56.40
4	PK24	No Fail	5	1	37	229.65	1	1	3	4	135	412.5	52	47.80
5	PK25	No Fail	5	5	19	168.97	1	1	3	4	135	437.5	61	61.00
6	PK27	No Fail	5	1	19	201.84	4	1	3	4	135	387.5	60	59.10
7	PK31	No Fail	5	1	16	95.74	4	4	3	4	135	362.5	46	46.00
8	PK33	No Fail	5	1	25	66.54	1	4	3	4	145	362.5	42	42.00
9	PK41	No Fail	5	5	11	140.00	4	4	3	4	135	362.5	32	31.10
10	PK43	No Fail	5	1	20	181.73	4	4	3	4	135	362.5	42	41.10
11	PK44	No Fail	5	1	20	140.54	1	4	3	4	135	362.5	50	50.00
12	PK45	No Fail	5	1	13	61.83	4	4	3	4	125	487.5	60	59.10
13	PK46	No Fail	5	1	23	71.57	1	1	3	4	125	487.5	55	55.00
14	PK48	No Fail	5	1	23	62.55	1	1	2	4	145	387.5	60	60.00
15	PK52	No Fail	5	1	16	60.00	1	1	3	4	145	387.5	50	50.00
16	PK53	No Fail	5	1	20	20.20	1	3	3	4	145	387.5	48	47.10
17	PK57	No Fail	5	1	17	162.61	4	4	3	4	135	412.5	68	68.00
18	PK60	No Fail	5	5	18	40.00	4	4	3	4	125	487.5	57	57.00
19	PK61	No Fail	0	5	22	109.64	1	4	0	0	125	487.5	50	50.00
20	PK63	No Fail	4	5	22	43.59	4	3	2	3	135	337.5	55	53.65
21	PK66	No Fail	4	1	30	102.78	1	4	2	3	145	312.5	55	25.25
22	PK68	No Fail	5	1	23	100.00	1	4	3	4	135	437.5	52	52.00
23	PK69	No Fail	4	5	31	108.09	1	1	2	3	135	437.5	47	47.00
24	PK70	No Fail	4	5	25	101.34	4	1	2	3	135	437.5	47	47.00
25	PK71	No Fail	4	5	9	60.00	4	4	2	3	135	437.5	43	42.10
26	PK73	No Fail	4	5	17	94.62	4	4	2	3	135	437.5	48	48.00
27	PK77	No Fail	5	5	22	121.50	1	4	3	4	125	487.5	48	48.00
28	PK78	No Fail	5	1	19	117.78	1	4	3	4	125	487.5	48	48.00

Appendix Table 6 Data non-failure slope condition for regression analysis (Continued)

No.	STATION	CONDITION	ROCKTYPE	LINEAMENT	SLOPE (degree)	ELEVATION m.	DRAINAGE	LANDUSE	SOILTEXTURE	ENGINEERING	INTENSITY_001 mm.	INTENSITY_100 mm.	RMR	SMR
29	PK79	No Fail	5	1	20	73.63	1	4	2	4	135	487.5	57	57.00
30	PK80	No Fail	5	1	23	44.62	4	4	2	4	135	487.5	57	57.00
31	PK83	No Fail	5	5	10	38.31	4	4	1	4	125	437.5	69	65.40
32	PK84	No Fail	5	1	30	74.98	1	4	3	4	125	437.5	77	77.00
33	PK85	No Fail	5	1	20	99.50	1	4	3	4	125	437.5	72	70.65
34	PK86	No Fail	5	1	22	102.70	1	4	3	4	125	437.5	68	66.65
35	PK87	No Fail	5	5	34	92.24	1	4	3	4	135	412.5	63	53.40

CURRICULUM VITAE

NAME : Mr. Damrong Pungsuwan

BIRTH DATE : July 9, 1976

BIRTH PLACE : Chiang mai, Thailand

EDUCATION	: <u>YEAR</u>	<u>INSTITUTION</u>	<u>DEGREE/DIPLOMA</u>
	1999	Chiang mai Univ.	B.S. Eng. (Civil)
	2003	Sukhothai thammathirat Univ.	B.B.A. (Construction Management)

POSITION/TITLE : Civil Engineer

WORK PLACE : Engineering Design Consultant Co.Ltd.