Appendix-C17-02

Results of Swedish Weight Soundings Logs

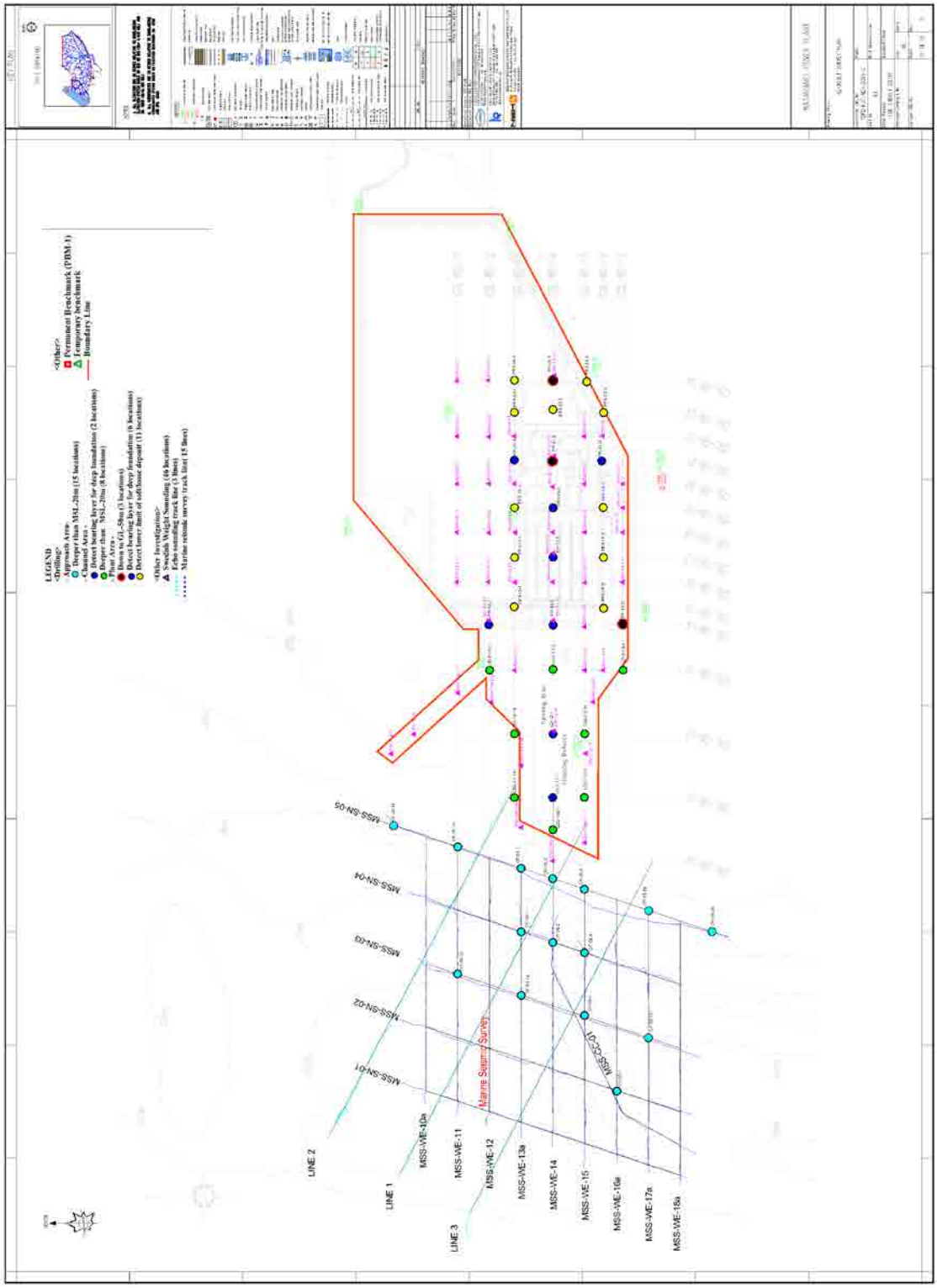


Figure 2 Locations of site investigation points and line

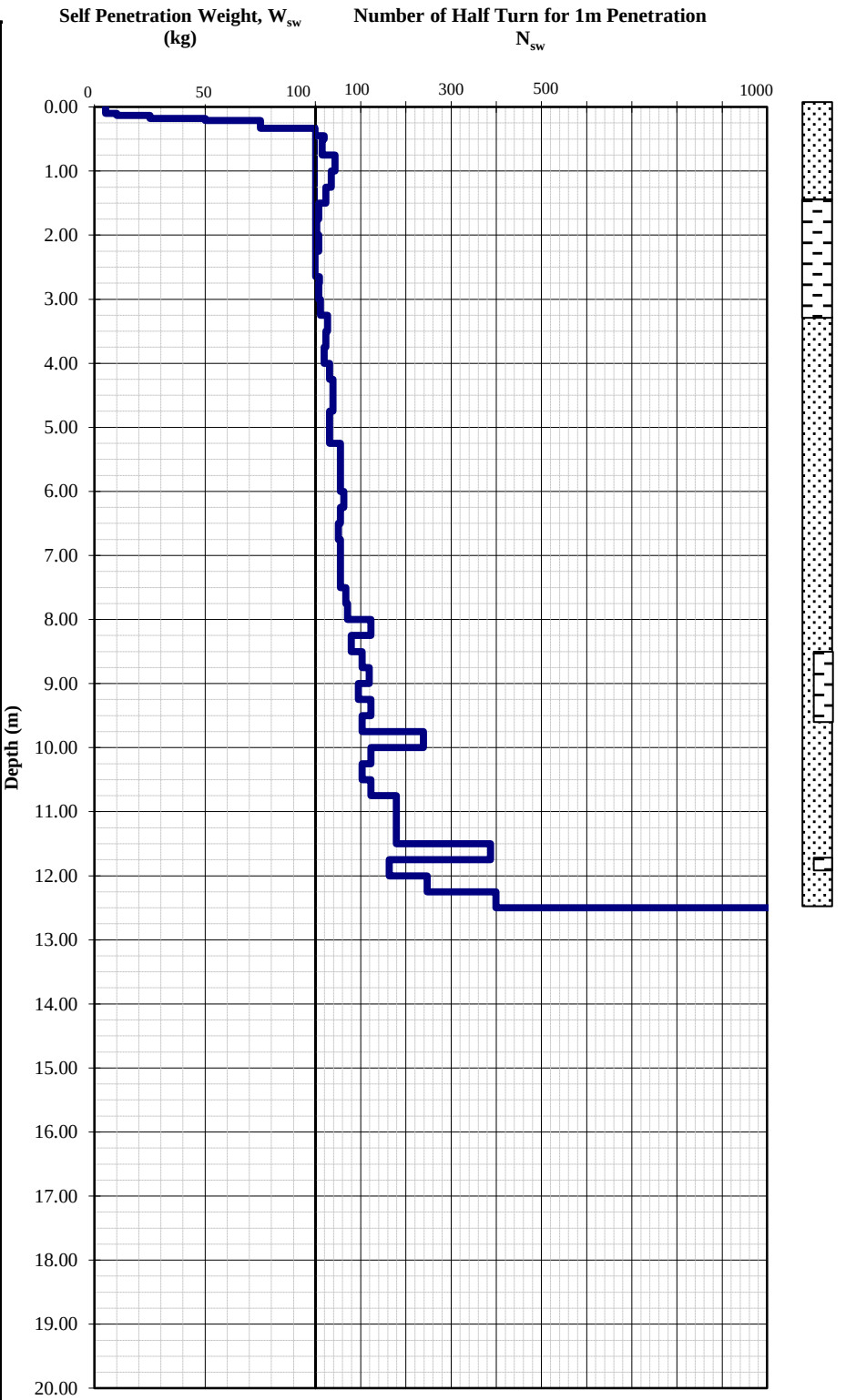
1

Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-10a-13a
Location : N 2400321.06: E 382480.85
Ground Level : +0.42mMSL

Tested Date : 2014/10/27to 10/28
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.10	5	N.A.	10	N.A.
0.10 - 0.13	10	N.A.	3	N.A.
0.13 - 0.18	25	N.A.	5	N.A.
0.18 - 0.21	50	N.A.	3	N.A.
0.21 - 0.33	75	N.A.	12	N.A.
0.33 - 0.45	100	N.A.	12	N.A.
0.45 - 0.50	100	1	5	20
0.50 - 0.75	100	4	25	16
0.75 - 1.00	100	11	25	44
1.00 - 1.25	100	9	25	36
1.25 - 1.50	100	6	25	24
1.50 - 1.75	100	2	25	8
1.75 - 2.00	100	1	25	4
2.00 - 2.25	100	2	25	8
2.25 - 2.50	100	N.A.	25	N.A.
2.50 - 2.65	100	N.A.	15	N.A.
2.65 - 2.75	100	1	10	10
2.75 - 3.00	100	2	25	8
3.00 - 3.25	100	3	25	12
3.25 - 3.50	100	7	25	28
3.50 - 3.75	100	6	25	24
3.75 - 4.00	100	5	25	20
4.00 - 4.25	100	8	25	32
4.25 - 4.50	100	10	25	40
4.50 - 4.75	100	10	25	40
4.75 - 5.00	100	8	25	32
5.00 - 5.25	100	8	25	32
5.25 - 5.50	100	14	25	56
5.50 - 5.75	100	14	25	56
5.75 - 6.00	100	14	25	56
6.00 - 6.25	100	16	25	64
6.25 - 6.50	100	14	25	56
6.50 - 6.75	100	13	25	52
6.75 - 7.00	100	14	25	56
7.00 - 7.25	100	14	25	56
7.25 - 7.50	100	14	25	56
7.50 - 7.75	100	17	25	68
7.75 - 8.00	100	18	25	72
8.00 - 8.25	100	31	25	124
8.25 - 8.50	100	20	25	80
8.50 - 8.75	100	26	25	104
8.75 - 9.00	100	30	25	120
9.00 - 9.25	100	24	25	96
9.25 - 9.50	100	31	25	124
9.50 - 9.75	100	26	25	104
9.75 - 10.00	100	60	25	240
10.00 - 10.25	100	31	25	124
10.25 - 10.50	100	26	25	104
10.50 - 10.75	100	31	25	124
10.75 - 11.00	100	45	25	180
11.00 - 11.25	100	45	25	180
11.25 - 11.50	100	45	25	180
11.50 - 11.75	100	97	25	388
11.75 - 12.00	100	41	25	164
12.00 - 12.25	100	62	25	248
12.25 - 12.50	100	100	25	400
12.50 - 12.58	100	100	7	1333

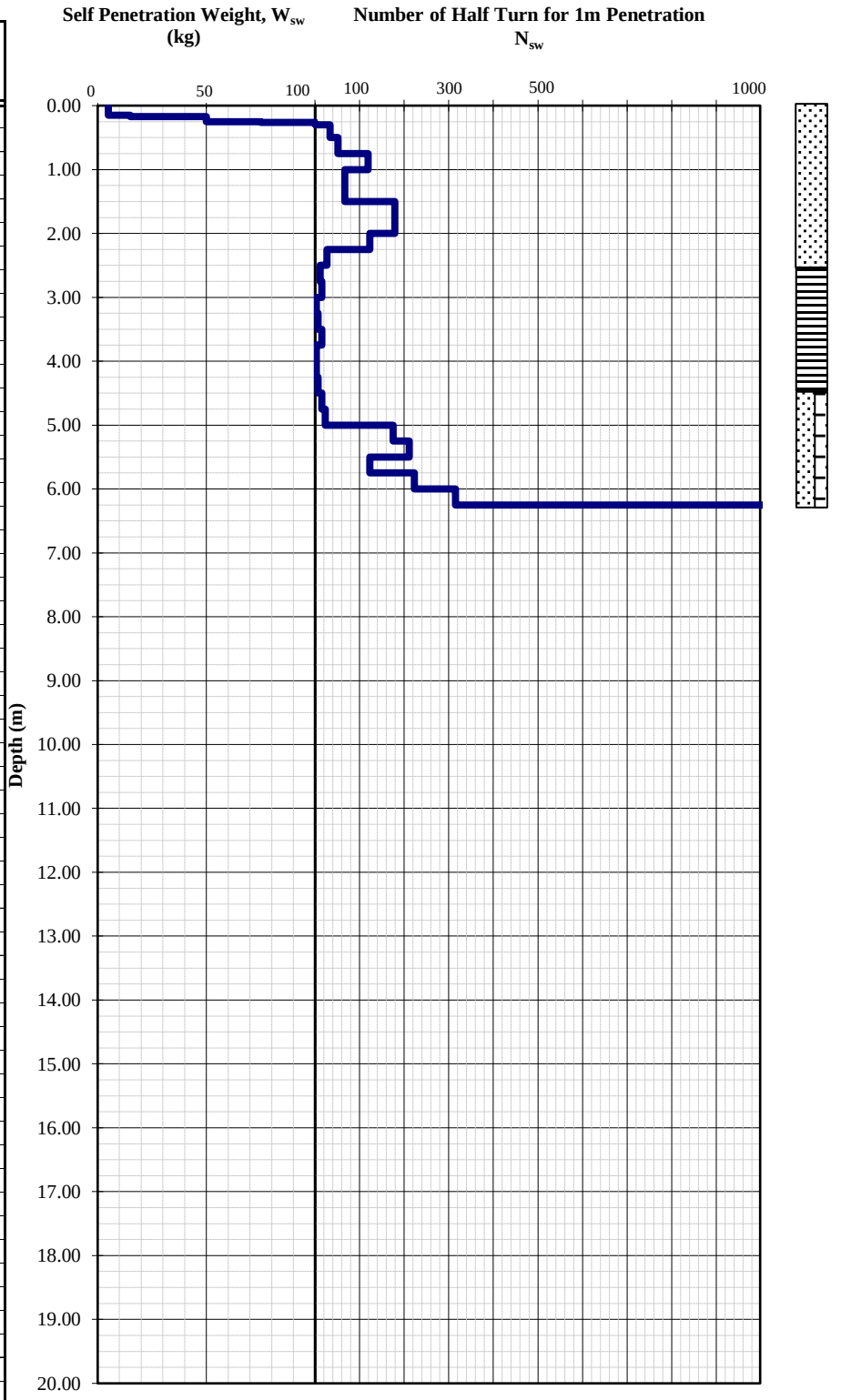


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-10a-14
Location : N 2400119.57: E 382270.29
Ground Level : +1.17mMSL

Tested Date : 2-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.15	5	N.A.	15	N.A.
0.15 - 0.17	15	N.A.	2	N.A.
0.17 - 0.17	25	N.A.	0	N.A.
0.17 - 0.25	50	N.A.	8	N.A.
0.25 - 0.26	75	N.A.	1	N.A.
0.26 - 0.30	100	N.A.	4	N.A.
0.30 - 0.50	100	7	20	35
0.50 - 0.75	100	13	25	52
0.75 - 1.00	100	30	25	120
1.00 - 1.25	100	17	25	68
1.25 - 1.50	100	17	25	68
1.50 - 1.75	100	45	25	180
1.75 - 2.00	100	45	25	180
2.00 - 2.25	100	31	25	124
2.25 - 2.50	100	7	25	28
2.50 - 2.75	100	3	25	12
2.75 - 3.00	100	4	25	16
3.00 - 3.25	100	1	25	4
3.25 - 3.50	100	2	25	8
3.50 - 3.75	100	4	25	16
3.75 - 4.00	100	1	25	4
4.00 - 4.25	100	1	25	4
4.25 - 4.50	100	2	25	8
4.50 - 4.75	100	4	25	16
4.75 - 5.00	100	6	25	24
5.00 - 5.25	100	44	25	176
5.25 - 5.50	100	53	25	212
5.50 - 5.75	100	31	25	124
5.75 - 6.00	100	56	25	224
6.00 - 6.25	100	79	25	316
6.25 - 6.39	100	150	14	1071

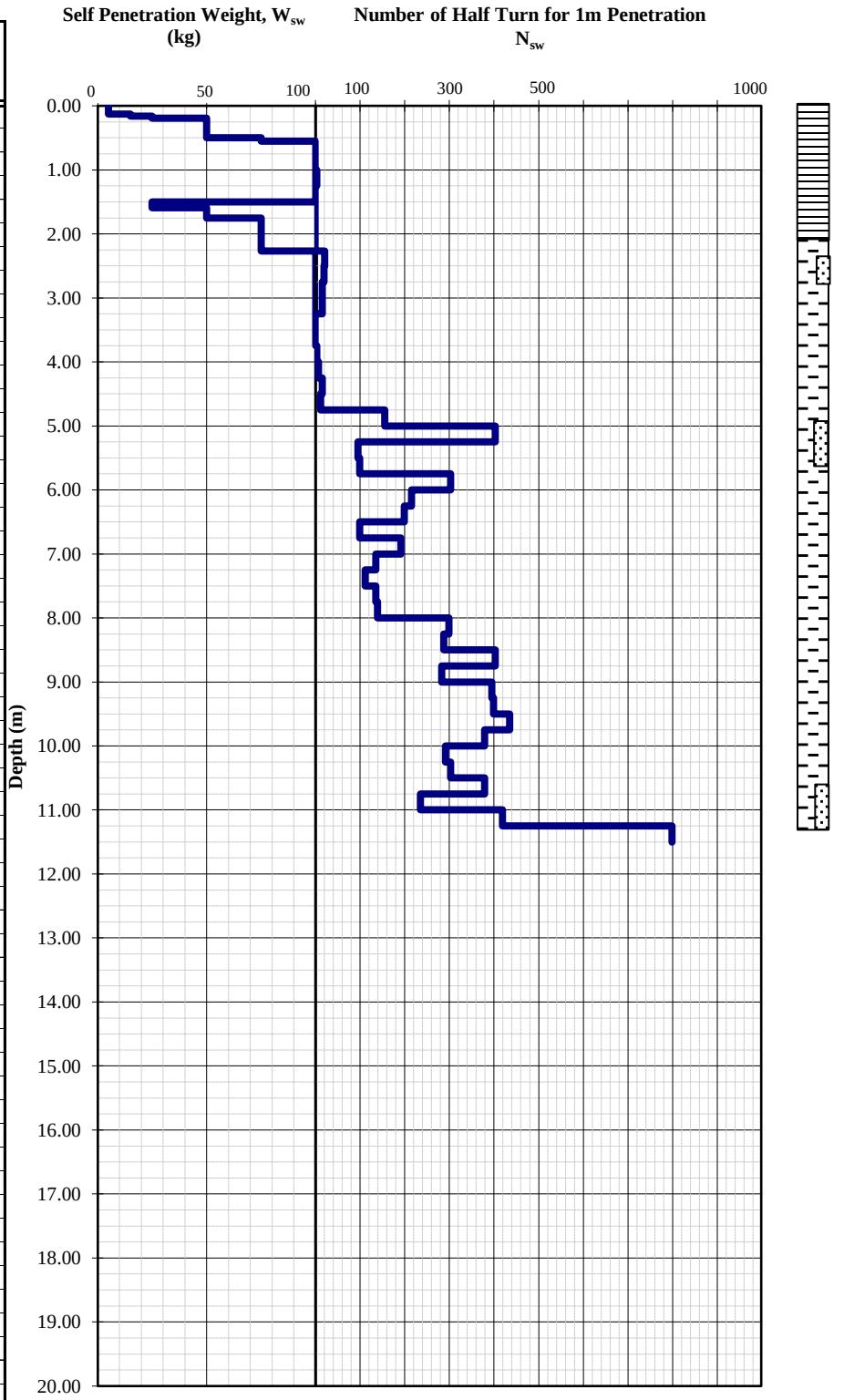


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-10a-15
Location : N2399919.98 : E 382384.63
Ground Level : +1.37mMSL

Tested Date : 2014/10/28 to 10/29
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.13	5	N.A.	13	N.A.
0.13 - 0.16	15	N.A.	3	N.A.
0.16 - 0.19	25	N.A.	3	N.A.
0.19 - 0.50	50	N.A.	31	N.A.
0.50 - 0.55	75	N.A.	5	N.A.
0.55 - 1.00	100	N.A.	45	N.A.
1.00 - 1.25	100	1	25	4
1.25 - 1.50	100	N.A.	25	N.A.
1.50 - 1.59	25	N.A.	9	N.A.
1.59 - 1.75	50	N.A.	16	N.A.
1.75 - 2.00	75	N.A.	25	N.A.
2.00 - 2.27	75	N.A.	27	N.A.
2.27 - 2.27	100	N.A.	0	N.A.
2.27 - 2.50	100	5	23	22
2.50 - 2.75	100	5	25	20
2.75 - 3.00	100	4	25	16
3.00 - 3.25	100	4	25	16
3.25 - 3.50	100	N.A.	25	N.A.
3.50 - 3.75	100	N.A.	25	N.A.
3.75 - 4.00	100	1	25	4
4.00 - 4.25	100	2	25	8
4.25 - 4.50	100	4	25	16
4.50 - 4.75	100	3	25	12
4.75 - 5.00	100	39	25	156
5.00 - 5.25	100	101	25	404
5.25 - 5.50	100	24	25	96
5.50 - 5.75	100	25	25	100
5.75 - 6.00	100	76	25	304
6.00 - 6.25	100	54	25	216
6.25 - 6.50	100	50	25	200
6.50 - 6.75	100	25	25	100
6.75 - 7.00	100	48	25	192
7.00 - 7.25	100	34	25	136
7.25 - 7.50	100	28	25	112
7.50 - 7.75	100	34	25	136
7.75 - 8.00	100	35	25	140
8.00 - 8.25	100	75	25	300
8.25 - 8.50	100	72	25	288
8.50 - 8.75	100	101	25	404
8.75 - 9.00	100	71	25	284
9.00 - 9.25	100	99	25	396
9.25 - 9.50	100	100	25	400
9.50 - 9.75	100	109	25	436
9.75 - 10.00	100	95	25	380
10.00 - 10.25	100	73	25	292
10.25 - 10.50	100	76	25	304
10.50 - 10.75	100	95	25	380
10.75 - 11.00	100	59	25	236
11.00 - 11.25	100	105	25	420
11.25 - 11.50	100	200	25	800
-				
-				
-				
-				
-				
-				
-				

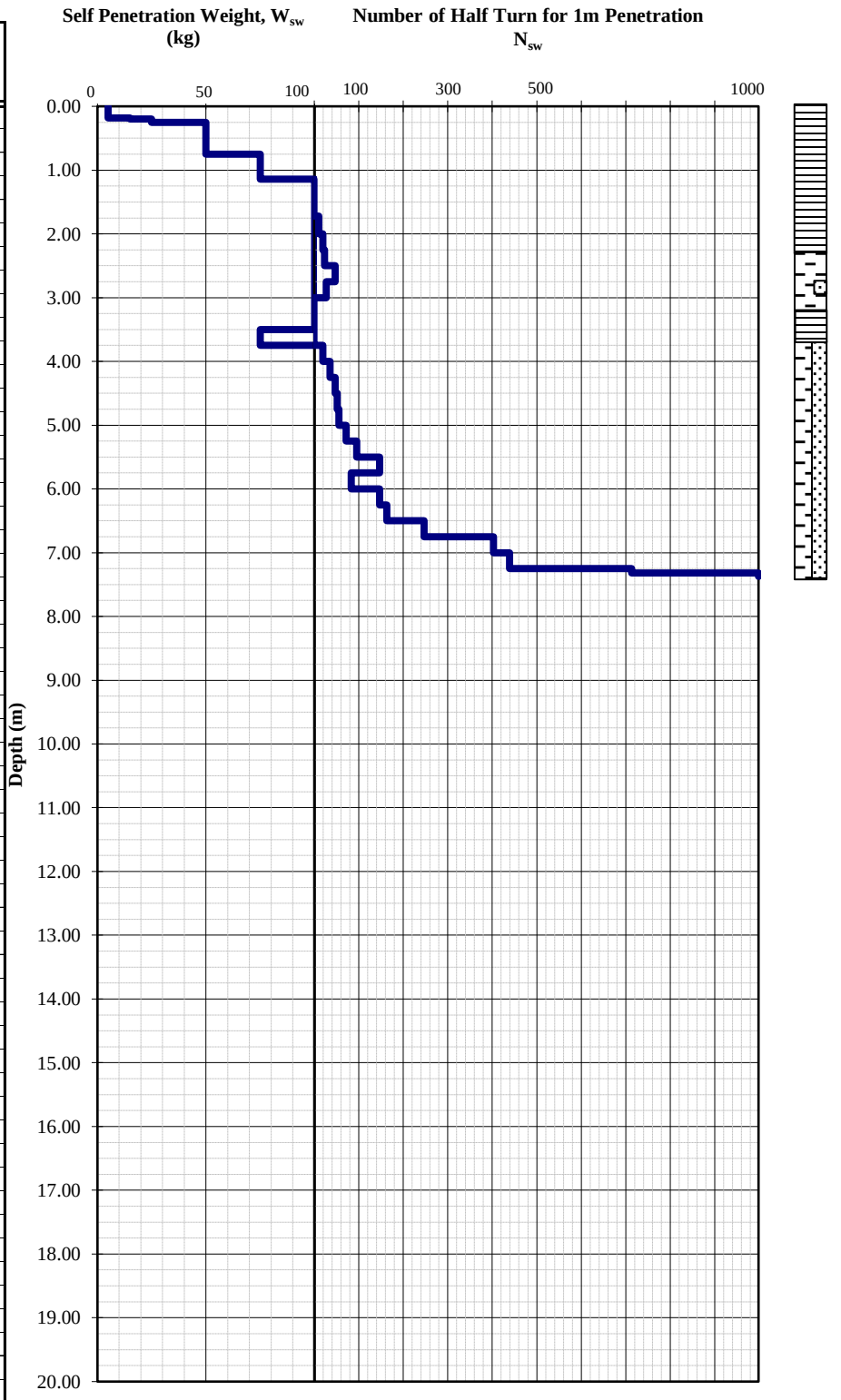


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-11a-9
Location : N2401138.27 : E 382944.51
Ground Level : -0.78mMSL

Tested Date : 1-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.18	5	N.A.	18	N.A.
0.18 - 0.20	15	N.A.	2	N.A.
0.20 - 0.25	25	N.A.	5	N.A.
0.25 - 0.75	50	N.A.	50	N.A.
0.75 - 1.14	75	N.A.	39	N.A.
1.14 - 1.72	100	N.A.	58	N.A.
1.72 - 2.00	100	3	28	11
2.00 - 2.25	100	5	25	20
2.25 - 2.50	100	6	25	24
2.50 - 2.75	100	12	25	48
2.75 - 3.00	100	7	25	28
3.00 - 3.50	100	N.A.	50	N.A.
3.50 - 3.75	75	N.A.	25	N.A.
3.75 - 3.75	100	N.A.	0	N.A.
3.75 - 4.00	100	5	25	20
4.00 - 4.25	100	9	25	36
4.25 - 4.50	100	12	25	48
4.50 - 4.75	100	13	25	52
4.75 - 5.00	100	14	25	56
5.00 - 5.25	100	18	25	72
5.25 - 5.50	100	24	25	96
5.50 - 5.75	100	37	25	148
5.75 - 6.00	100	21	25	84
6.00 - 6.25	100	37	25	148
6.25 - 6.50	100	41	25	164
6.50 - 6.75	100	62	25	248
6.75 - 7.00	100	101	25	404
7.00 - 7.25	100	110	25	440
7.25 - 7.32	100	50	7	714
7.32 - 7.37	100	50	5	1000

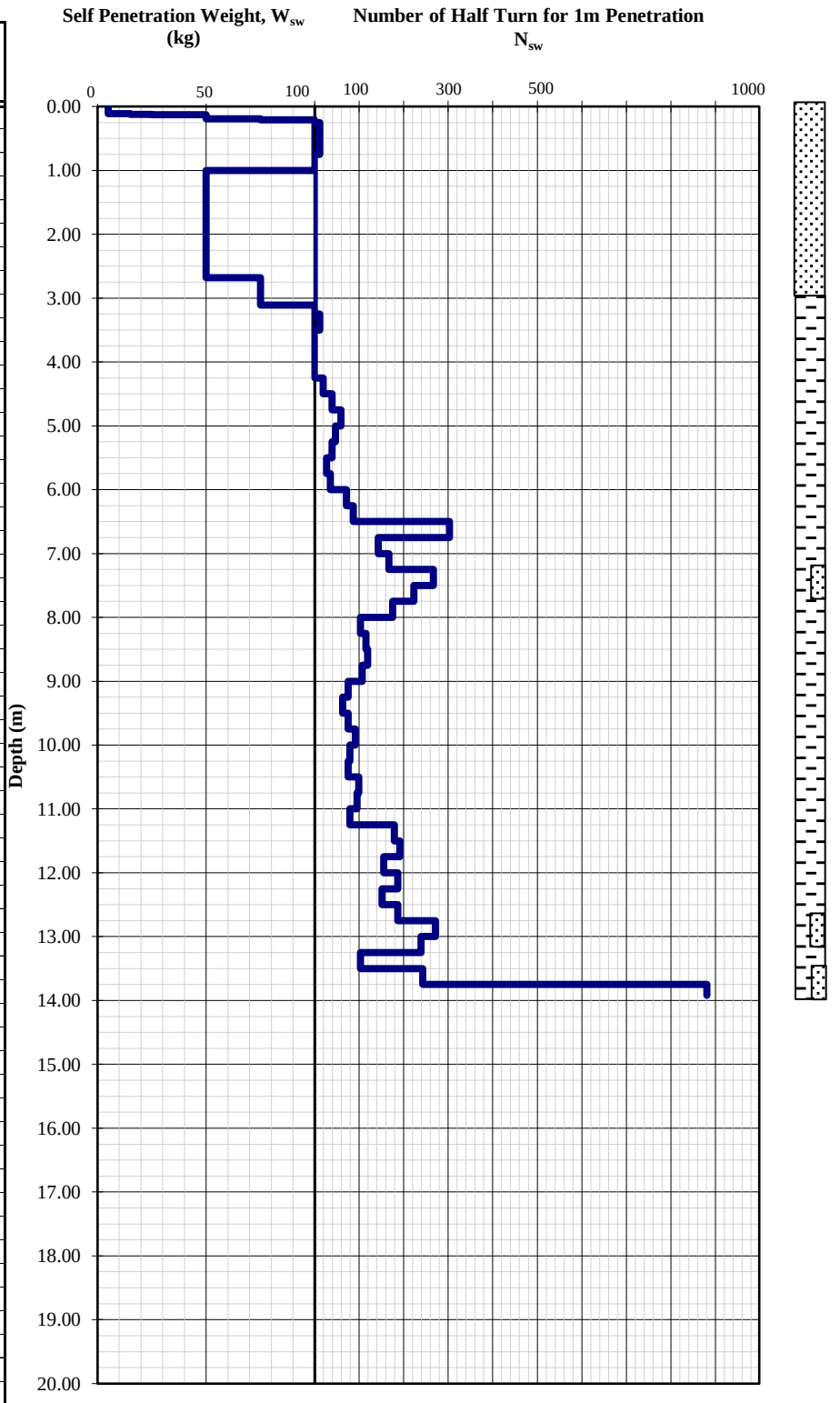


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-11a-13a
Location : N 2400319.97: E 382869.29
Ground Level : +1.53mMSL

Tested Date : 30-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.11	5	N.A.	11	N.A.
0.11 - 0.12	15	N.A.	1	N.A.
0.12 - 0.13	25	N.A.	1	N.A.
0.13 - 0.19	50	N.A.	6	N.A.
0.19 - 0.21	75	N.A.	2	N.A.
0.21 - 0.25	100	N.A.	4	N.A.
0.25 - 0.50	100	3	25	12
0.50 - 0.75	100	3	25	12
0.75 - 1.00	100	N.A.	25	N.A.
1.00 - 1.50	50	N.A.	50	N.A.
1.50 - 2.00	50	N.A.	50	N.A.
2.00 - 2.50	50	N.A.	50	N.A.
2.50 - 2.68	50	N.A.	18	N.A.
2.68 - 3.00	75	N.A.	32	N.A.
3.00 - 3.11	75	N.A.	11	N.A.
3.11 - 3.25	100	N.A.	14	N.A.
3.25 - 3.50	100	3	25	12
3.50 - 4.00	100	N.A.	50	N.A.
4.00 - 4.25	100	N.A.	25	N.A.
4.25 - 4.50	100	5	25	20
4.50 - 4.75	100	10	25	40
4.75 - 5.00	100	15	25	60
5.00 - 5.25	100	12	25	48
5.25 - 5.50	100	10	25	40
5.50 - 5.75	100	7	25	28
5.75 - 6.00	100	9	25	36
6.00 - 6.25	100	18	25	72
6.25 - 6.50	100	22	25	88
6.50 - 6.75	100	76	25	304
6.75 - 7.00	100	36	25	144
7.00 - 7.25	100	42	25	168
7.25 - 7.50	100	67	25	268
7.50 - 7.75	100	56	25	224
7.75 - 8.00	100	44	25	176
8.00 - 8.25	100	26	25	104
8.25 - 8.50	100	29	25	116
8.50 - 8.75	100	30	25	120
8.75 - 9.00	100	27	25	108
9.00 - 9.25	100	19	25	76
9.25 - 9.50	100	16	25	64
9.50 - 9.75	100	19	25	76
9.75 - 10.00	100	23	25	92
10.00 - 10.25	100	20	25	80
10.25 - 10.50	100	19	25	76
10.50 - 10.75	100	25	25	100
10.75 - 11.00	100	24	25	96
11.00 - 11.25	100	20	25	80
11.25 - 11.50	100	45	25	180
11.50 - 11.75	100	48	25	192
11.75 - 12.00	100	39	25	156
12.00 - 12.25	100	47	25	188
12.25 - 12.50	100	38	25	152
12.50 - 12.75	100	47	25	188
12.75 - 13.00	100	68	25	272
13.00 - 13.25	100	60	25	240
13.25 - 13.50	100	26	25	104
13.50 - 13.75	100	61	25	244
13.75 - 13.92	100	150	17	882
-				
-				
-				

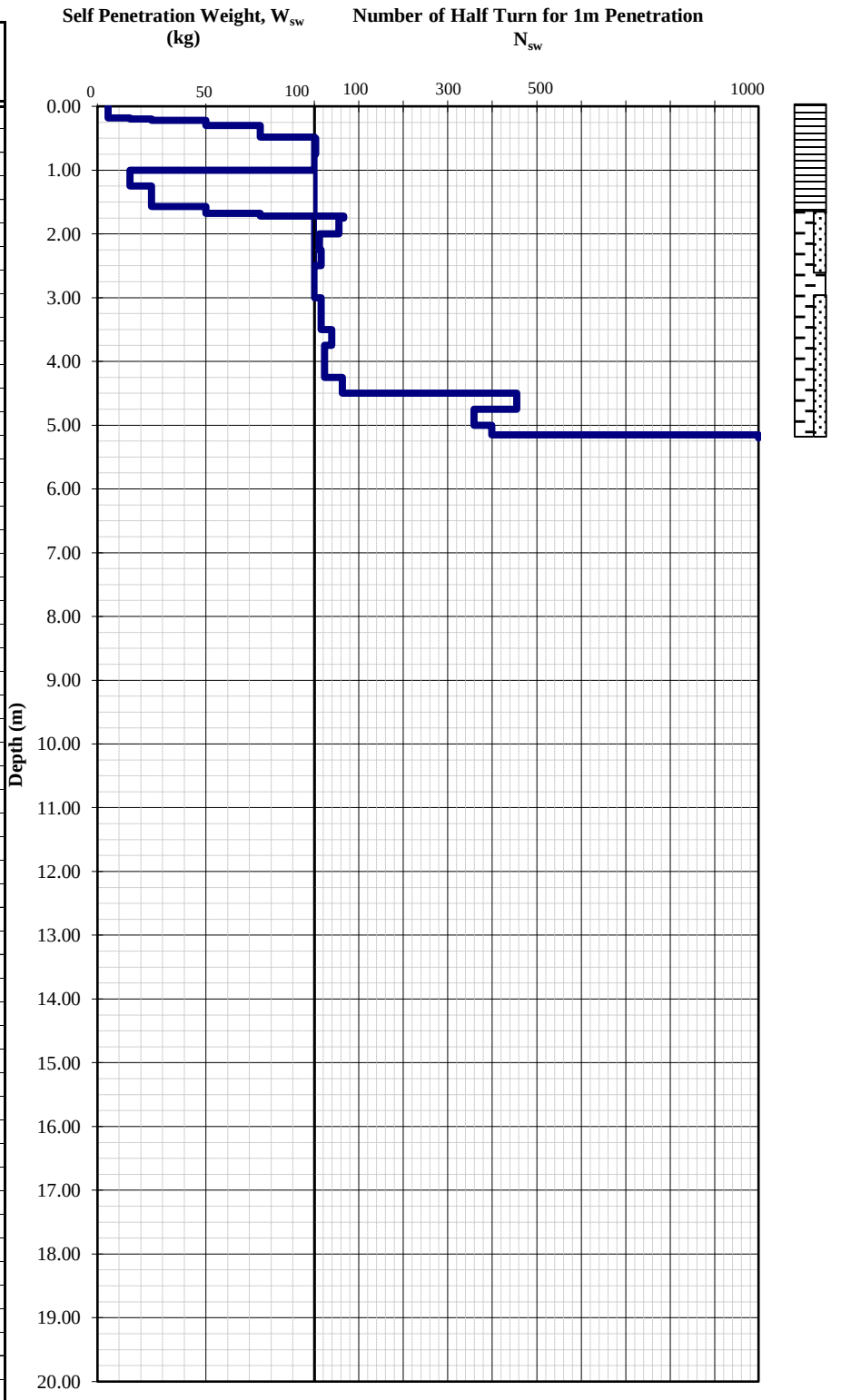


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-11a-15
Location : N2399912.91 : E 382945.54
Ground Level : +1.07mMSL

Tested Date : 24-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.18	5	N.A.	18	N.A.
0.18 - 0.20	15	N.A.	2	N.A.
0.20 - 0.22	25	N.A.	2	N.A.
0.22 - 0.30	50	N.A.	8	N.A.
0.30 - 0.48	75	N.A.	18	N.A.
0.48 - 0.50	100	N.A.	2	N.A.
0.50 - 0.75	100	1	25	4
0.75 - 1.00	100	N.A.	25	N.A.
1.00 - 1.25	15	N.A.	25	N.A.
1.25 - 1.57	25	N.A.	32	N.A.
1.57 - 1.68	50	N.A.	11	N.A.
1.68 - 1.72	75	N.A.	4	N.A.
1.72 - 1.72	100	N.A.	0	N.A.
1.72 - 1.75	100	2	3	67
1.75 - 2.00	100	14	25	56
2.00 - 2.25	100	3	25	12
2.25 - 2.50	100	4	25	16
2.50 - 3.00	100	N.A.	50	N.A.
3.00 - 3.25	100	4	25	16
3.25 - 3.50	100	4	25	16
3.50 - 3.75	100	10	25	40
3.75 - 4.00	100	6	25	24
4.00 - 4.25	100	6	25	24
4.25 - 4.50	100	16	25	64
4.50 - 4.75	100	114	25	456
4.75 - 5.00	100	90	25	360
5.00 - 5.15	100	60	15	400
5.15 - 5.20	100	50	5	1000
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

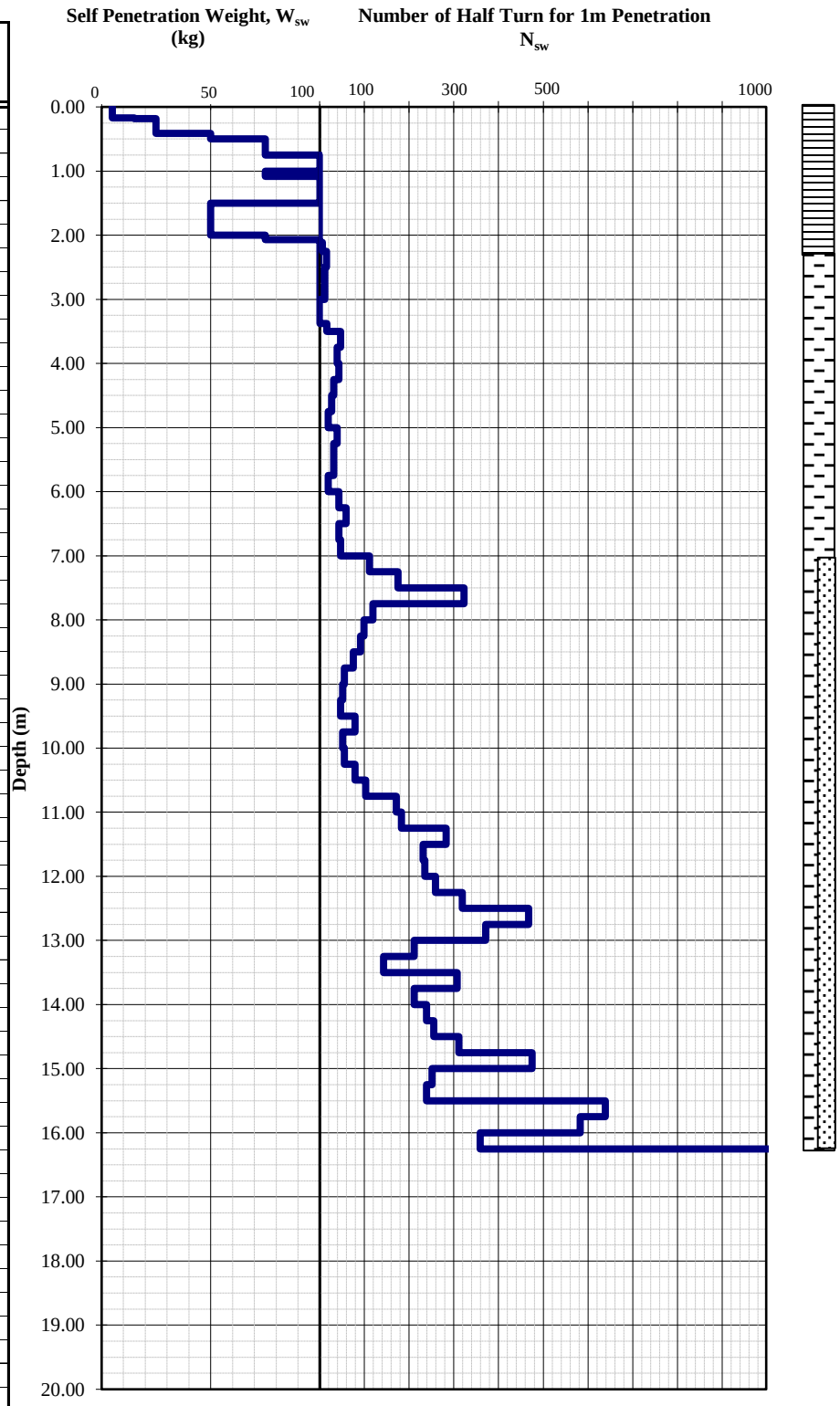


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-12-10
Location : N 2400996.10: E 383067.61
Ground Level : +1.87mMSL

Tested Date : 30-Sep-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.17	5	N.A.	17	N.A.
0.17 - 0.18	15	N.A.	1	N.A.
0.18 - 0.41	25	N.A.	23	N.A.
0.41 - 0.50	50	N.A.	9	N.A.
0.50 - 0.75	75	N.A.	25	N.A.
0.75 - 1.00	100	N.A.	25	N.A.
1.00 - 1.08	75	N.A.	8	N.A.
1.08 - 1.50	100	N.A.	42	N.A.
1.50 - 2.00	50	N.A.	50	N.A.
2.00 - 2.07	75	N.A.	7	N.A.
2.07 - 2.11	100	N.A.	4	N.A.
2.11 - 2.25	100	1	14	7
2.25 - 2.50	100	4	25	16
2.50 - 2.75	100	3	25	12
2.75 - 3.00	100	3	25	12
3.00 - 3.38	100	N.A.	38	N.A.
3.38 - 3.50	100	2	12	17
3.50 - 3.75	100	12	25	48
3.75 - 4.00	100	10	25	40
4.00 - 4.25	100	11	25	44
4.25 - 4.50	100	8	25	32
4.50 - 4.75	100	7	25	28
4.75 - 5.00	100	5	25	20
5.00 - 5.25	100	10	25	40
5.25 - 5.50	100	8	25	32
5.50 - 5.75	100	8	25	32
5.75 - 6.00	100	5	25	20
6.00 - 6.25	100	11	25	44
6.25 - 6.50	100	15	25	60
6.50 - 6.75	100	11	25	44
6.75 - 7.00	100	12	25	48
7.00 - 7.25	100	28	25	112
7.25 - 7.50	100	44	25	176
7.50 - 7.75	100	81	25	324
7.75 - 8.00	100	30	25	120
8.00 - 8.25	100	25	25	100
8.25 - 8.50	100	23	25	92
8.50 - 8.75	100	19	25	76
8.75 - 9.00	100	14	25	56
9.00 - 9.25	100	13	25	52
9.25 - 9.50	100	12	25	48
9.50 - 9.75	100	20	25	80
9.75 - 10.00	100	13	25	52
10.00 - 10.25	100	14	25	56
10.25 - 10.50	100	20	25	80
10.50 - 10.75	100	26	25	104
10.75 - 11.00	100	43	25	172
11.00 - 11.25	100	46	25	184
11.25 - 11.50	100	71	25	284
11.50 - 11.75	100	58	25	232
11.75 - 12.00	100	59	25	236
12.00 - 12.25	100	65	25	260
12.25 - 12.50	100	80	25	320
12.50 - 12.75	100	117	25	468
12.75 - 13.00	100	93	25	372
13.00 - 13.25	100	53	25	212
13.25 - 13.50	100	36	25	144
13.50 - 13.75	100	77	25	308
13.75 - 14.00	100	53	25	212
14.00 - 14.25	100	60	25	240
14.25 - 14.50	100	64	25	256
14.50 - 14.75	100	78	25	312
14.75 - 15.00	100	119	25	476
15.00 - 15.25	100	63	25	252
15.25 - 15.50	100	60	25	240
15.50 - 15.75	100	160	25	640
15.75 - 16.00	100	146	25	584
16.00 - 16.25	100	90	25	360
16.25 - 16.28	100	50	3	1667

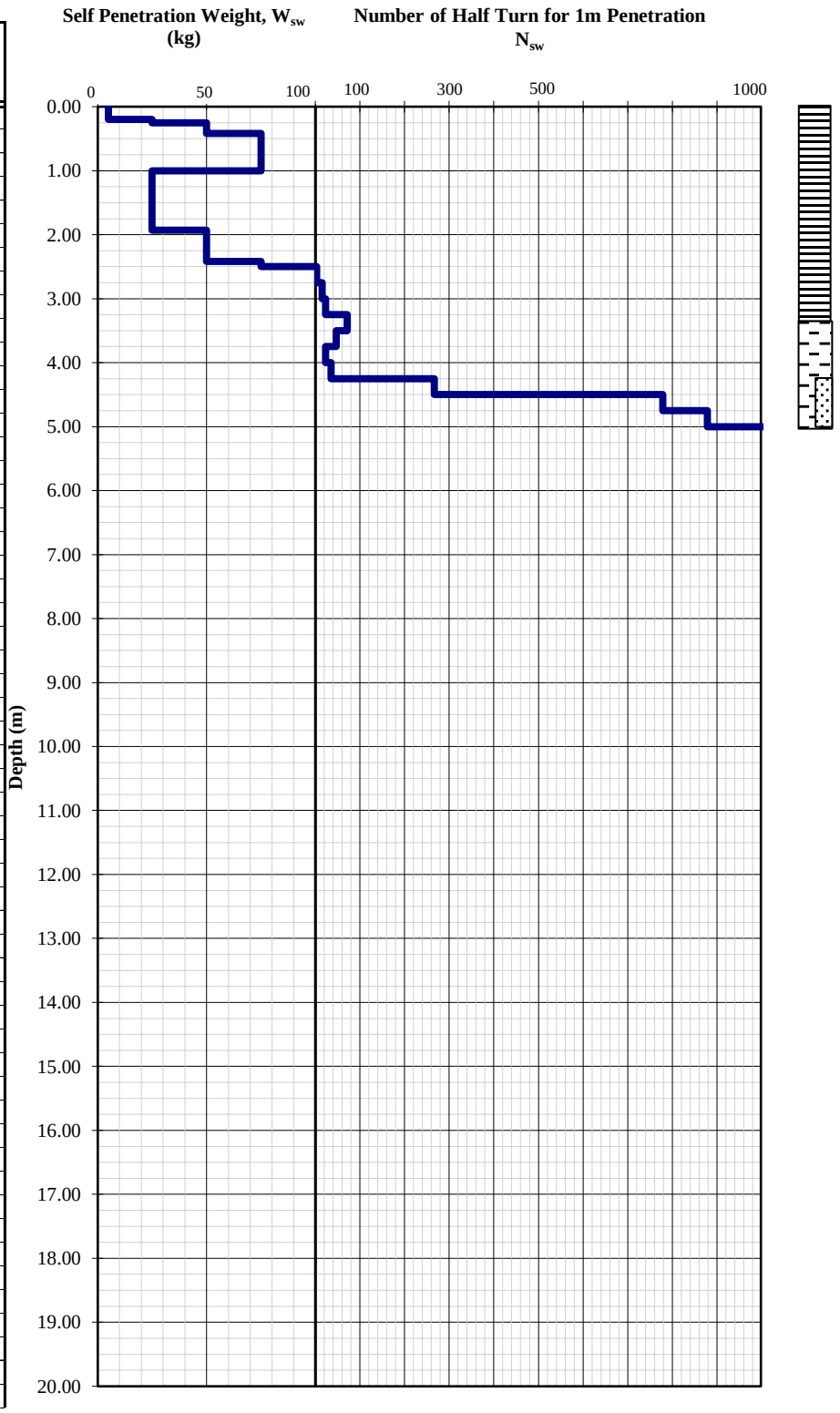


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-12-14
Location : N 2400120.04: E 383069.75
Ground Level : +1.35mMSL

Tested Date : 28-Sep-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.20	5	N.A.	20	N.A.
0.20 - 0.20	15	N.A.	0	N.A.
0.20 - 0.25	25	N.A.	5	N.A.
0.25 - 0.42	50	N.A.	17	N.A.
0.42 - 1.00	75	N.A.	58	N.A.
1.00 - 1.93	25	N.A.	93	N.A.
1.93 - 2.42	50	N.A.	49	N.A.
2.42 - 2.50	75	N.A.	8	N.A.
2.50 - 2.50	100	N.A.	0	N.A.
2.50 - 2.75	100	1	25	4
2.75 - 3.00	100	4	25	16
3.00 - 3.25	100	6	25	24
3.25 - 3.50	100	18	25	72
3.50 - 3.75	100	12	25	48
3.75 - 4.00	100	6	25	24
4.00 - 4.25	100	9	25	36
4.25 - 4.50	100	67	25	268
4.50 - 4.75	100	195	25	780
4.75 - 5.00	100	220	25	880
5.00 - 5.14	100	150	14	1071
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

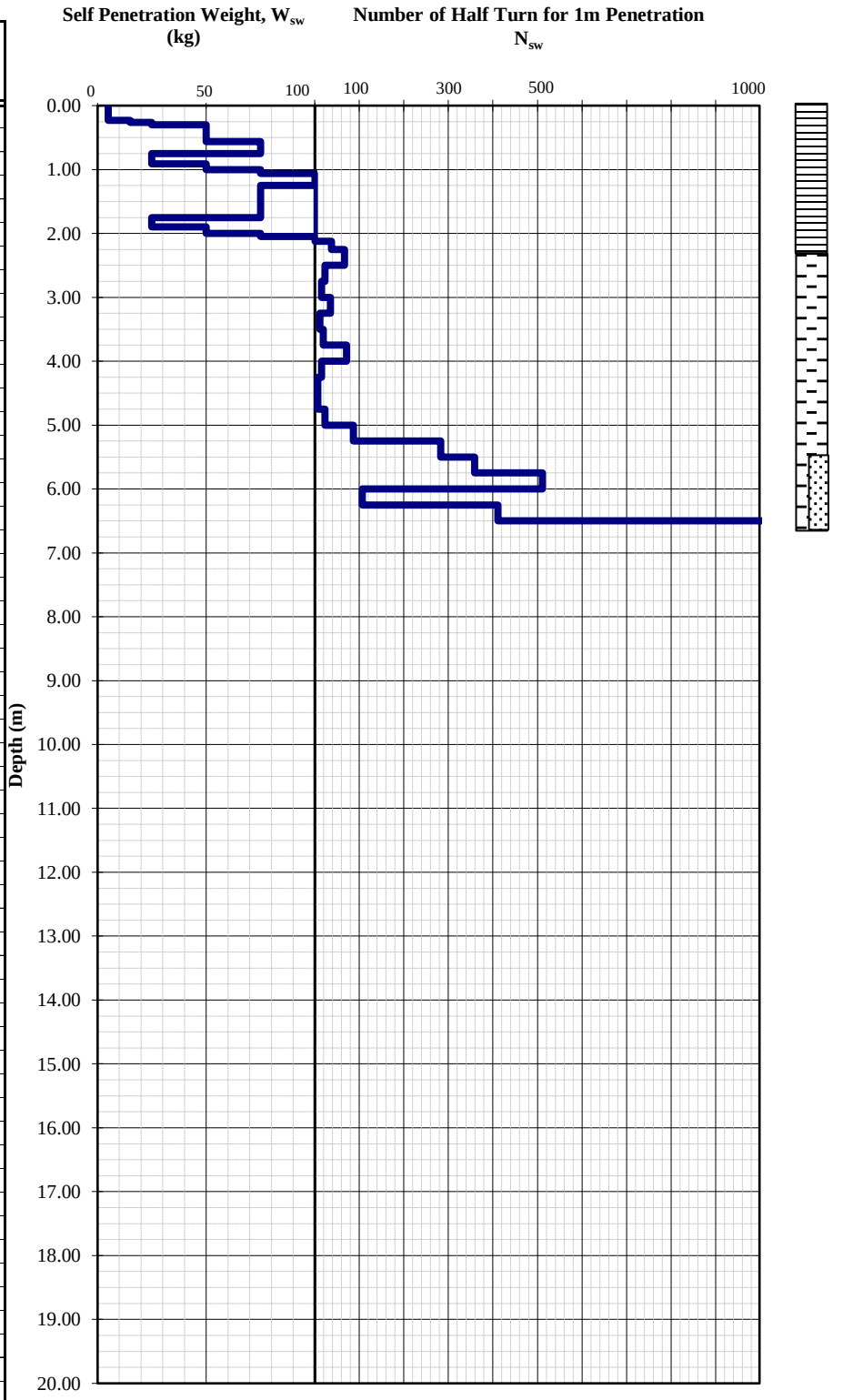


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-12a-11
Location : N 2400718.41: E 383327.49
Ground Level : +1.48mMSL

Tested Date : 29-Sep-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.23	5	N.A.	23	N.A.
0.23 - 0.26	15	N.A.	3	N.A.
0.26 - 0.30	25	N.A.	4	N.A.
0.30 - 0.56	50	N.A.	26	N.A.
0.56 - 0.75	75	N.A.	19	N.A.
0.75 - 0.91	25	N.A.	16	N.A.
0.91 - 1.00	50	N.A.	9	N.A.
1.00 - 1.06	75	N.A.	6	N.A.
1.06 - 1.25	100	N.A.	19	N.A.
1.25 - 1.75	75	N.A.	50	N.A.
1.75 - 1.90	25	N.A.	15	N.A.
1.90 - 2.00	50	N.A.	10	N.A.
2.00 - 2.05	75	N.A.	5	N.A.
2.05 - 2.12	100	N.A.	7	N.A.
2.12 - 2.25	100	5	13	38
2.25 - 2.50	100	17	25	68
2.50 - 2.75	100	6	25	24
2.75 - 3.00	100	4	25	16
3.00 - 3.25	100	9	25	36
3.25 - 3.50	100	3	25	12
3.50 - 3.75	100	5	25	20
3.75 - 4.00	100	18	25	72
4.00 - 4.25	100	4	25	16
4.25 - 4.50	100	2	25	8
4.50 - 4.75	100	2	25	8
4.75 - 5.00	100	6	25	24
5.00 - 5.25	100	22	25	88
5.25 - 5.50	100	71	25	284
5.50 - 5.75	100	90	25	360
5.75 - 6.00	100	128	25	512
6.00 - 6.25	100	27	25	108
6.25 - 6.50	100	103	25	412
6.50 - 6.59	100	100	9	1111
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

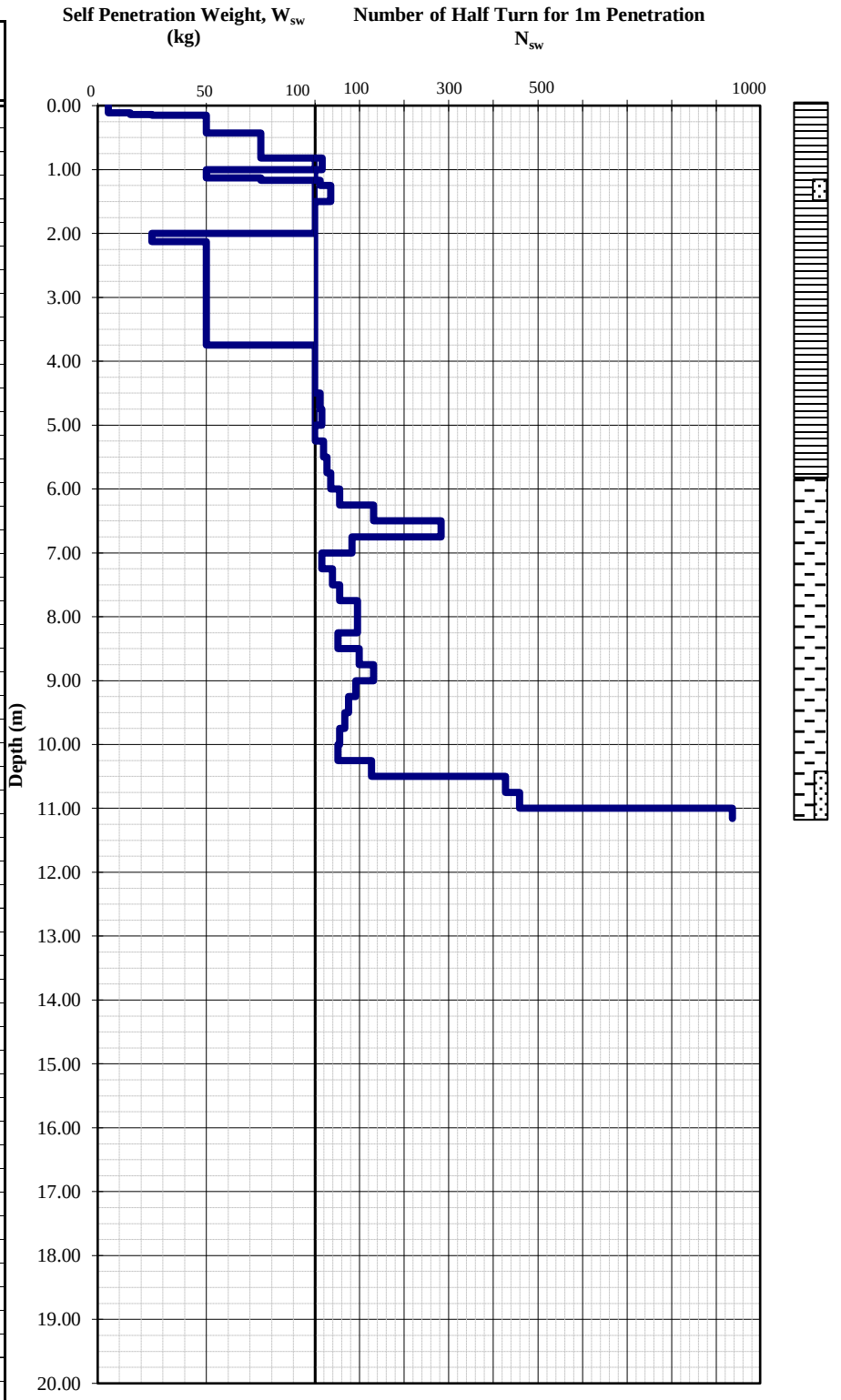


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-12a-12a
Location : N 2400505.14: E 383269.33
Ground Level : +1.54mMSL

Tested Date : 31-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.11	5	N.A.	11	N.A.
0.11 - 0.14	15	N.A.	3	N.A.
0.14 - 0.15	25	N.A.	1	N.A.
0.15 - 0.43	50	N.A.	28	N.A.
0.43 - 0.82	75	N.A.	39	N.A.
0.82 - 0.82	100	N.A.	0	N.A.
0.82 - 1.00	100	3	18	17
1.00 - 1.00	100	N.A.	0	N.A.
1.00 - 1.13	50	N.A.	13	N.A.
1.13 - 1.17	75	N.A.	4	N.A.
1.17 - 1.17	100	N.A.	0	N.A.
1.17 - 1.25	100	1	8	13
1.25 - 1.50	100	9	25	36
1.50 - 2.00	100	N.A.	50	N.A.
2.00 - 2.00	50	N.A.	0	N.A.
2.00 - 2.13	25	N.A.	13	N.A.
2.13 - 2.50	50	N.A.	37	N.A.
2.50 - 3.00	50	N.A.	50	N.A.
3.00 - 3.25	50	N.A.	25	N.A.
3.25 - 3.50	50	N.A.	25	N.A.
3.50 - 3.75	50	N.A.	25	N.A.
3.75 - 4.00	100	N.A.	25	N.A.
4.00 - 4.50	100	N.A.	50	N.A.
4.50 - 4.75	100	3	25	12
4.75 - 5.00	100	4	25	16
5.00 - 5.25	100	N.A.	25	N.A.
5.25 - 5.50	100	5	25	20
5.50 - 5.75	100	7	25	28
5.75 - 6.00	100	9	25	36
6.00 - 6.25	100	14	25	56
6.25 - 6.50	100	33	25	132
6.50 - 6.75	100	71	25	284
6.75 - 7.00	100	21	25	84
7.00 - 7.25	100	4	25	16
7.25 - 7.50	100	10	25	40
7.50 - 7.75	100	14	25	56
7.75 - 8.00	100	24	25	96
8.00 - 8.25	100	24	25	96
8.25 - 8.50	100	13	25	52
8.50 - 8.75	100	25	25	100
8.75 - 9.00	100	33	25	132
9.00 - 9.25	100	23	25	92
9.25 - 9.50	100	19	25	76
9.50 - 9.75	100	17	25	68
9.75 - 10.00	100	14	25	56
10.00 - 10.25	100	13	25	52
10.25 - 10.50	100	32	25	128
10.50 - 10.75	100	107	25	428
10.75 - 11.00	100	115	25	460
11.00 - 11.16	100	150	16	937
-				
-				
-				
-				
-				
-				

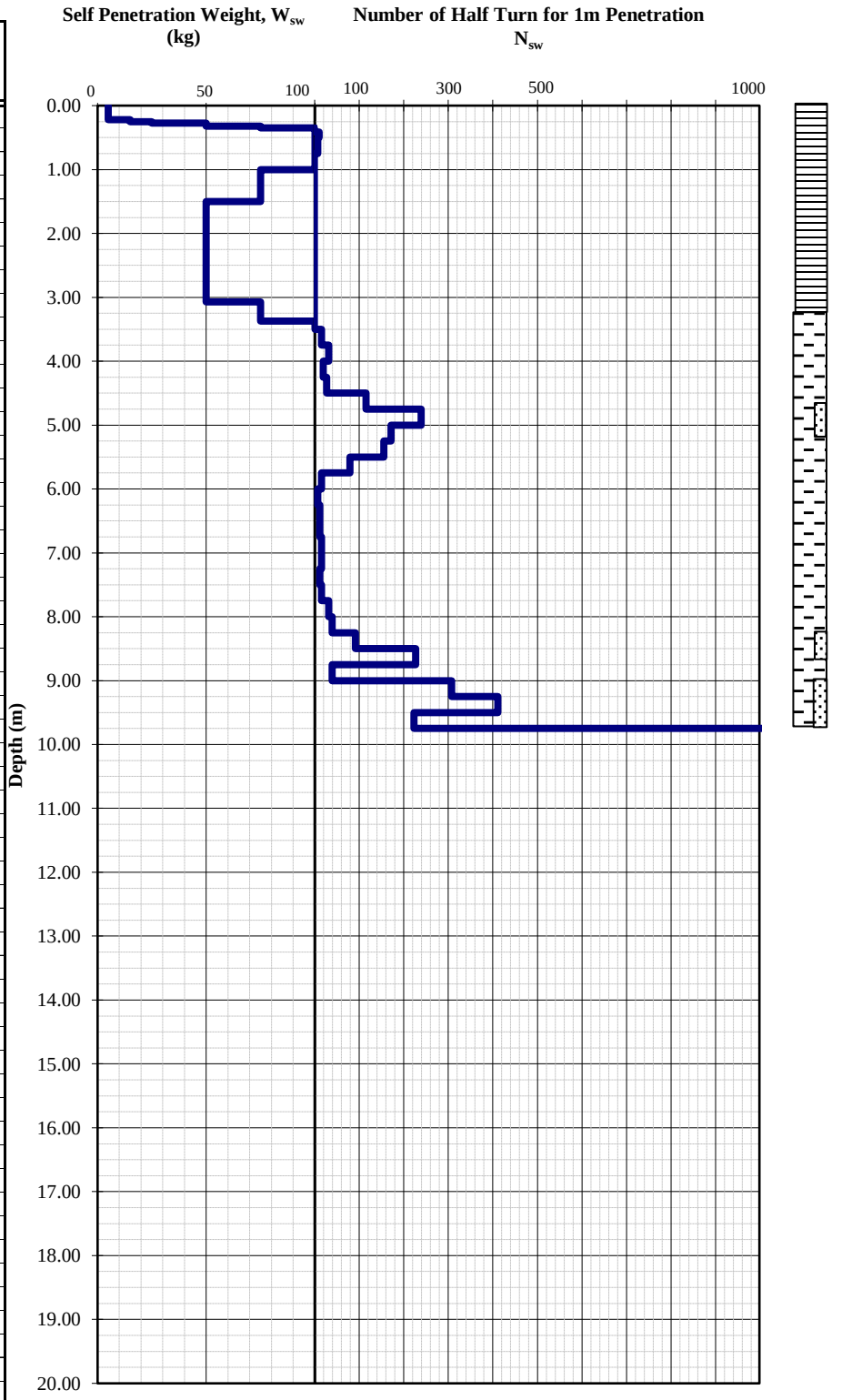


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-12a-15a
Location : N 2399866.59: E 383269.28
Ground Level : +1.26mMSL

Tested Date : 24-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.22	5	N.A.	22	N.A.
0.22 - 0.25	15	N.A.	3	N.A.
0.25 - 0.27	25	N.A.	2	N.A.
0.27 - 0.32	50	N.A.	5	N.A.
0.32 - 0.35	75	N.A.	3	N.A.
0.35 - 0.41	100	N.A.	6	N.A.
0.41 - 0.50	100	1	9	11
0.50 - 0.75	100	2	25	8
0.75 - 1.00	100	N.A.	25	N.A.
1.00 - 1.50	75	N.A.	50	N.A.
1.50 - 3.07	50	N.A.	157	N.A.
3.07 - 3.37	75	N.A.	30	N.A.
3.37 - 3.50	100	N.A.	13	N.A.
3.50 - 3.75	100	4	25	16
3.75 - 4.00	100	8	25	32
4.00 - 4.25	100	5	25	20
4.25 - 4.50	100	7	25	28
4.50 - 4.75	100	29	25	116
4.75 - 5.00	100	60	25	240
5.00 - 5.25	100	43	25	172
5.25 - 5.50	100	39	25	156
5.50 - 5.75	100	20	25	80
5.75 - 6.00	100	4	25	16
6.00 - 6.25	100	2	25	8
6.25 - 6.50	100	3	25	12
6.50 - 6.75	100	3	25	12
6.75 - 7.00	100	4	25	16
7.00 - 7.25	100	4	25	16
7.25 - 7.50	100	3	25	12
7.50 - 7.75	100	4	25	16
7.75 - 8.00	100	8	25	32
8.00 - 8.25	100	10	25	40
8.25 - 8.50	100	23	25	92
8.50 - 8.75	100	57	25	228
8.75 - 9.00	100	10	25	40
9.00 - 9.25	100	77	25	308
9.25 - 9.50	100	103	25	412
9.50 - 9.75	100	56	25	224
9.75 - 9.88	100	150	13	1154
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

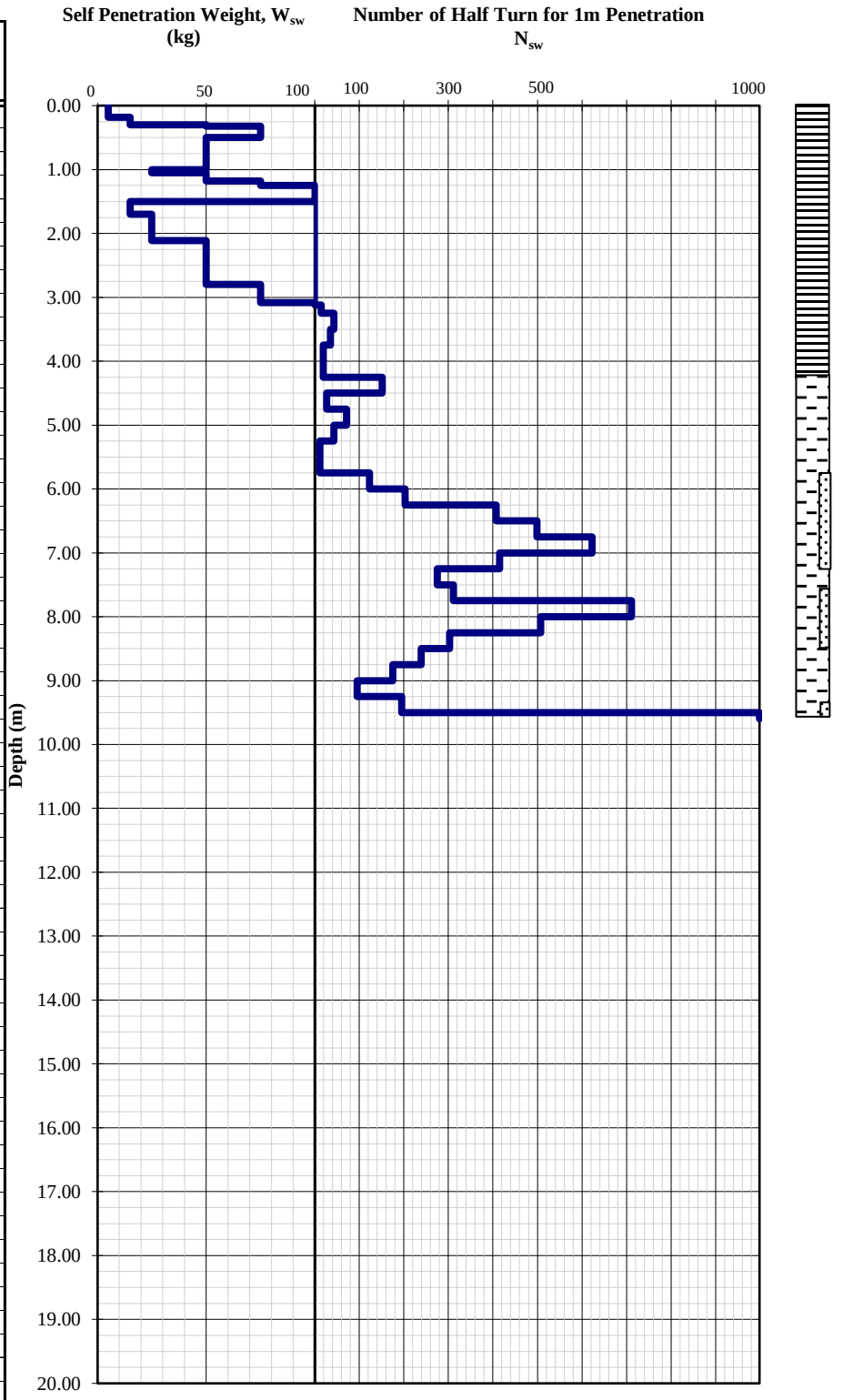


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-13-13
Location : N 2400356.68: E383475.69
Ground Level : +1.67mMSL

Tested Date : 27-Sep-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.18	5	N.A.	18	N.A.
0.18 - 0.30	15	N.A.	12	N.A.
0.30 - 0.30	25	N.A.	0	N.A.
0.30 - 0.32	50	N.A.	2	N.A.
0.32 - 0.50	75	N.A.	18	N.A.
0.50 - 1.00	50	N.A.	50	N.A.
1.00 - 1.05	25	N.A.	5	N.A.
1.05 - 1.18	50	N.A.	13	N.A.
1.18 - 1.25	75	N.A.	7	N.A.
1.25 - 1.50	100	N.A.	25	N.A.
1.50 - 1.70	15	N.A.	20	N.A.
1.70 - 2.11	25	N.A.	41	N.A.
2.11 - 2.80	50	N.A.	69	N.A.
2.80 - 3.08	75	N.A.	28	N.A.
3.08 - 3.12	100	N.A.	4	N.A.
3.12 - 3.25	100	2	13	15
3.25 - 3.50	100	11	25	44
3.50 - 3.75	100	9	25	36
3.75 - 4.00	100	5	25	20
4.00 - 4.25	100	5	25	20
4.25 - 4.50	100	38	25	152
4.50 - 4.75	100	7	25	28
4.75 - 5.00	100	18	25	72
5.00 - 5.25	100	11	25	44
5.25 - 5.50	100	3	25	12
5.50 - 5.75	100	3	25	12
5.75 - 6.00	100	31	25	124
6.00 - 6.25	100	51	25	204
6.25 - 6.50	100	102	25	408
6.50 - 6.75	100	125	25	500
6.75 - 7.00	100	156	25	624
7.00 - 7.25	100	104	25	416
7.25 - 7.50	100	69	25	276
7.50 - 7.75	100	78	25	312
7.75 - 8.00	100	178	25	712
8.00 - 8.25	100	127	25	508
8.25 - 8.50	100	76	25	304
8.50 - 8.75	100	60	25	240
8.75 - 9.00	100	44	25	176
9.00 - 9.25	100	24	25	96
9.25 - 9.50	100	49	25	196
9.50 - 9.60	100	100	10	1000
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

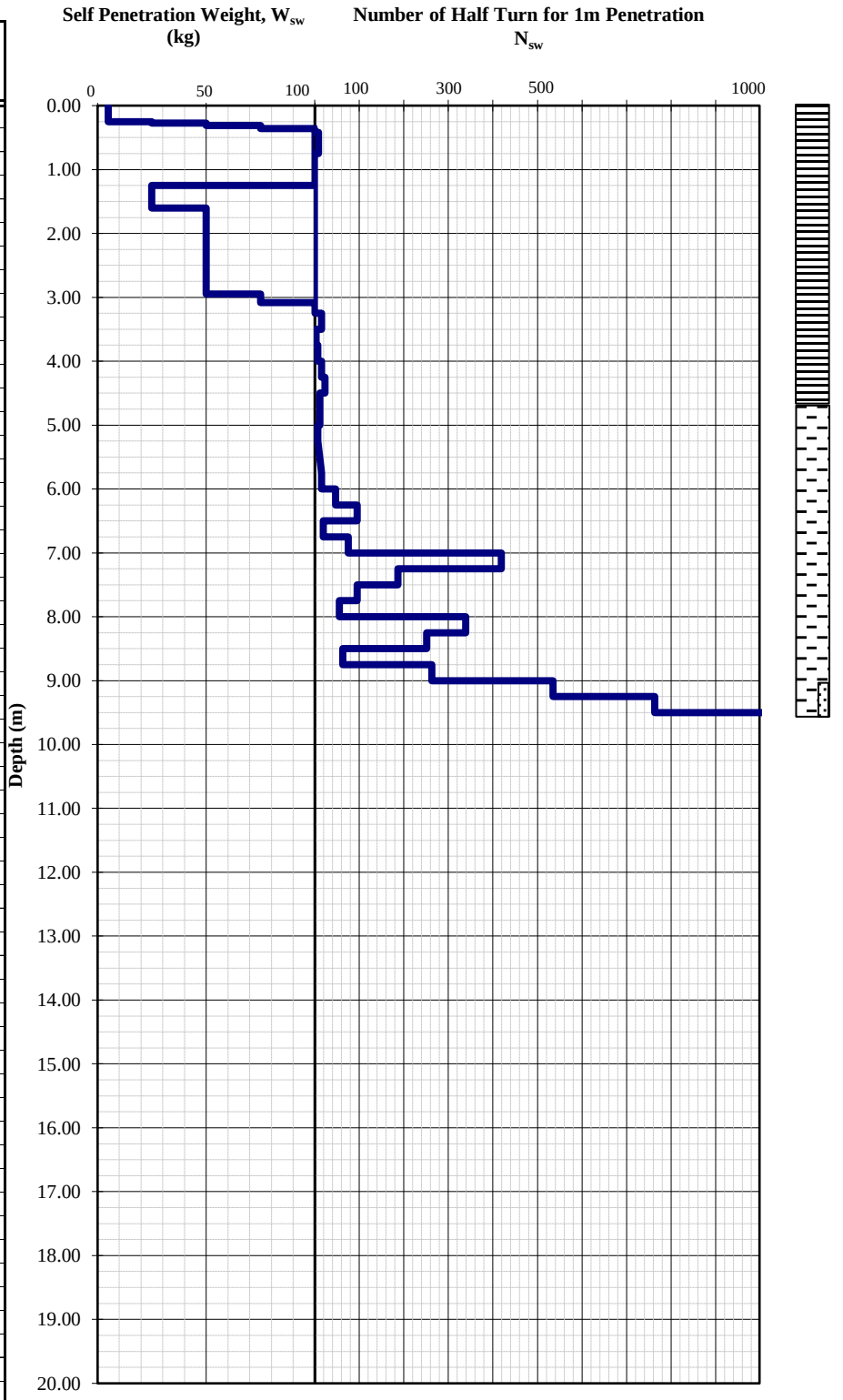


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-13-15
Location : N : 2399919.28 E 383469.07
Ground Level : +1.35mMSL

Tested Date : 2014/9/25-9/26
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.25	5	N.A.	25	N.A.
0.25 - 0.25	15	N.A.	0	N.A.
0.25 - 0.27	25	N.A.	2	N.A.
0.27 - 0.31	50	N.A.	4	N.A.
0.31 - 0.36	75	N.A.	5	N.A.
0.36 - 0.42	100	N.A.	6	N.A.
0.42 - 0.75	100	3	33	9
0.75 - 1.25	100	N.A.	50	N.A.
1.25 - 1.60	25	N.A.	35	N.A.
1.60 - 2.95	50	N.A.	135	N.A.
2.95 - 3.08	75	N.A.	13	N.A.
3.08 - 3.25	100	N.A.	17	N.A.
3.25 - 3.50	100	4	25	16
3.50 - 3.75	100	1	25	4
3.75 - 4.00	100	2	25	8
4.00 - 4.25	100	4	25	16
4.25 - 4.50	100	6	25	24
4.50 - 4.75	100	3	25	12
4.75 - 5.00	100	3	25	12
5.00 - 5.25	100	2	25	8
5.25 - 5.75	100		50	
5.75 - 6.00	100	4	25	16
6.00 - 6.25	100	12	25	48
6.25 - 6.50	100	24	25	96
6.50 - 6.75	100	5	25	20
6.75 - 7.00	100	19	25	76
7.00 - 7.25	100	105	25	420
7.25 - 7.50	100	47	25	188
7.50 - 7.75	100	24	25	96
7.75 - 8.00	100	14	25	56
8.00 - 8.25	100	85	25	340
8.25 - 8.50	100	63	25	252
8.50 - 8.75	100	16	25	64
8.75 - 9.00	100	66	25	264
9.00 - 9.25	100	134	25	536
9.25 - 9.50	100	191	25	764
9.50 - 9.53	100	50	3	1667
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

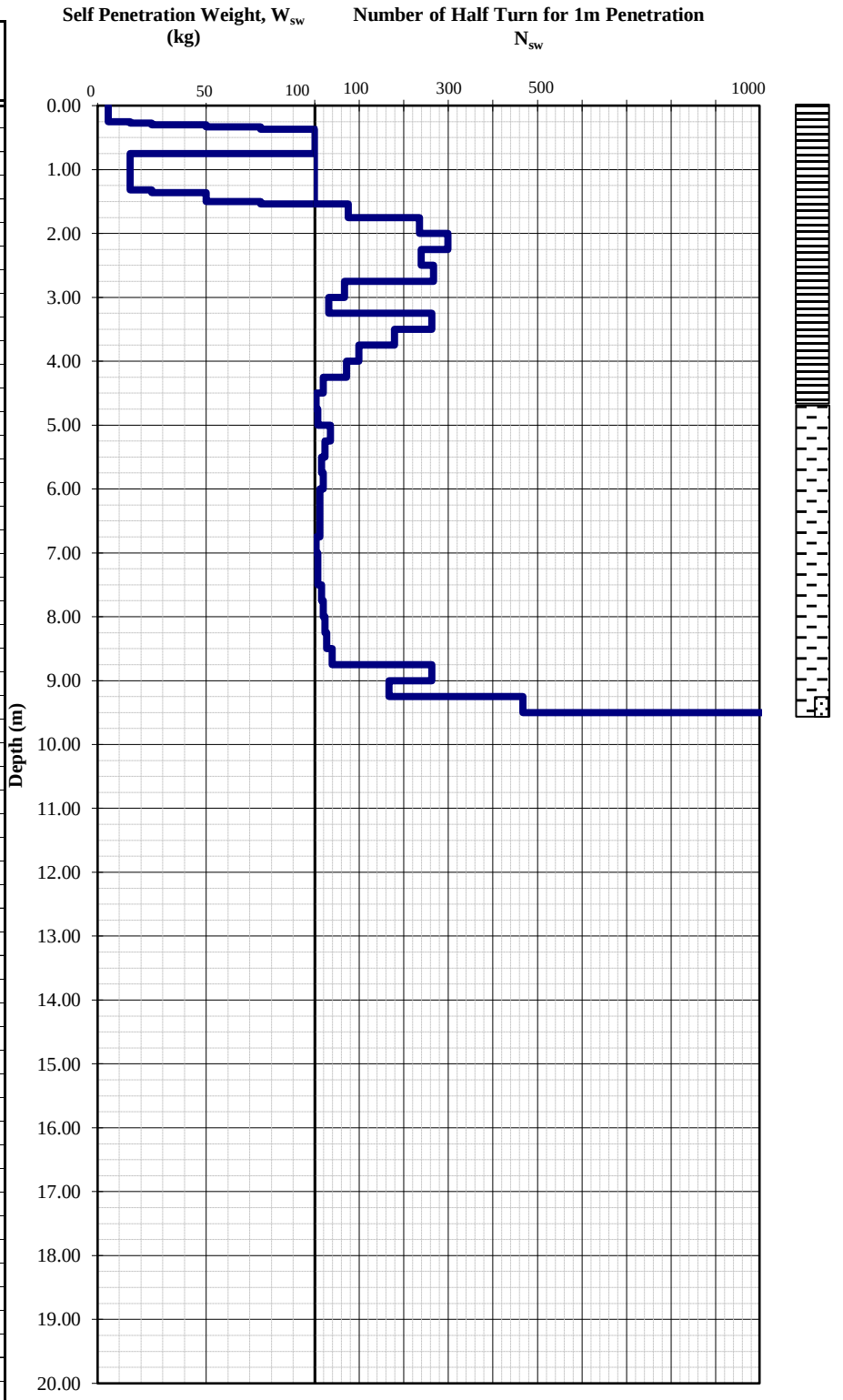


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-13-16
Location : N : 2399803.75 E 383469.25
Ground Level : +1.56mMSL

Tested Date : 26-Sep-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.25	5	N.A.	25	N.A.
0.25 - 0.27	15	N.A.	2	N.A.
0.27 - 0.30	25	N.A.	3	N.A.
0.30 - 0.33	50	N.A.	3	N.A.
0.33 - 0.37	75	N.A.	4	N.A.
0.37 - 0.42	100	N.A.	5	N.A.
0.42 - 0.75	100	N.A.	33	N.A.
0.75 - 1.32	15	N.A.	57	N.A.
1.32 - 1.36	25	N.A.	4	N.A.
1.36 - 1.50	50	N.A.	14	N.A.
1.50 - 1.54	75	N.A.	4	N.A.
1.54 - 1.54	100	N.A.	0	N.A.
1.54 - 1.75	100	16	21	76
1.75 - 2.00	100	59	25	236
2.00 - 2.25	100	75	25	300
2.25 - 2.50	100	60	25	240
2.50 - 2.75	100	67	25	268
2.75 - 3.00	100	17	25	68
3.00 - 3.25	100	8	25	32
3.25 - 3.50	100	66	25	264
3.50 - 3.75	100	45	25	180
3.75 - 4.00	100	25	25	100
4.00 - 4.25	100	18	25	72
4.25 - 4.50	100	5	25	20
4.50 - 4.75	100	1	25	4
4.75 - 5.00	100	2	25	8
5.00 - 5.25	100	9	25	36
5.25 - 5.50	100	6	25	24
5.50 - 5.75	100	4	25	16
5.75 - 6.00	100	5	25	20
6.00 - 6.25	100	3	25	12
6.25 - 6.50	100	3	25	12
6.50 - 6.75	100	3	25	12
6.75 - 7.00	100	1	25	4
7.00 - 7.25	100	2	25	8
7.25 - 7.50	100	2	25	8
7.50 - 7.75	100	4	25	16
7.75 - 8.00	100	5	25	20
8.00 - 8.25	100	6	25	24
8.25 - 8.50	100	7	25	28
8.50 - 8.75	100	10	25	40
8.75 - 9.00	100	66	25	264
9.00 - 9.25	100	42	25	168
9.25 - 9.50	100	117	25	468
9.50 - 9.59	100	100	9	1111
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

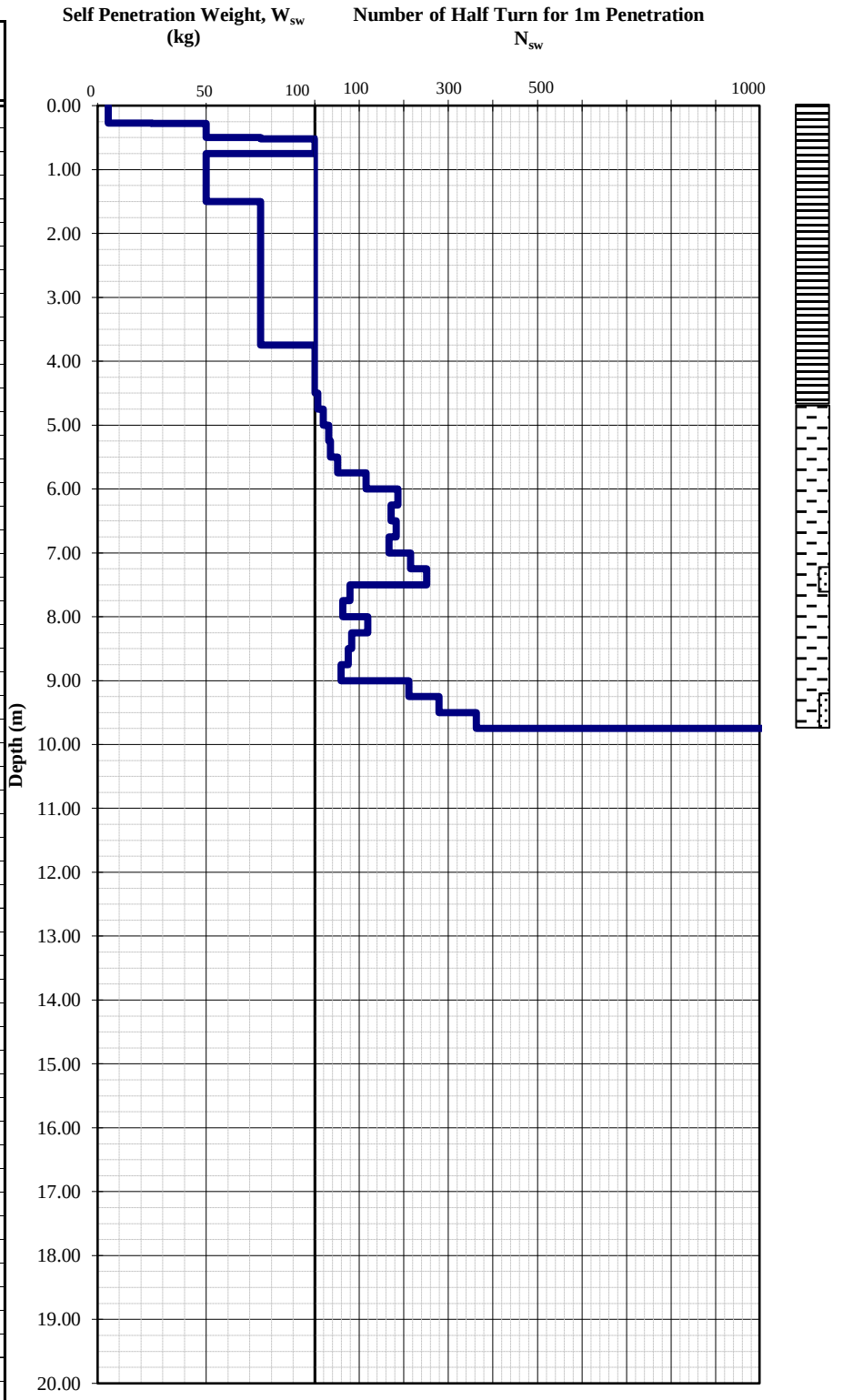


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-14-12
Location : N : 2400522.67 E : 383758.03
Ground Level : +1.37mMSL

Tested Date : 25-Sep-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.27	5		27	
0.27 - 0.27	15		0	
0.27 - 0.28	25		1	
0.28 - 0.50	50	N.A.	22	N.A.
0.50 - 0.52	75	N.A.	2	N.A.
0.52 - 0.57	100	N.A.	5	N.A.
0.57 - 0.75	100	N.A.	18	N.A.
0.75 - 1.50	50	N.A.	75	N.A.
1.50 - 3.75	75	N.A.	225	N.A.
3.75 - 4.50	100	N.A.	75	N.A.
4.50 - 4.75	100	2	25	8
4.75 - 5.00	100	5	25	20
5.00 - 5.25	100	8	25	32
5.25 - 5.50	100	9	25	36
5.50 - 5.75	100	13	25	52
5.75 - 6.00	100	29	25	116
6.00 - 6.25	100	47	25	188
6.25 - 6.50	100	43	25	172
6.50 - 6.75	100	46	25	184
6.75 - 7.00	100	42	25	168
7.00 - 7.25	100	54	25	216
7.25 - 7.50	100	63	25	252
7.50 - 7.75	100	20	25	80
7.75 - 8.00	100	16	25	64
8.00 - 8.25	100	30	25	120
8.25 - 8.50	100	21	25	84
8.50 - 8.75	100	19	25	76
8.75 - 9.00	100	15	25	60
9.00 - 9.25	100	53	25	212
9.25 - 9.50	100	70	25	280
9.50 - 9.75	100	91	25	364
9.75 - 9.82	100	100	7	1429
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

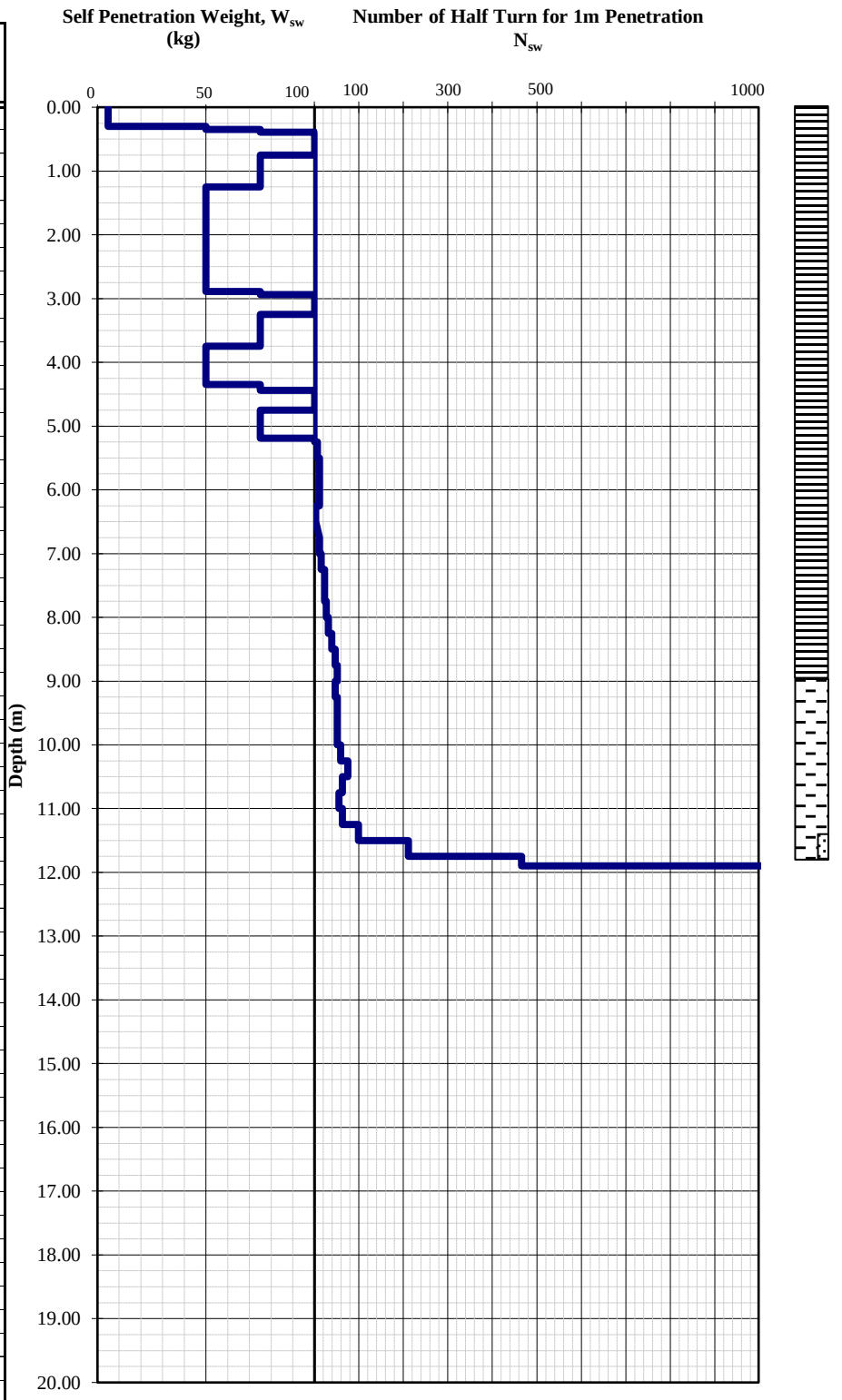


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-14-14
Location : N : 2400120.10 E : 383758.15
Ground Level : +1.11mMSL

Tested Date : 22-Sep-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.30	5	N.A.	30	N.A.
0.30 - 0.30	15	N.A.	0	N.A.
0.30 - 0.30	25	N.A.	0	N.A.
0.30 - 0.35	50	N.A.	5	N.A.
0.35 - 0.39	75	N.A.	4	N.A.
0.39 - 0.75	100	N.A.	36	N.A.
0.75 - 1.25	75	N.A.	50	N.A.
1.25 - 2.89	50	N.A.	164	N.A.
2.89 - 2.94	75	N.A.	5	N.A.
2.94 - 3.25	100	N.A.	31	N.A.
3.25 - 3.75	75	N.A.	50	N.A.
3.75 - 4.35	50	N.A.	60	N.A.
4.35 - 4.44	75	N.A.	9	N.A.
4.44 - 4.75	100	N.A.	31	N.A.
4.75 - 5.19	75	N.A.	44	N.A.
5.19 - 5.25	100	N.A.	6	N.A.
5.25 - 5.50	100	2	25	8
5.50 - 5.75	100	3	25	12
5.75 - 6.00	100	3	25	12
6.00 - 6.25	100	3	25	12
6.25 - 6.50	100	1	25	4
6.50 - 6.75	100		25	
6.75 - 7.00	100	3	25	12
7.00 - 7.25	100	4	25	16
7.25 - 7.50	100	6	25	24
7.50 - 7.75	100	6	25	24
7.75 - 8.00	100	7	25	28
8.00 - 8.25	100	8	25	32
8.25 - 8.50	100	10	25	40
8.50 - 8.75	100	12	25	48
8.75 - 9.00	100	13	25	52
9.00 - 9.25	100	12	25	48
9.25 - 9.50	100	13	25	52
9.50 - 9.75	100	13	25	52
9.75 - 10.00	100	13	25	52
10.00 - 10.25	100	15	25	60
10.25 - 10.50	100	19	25	76
10.50 - 10.75	100	16	25	64
10.75 - 11.00	100	14	25	56
11.00 - 11.25	100	16	25	64
11.25 - 11.50	100	25	25	100
11.50 - 11.75	100	53	25	212
11.75 - 11.90	100	70	15	467
11.90 - 11.93	100	50	3	1667
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

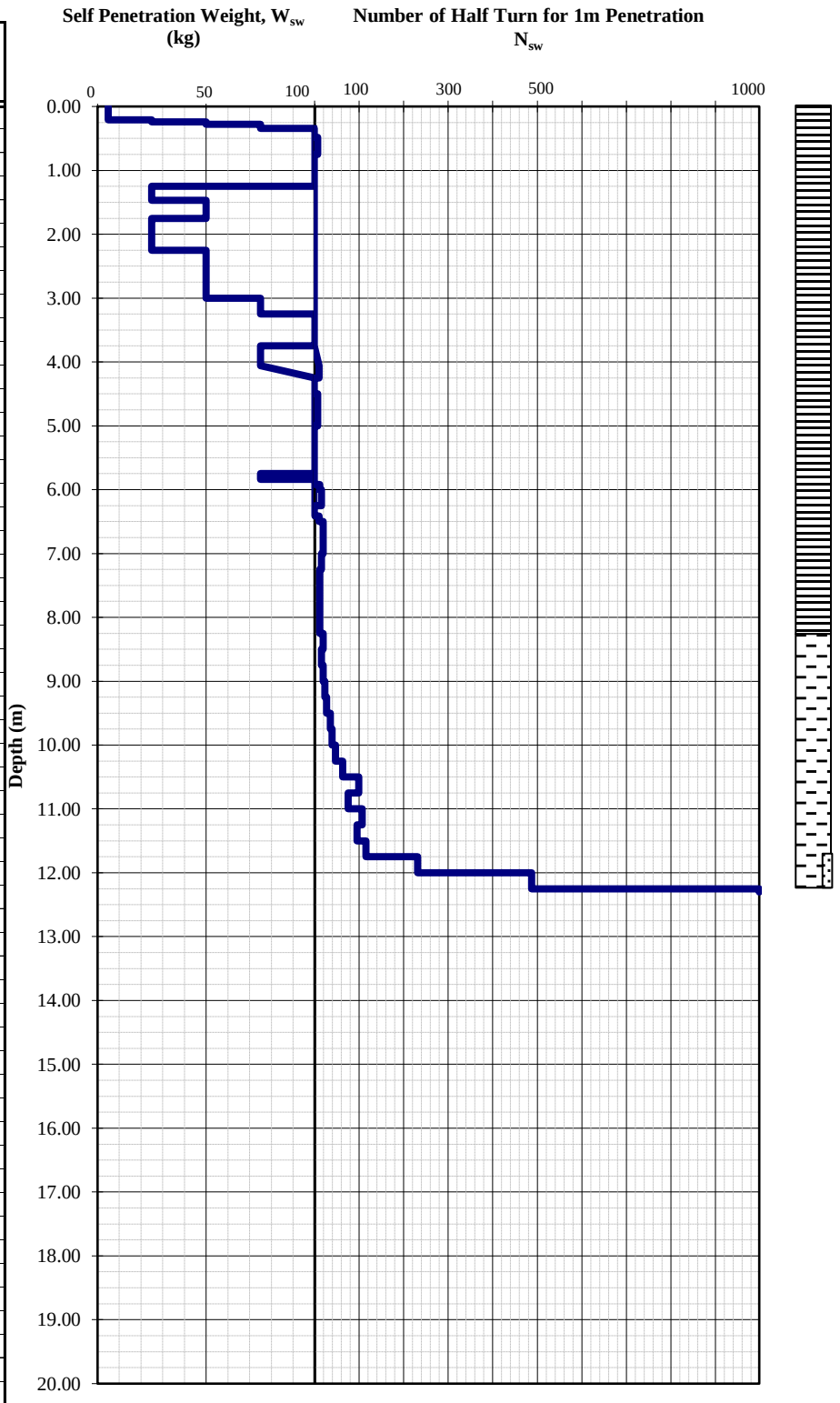


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-14-15
Location : N : 2399922.10 E : 383742.37
Ground Level : +1.19mMSL

Tested Date : 25-Sep-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.21	5	N.A.	21	N.A.
0.21 - 0.21	15	N.A.	0	N.A.
0.21 - 0.24	25	N.A.	3	N.A.
0.24 - 0.28	50	N.A.	4	N.A.
0.28 - 0.34	75	N.A.	6	N.A.
0.34 - 0.48	100	N.A.	14	N.A.
0.48 - 0.75	100	2	27	7
0.75 - 1.25	100	N.A.	50	N.A.
1.25 - 1.47	25	N.A.	22	N.A.
1.47 - 1.75	50	N.A.	28	N.A.
1.75 - 2.25	25	N.A.	50	N.A.
2.25 - 3.00	50	N.A.	75	N.A.
3.00 - 3.25	75	N.A.	25	N.A.
3.25 - 3.75	100	N.A.	50	N.A.
3.75 - 4.06	75	N.A.	31	N.A.
4.06 - 4.25	100	2	19	11
4.25 - 4.50	100	N.A.	25	N.A.
4.50 - 4.75	100	2	25	8
4.75 - 5.00	100	2	25	8
5.00 - 5.75	100	N.A.	75	N.A.
5.75 - 5.84	75	N.A.	9	N.A.
5.84 - 5.92	100	N.A.	8	N.A.
5.92 - 6.00	100	1	8	13
6.00 - 6.25	100	4	25	16
6.25 - 6.41	100	N.A.	16	N.A.
6.41 - 6.50	100	1	9	11
6.50 - 6.75	100	5	25	20
6.75 - 7.00	100	5	25	20
7.00 - 7.25	100	4	25	16
7.25 - 7.50	100	3	25	12
7.50 - 7.75	100	3	25	12
7.75 - 8.00	100	3	25	12
8.00 - 8.25	100	3	25	12
8.25 - 8.50	100	5	25	20
8.50 - 8.75	100	4	25	16
8.75 - 9.00	100	5	25	20
9.00 - 9.25	100	6	25	24
9.25 - 9.50	100	7	25	28
9.50 - 9.75	100	9	25	36
9.75 - 10.00	100	10	25	40
10.00 - 10.25	100	12	25	48
10.25 - 10.50	100	16	25	64
10.50 - 10.75	100	25	25	100
10.75 - 11.00	100	19	25	76
11.00 - 11.25	100	27	25	108
11.25 - 11.50	100	24	25	96
11.50 - 11.75	100	29	25	116
11.75 - 12.00	100	58	25	232
12.00 - 12.25	100	122	25	488
12.25 - 12.30	100	50	5	1000
-				
-				
-				
-				
-				
-				
-				

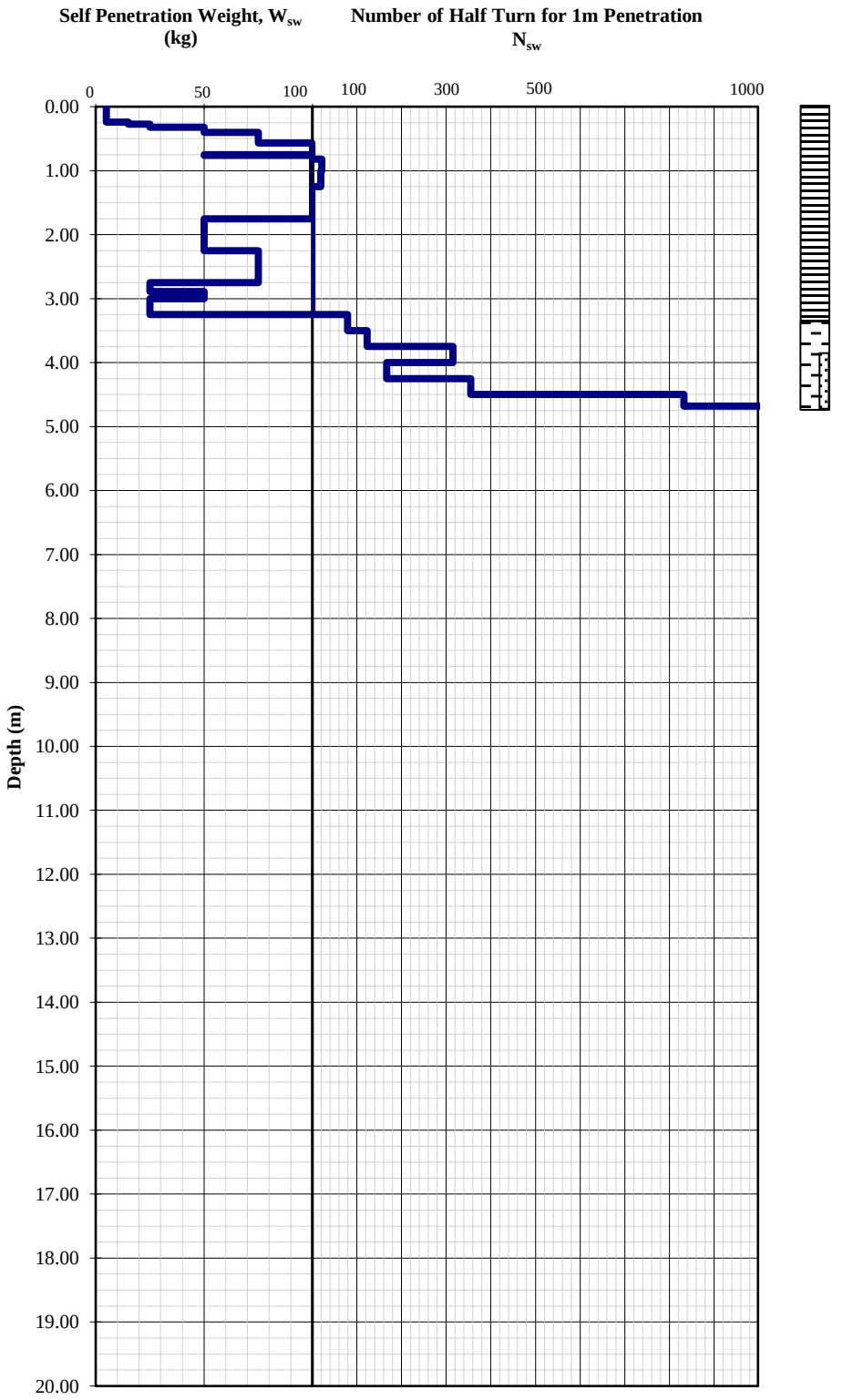


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-16-11
Location : N : 2400724.61 E :384023.23
Ground Level : +1.20mMSL

Tested Date : 8-Oct-14
Performed by : Tomohiro Sadamoto
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.24	5	N.A.	24	N.A.
0.24 - 0.27	15	N.A.	3	N.A.
0.27 - 0.32	25	N.A.	5	N.A.
0.32 - 0.40	50	N.A.	8	N.A.
0.40 - 0.57	75	N.A.	17	N.A.
0.57 - 0.75	100	N.A.	18	N.A.
0.75 - 0.76	50	N.A.	1	N.A.
0.76 - 0.82	100	N.A.	6	N.A.
0.82 - 1.00	100	4	18	22
1.00 - 1.25	100	5	25	20
1.25 - 1.75	100	N.A.	50	N.A.
1.75 - 2.25	50	N.A.	50	N.A.
2.25 - 2.75	75	N.A.	50	N.A.
2.75 - 2.89	25	N.A.	14	N.A.
2.89 - 3.00	50	N.A.	11	N.A.
3.00 - 3.25	25	N.A.	25	N.A.
3.25 - 3.25	100	N.A.	0	N.A.
3.25 - 3.50	100	20	25	80
3.50 - 3.75	100	31	25	124
3.75 - 4.00	100	79	25	316
4.00 - 4.25	100	42	25	168
4.25 - 4.50	100	89	25	356
4.50 - 4.68	100	150	18	833
4.68 - 4.72	100	50	4	1250
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

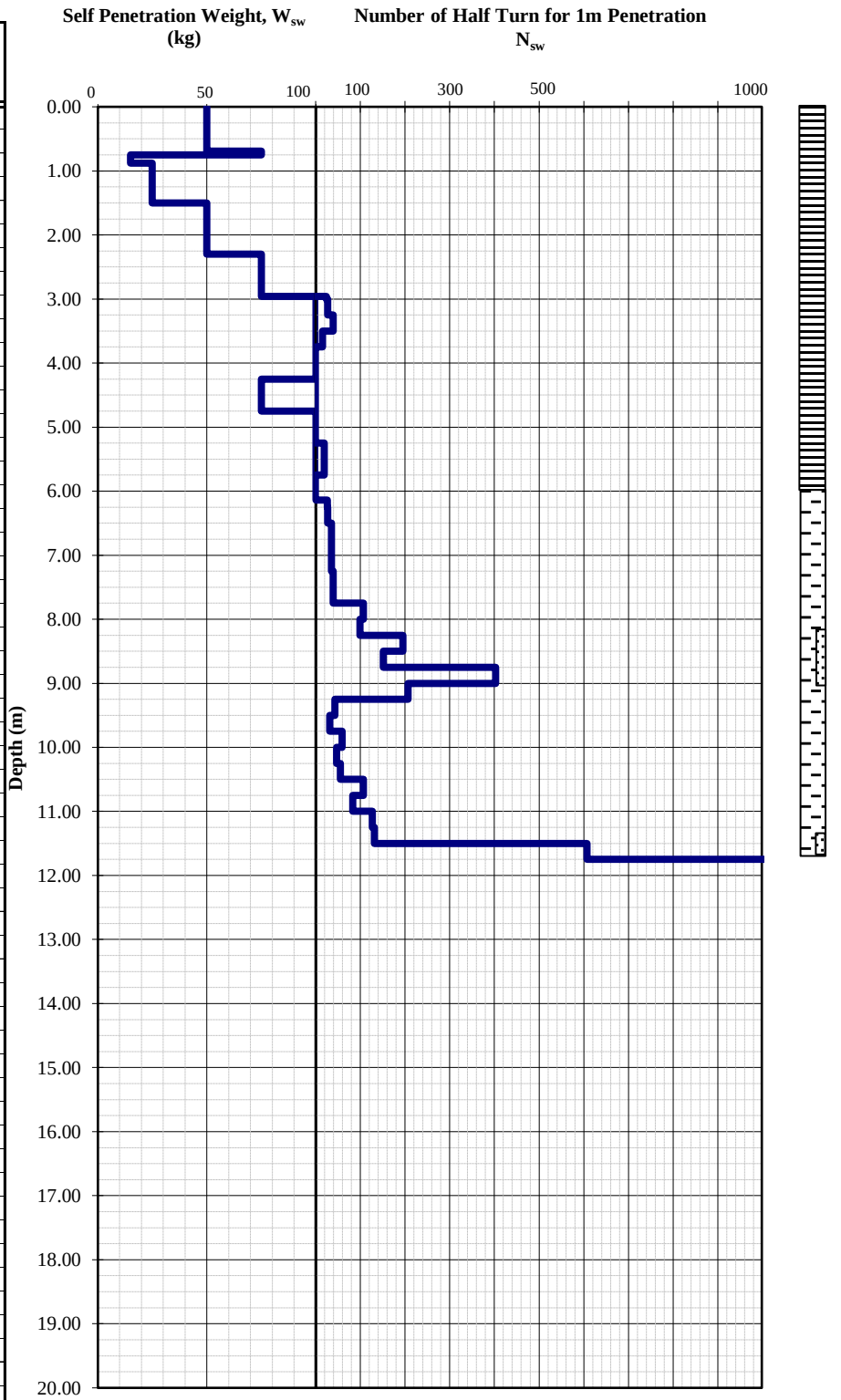


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-16-12
Location : N : 2400526.71 E :384024.99
Ground Level : +1.11mMSL

Tested Date : 7-Oct-14
Performed by : Tomohiro Sadamoto
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.69	50	N.A.	69	N.A.
0.69 - 0.75	75	N.A.	6	N.A.
0.75 - 0.88	15	N.A.	13	N.A.
0.88 - 1.25	25	N.A.	37	N.A.
1.25 - 1.50	25	N.A.	25	N.A.
1.50 - 1.75	50	N.A.	25	N.A.
1.75 - 2.25	50	N.A.	50	N.A.
2.25 - 2.30	50	N.A.	5	N.A.
2.30 - 2.75	75	N.A.	45	N.A.
2.75 - 2.88	75	N.A.	13	N.A.
2.88 - 2.96	75	N.A.	8	N.A.
2.96 - 2.96	100	N.A.	0	N.A.
2.96 - 3.00	100	1	4	25
3.00 - 3.25	100	7	25	28
3.25 - 3.50	100	10	25	40
3.50 - 3.75	100	4	25	16
3.75 - 4.25	100	N.A.	50	N.A.
4.25 - 4.75	75	N.A.	50	N.A.
4.75 - 5.25	100	N.A.	50	N.A.
5.25 - 5.50	100	5	25	20
5.50 - 5.75	100	5	25	20
5.75 - 6.14	100	N.A.	39	N.A.
6.14 - 6.25	100	3	11	27
6.25 - 6.50	100	7	25	28
6.50 - 6.75	100	9	25	36
6.75 - 7.00	100	9	25	36
7.00 - 7.25	100	9	25	36
7.25 - 7.50	100	10	25	40
7.50 - 7.75	100	10	25	40
7.75 - 8.00	100	27	25	108
8.00 - 8.25	100	25	25	100
8.25 - 8.50	100	49	25	196
8.50 - 8.75	100	38	25	152
8.75 - 9.00	100	101	25	404
9.00 - 9.25	100	52	25	208
9.25 - 9.50	100	11	25	44
9.50 - 9.75	100	8	25	32
9.75 - 10.00	100	15	25	60
10.00 - 10.25	100	12	25	48
10.25 - 10.50	100	14	25	56
10.50 - 10.75	100	27	25	108
10.75 - 11.00	100	21	25	84
11.00 - 11.25	100	32	25	128
11.25 - 11.50	100	33	25	132
11.50 - 11.75	100	152	25	608
11.75 - 11.79	100	50	4	1250
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

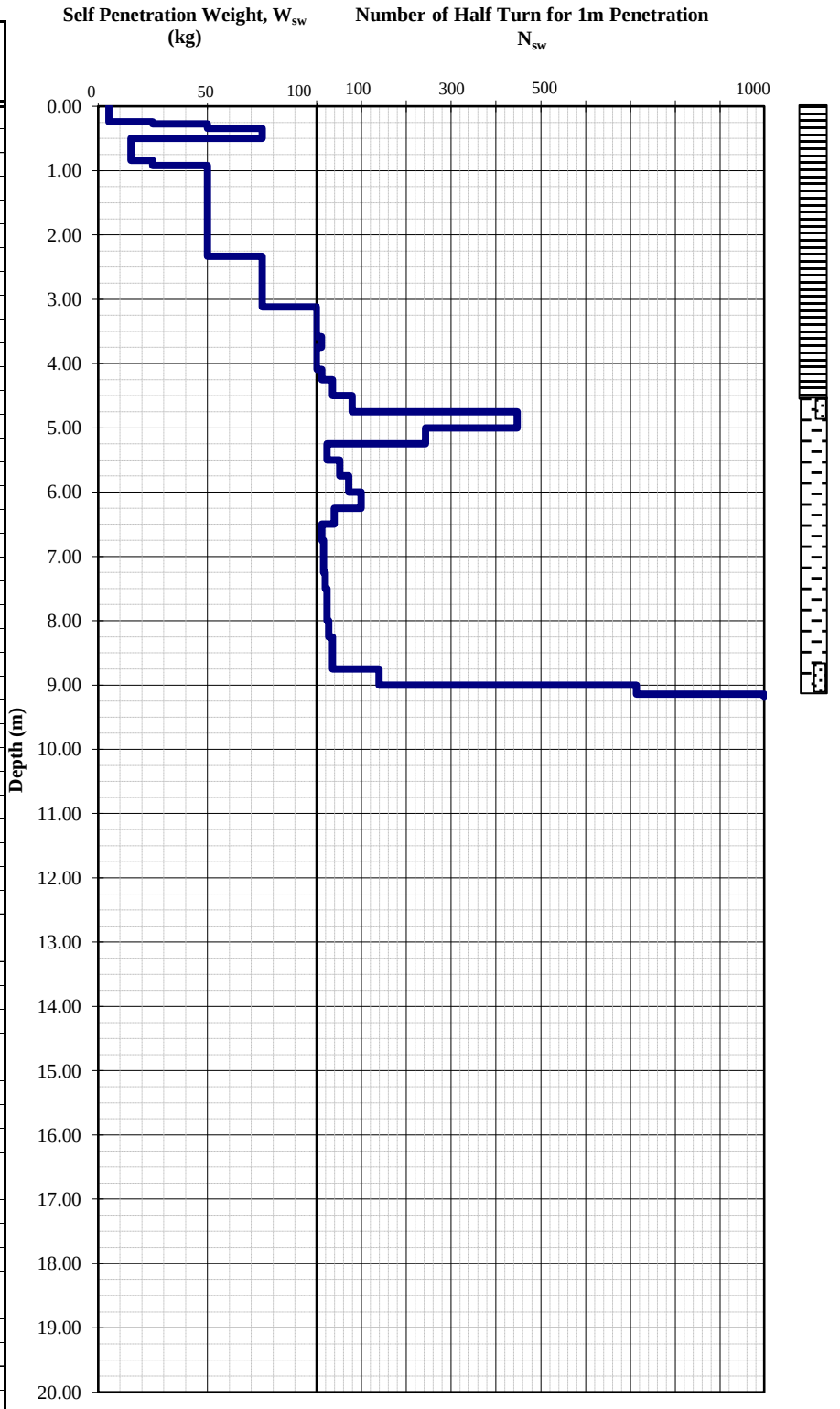


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-16-13
Location : N : 2400357.63 E :384023.21
Ground Level : +1.05mMSL

Tested Date : 7-Oct-14
Performed by : Tomohiro Sadamoto
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.24	5	N.A.	24	N.A.
0.24 - 0.27	25	N.A.	3	N.A.
0.27 - 0.34	50	N.A.	7	N.A.
0.34 - 0.50	75	N.A.	16	N.A.
0.50 - 0.84	15	N.A.	34	N.A.
0.84 - 0.92	25	N.A.	8	N.A.
0.92 - 1.00	50	N.A.	8	N.A.
1.00 - 1.50	50	N.A.	50	N.A.
1.50 - 2.00	50	N.A.	50	N.A.
2.00 - 2.33	50	N.A.	33	N.A.
2.33 - 2.75	75	N.A.	42	N.A.
2.75 - 3.12	75	N.A.	37	N.A.
3.12 - 3.25	100	N.A.	13	N.A.
3.25 - 3.58	100	N.A.	33	N.A.
3.58 - 3.75	100	2	17	12
3.75 - 4.09	100	N.A.	34	N.A.
4.09 - 4.25	100	2	16	13
4.25 - 4.50	100	9	25	36
4.50 - 4.75	100	20	25	80
4.75 - 5.00	100	112	25	448
5.00 - 5.25	100	61	25	244
5.25 - 5.50	100	6	25	24
5.50 - 5.75	100	13	25	52
5.75 - 6.00	100	18	25	72
6.00 - 6.25	100	25	25	100
6.25 - 6.50	100	10	25	40
6.50 - 6.75	100	3	25	12
6.75 - 7.00	100	4	25	16
7.00 - 7.25	100	4	25	16
7.25 - 7.50	100	5	25	20
7.50 - 7.75	100	6	25	24
7.75 - 8.00	100	6	25	24
8.00 - 8.25	100	7	25	28
8.25 - 8.50	100	9	25	36
8.50 - 8.75	100	9	25	36
8.75 - 9.00	100	35	25	140
9.00 - 9.14	100	100	14	714
9.14 - 9.19	100	50	5	1000
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

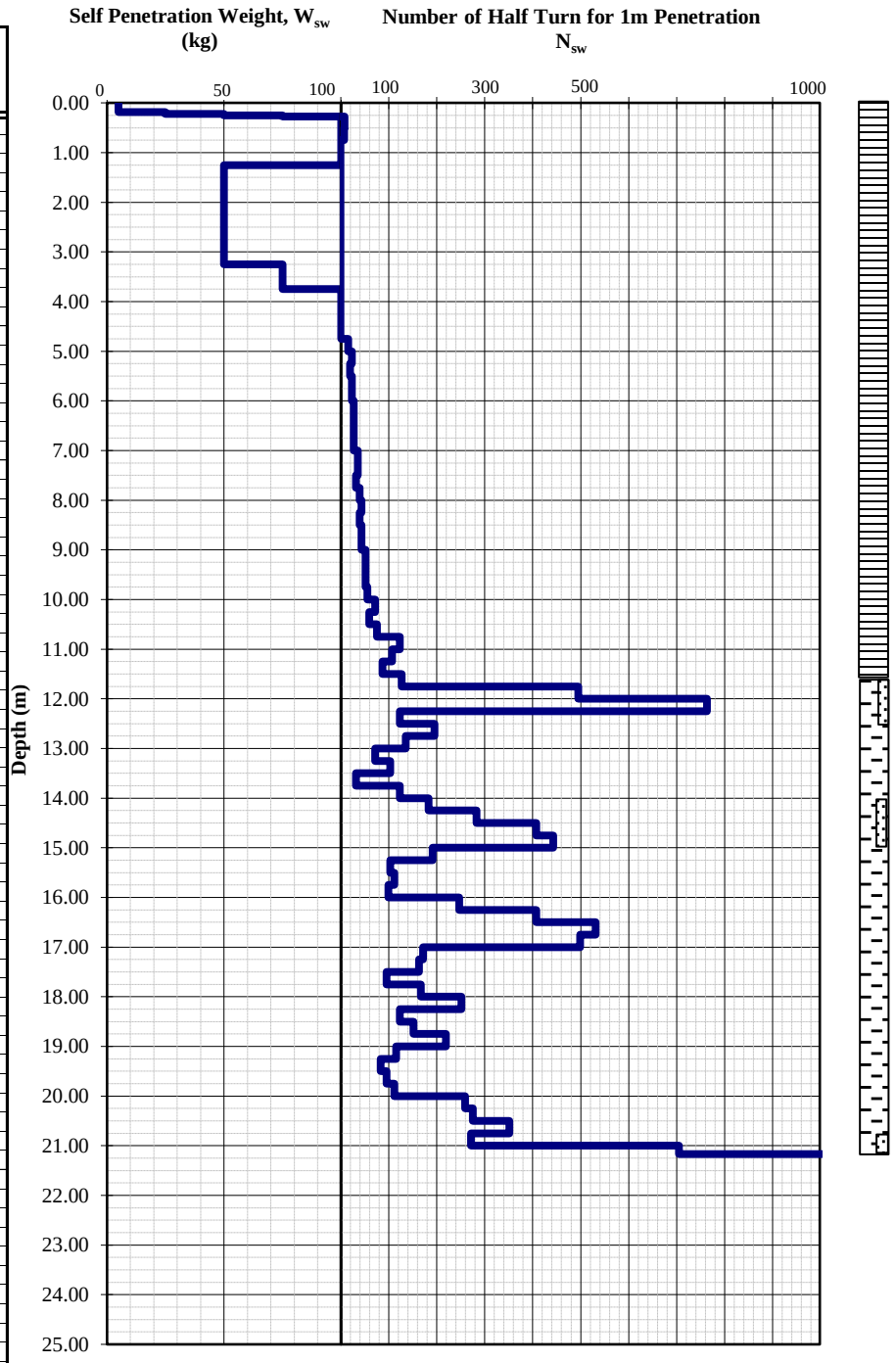


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-16-14
Location : N : 2400120.13 E : 384024.51
Ground Level : +1.11mMSL

Tested Date : 22-Sep-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.18	5	N.A.	18	N.A.
0.18 - 0.18	15	N.A.	0	N.A.
0.18 - 0.22	25	N.A.	4	N.A.
0.22 - 0.25	50	N.A.	3	N.A.
0.25 - 0.27	75	N.A.	2	N.A.
0.27 - 0.27	100	N.A.	0	N.A.
0.27 - 0.50	100	2	23	9
0.50 - 0.75	100	2	25	8
0.75 - 1.25	100	N.A.	50	N.A.
1.25 - 3.25	50	N.A.	200	N.A.
3.25 - 3.75	75	N.A.	50	N.A.
3.75 - 4.75	100	N.A.	100	N.A.
4.75 - 5.00	100	4	25	16
5.00 - 5.25	100	6	25	24
5.25 - 5.50	100	5	25	20
5.50 - 5.75	100	6	25	24
5.75 - 6.00	100	6	25	24
6.00 - 6.25	100	7	25	28
6.25 - 6.50	100	7	25	28
6.50 - 6.75	100	7	25	28
6.75 - 7.00	100	7	25	28
7.00 - 7.25	100	9	25	36
7.25 - 7.50	100	9	25	36
7.50 - 7.75	100	8	25	32
7.75 - 8.00	100	10	25	40
8.00 - 8.25	100	11	25	44
8.25 - 8.50	100	10	25	40
8.50 - 8.75	100	11	25	44
8.75 - 9.00	100	11	25	44
9.00 - 9.25	100	13	25	52
9.25 - 9.50	100	13	25	52
9.50 - 9.75	100	13	25	52
9.75 - 10.00	100	14	25	56
10.00 - 10.25	100	18	25	72
10.25 - 10.50	100	15	25	60
10.50 - 10.75	100	19	25	76
10.75 - 11.00	100	31	25	124
11.00 - 11.25	100	27	25	108
11.25 - 11.50	100	22	25	88
11.50 - 11.75	100	32	25	128
11.75 - 12.00	100	124	25	496
12.00 - 12.25	100	191	25	764
12.25 - 12.50	100	31	25	124
12.50 - 12.75	100	49	25	196
12.75 - 13.00	100	34	25	136
13.00 - 13.25	100	18	25	72
13.25 - 13.50	100	26	25	104
13.50 - 13.75	100	8	25	32
13.75 - 14.00	100	31	25	124
14.00 - 14.25	100	46	25	184
14.25 - 14.50	100	71	25	284
14.50 - 14.75	100	102	25	408
14.75 - 15.00	100	111	25	444
15.00 - 15.25	100	48	25	192
15.25 - 15.50	100	26	25	104
15.50 - 15.75	100	28	25	112
15.75 - 16.00	100	25	25	100
16.00 - 16.25	100	62	25	248
16.25 - 16.50	100	102	25	408
16.50 - 16.75	100	133	25	532
16.75 - 17.00	100	125	25	500
17.00 - 17.25	100	43	25	172
17.25 - 17.50	100	41	25	164
17.50 - 17.75	100	24	25	96
17.75 - 18.00	100	42	25	168
18.00 - 18.25	100	63	25	252
18.25 - 18.50	100	31	25	124
18.50 - 18.75	100	38	25	152
18.75 - 19.00	100	55	25	220
19.00 - 19.25	100	29	25	116
19.25 - 19.50	100	21	25	84
19.50 - 19.75	100	24	25	96
19.75 - 20.00	100	28	25	112
20.00 - 20.25	100	65	25	260
20.25 - 20.50	100	69	25	276
20.50 - 20.75	100	88	25	352
20.75 - 21.00	100	68	25	272
21.00 - 21.17	100	120	17	706
21.17 - 21.20	100	50	3	1667
-				

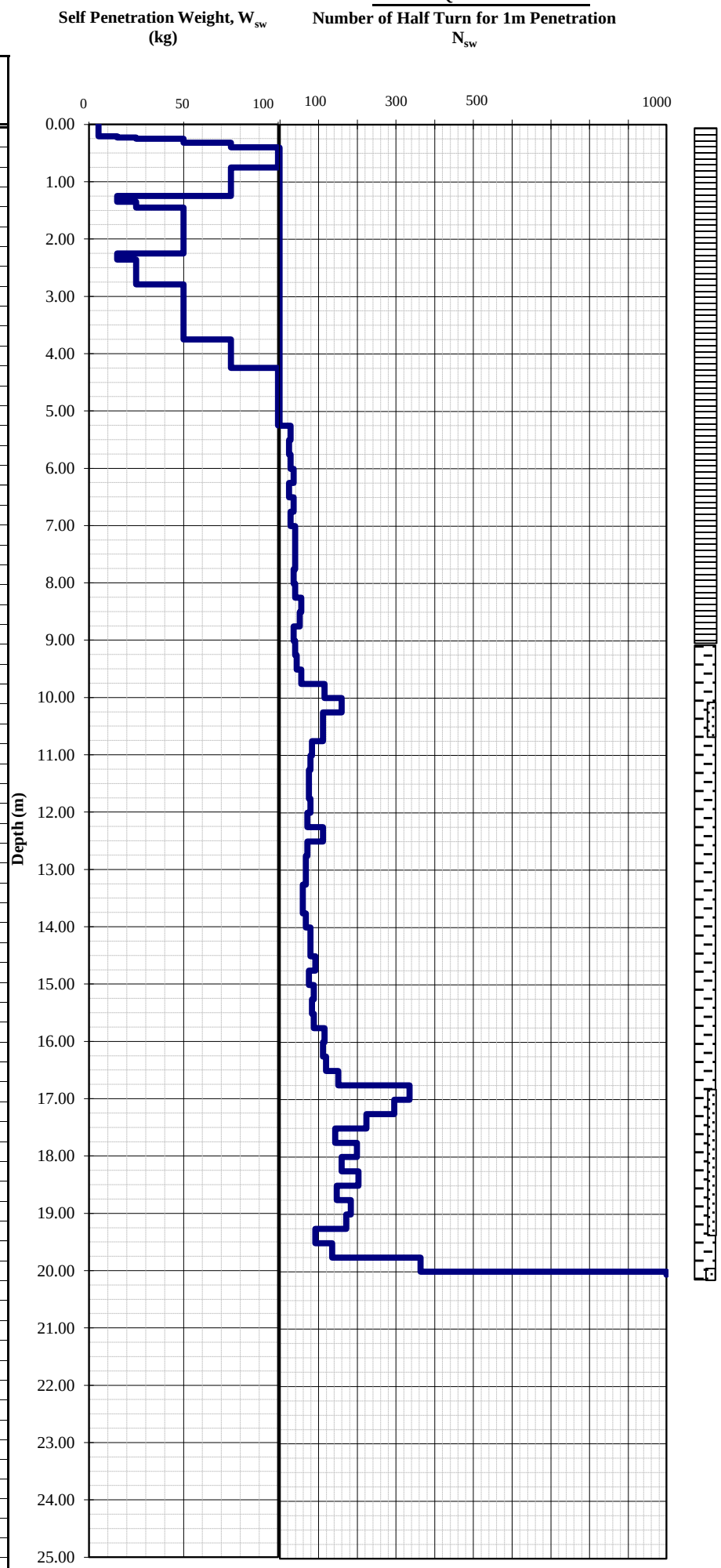


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : -
Test No. : SW-16-15
Location : N : 2399918.38 E :384020.89
Ground Level : +1.21mMSL

Tested Date : 3-Oct-14
Performed by : Tomohiro Sadamoto
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.21	5	N.A.	21	N.A.
0.21 - 0.23	15	N.A.	2	N.A.
0.23 - 0.25	25	N.A.	2	N.A.
0.25 - 0.32	50	N.A.	7	N.A.
0.32 - 0.40	75	N.A.	8	N.A.
0.40 - 0.75	100	N.A.	35	N.A.
0.75 - 1.25	75	N.A.	50	N.A.
1.25 - 1.35	15	N.A.	10	N.A.
1.35 - 1.45	25	N.A.	10	N.A.
1.45 - 1.75	50	N.A.	30	N.A.
1.75 - 2.25	50	N.A.	50	N.A.
2.25 - 2.36	15	N.A.	11	N.A.
2.36 - 2.75	25	N.A.	39	N.A.
2.75 - 2.79	25	N.A.	4	N.A.
2.79 - 3.25	50	N.A.	46	N.A.
3.25 - 3.75	50	N.A.	50	N.A.
3.75 - 4.25	75	N.A.	50	N.A.
4.25 - 4.75	100	N.A.	50	N.A.
4.75 - 5.25	100	N.A.	50	N.A.
5.25 - 5.50	100	7	25	28
5.50 - 5.75	100	6	25	24
5.75 - 6.00	100	7	25	28
6.00 - 6.25	100	9	25	36
6.25 - 6.50	100	6	25	24
6.50 - 6.75	100	9	25	36
6.75 - 7.00	100	7	25	28
7.00 - 7.25	100	10	25	40
7.25 - 7.50	100	10	25	40
7.50 - 7.75	100	10	25	40
7.75 - 8.00	100	9	25	36
8.00 - 8.25	100	10	25	40
8.25 - 8.50	100	14	25	56
8.50 - 8.75	100	13	25	52
8.75 - 9.00	100	9	25	36
9.00 - 9.25	100	10	25	40
9.25 - 9.50	100	11	25	44
9.50 - 9.75	100	14	25	56
9.75 - 10.00	100	29	25	116
10.00 - 10.25	100	40	25	160
10.25 - 10.50	100	28	25	112
10.50 - 10.75	100	28	25	112
10.75 - 11.00	100	21	25	84
11.00 - 11.25	100	20	25	80
11.25 - 11.50	100	19	25	76
11.50 - 11.75	100	19	25	76
11.75 - 12.00	100	20	25	80
12.00 - 12.25	100	18	25	72
12.25 - 12.50	100	28	25	112
12.50 - 12.75	100	18	25	72
12.75 - 13.00	100	17	25	68
13.00 - 13.25	100	17	25	68
13.25 - 13.50	100	15	25	60
13.50 - 13.75	100	15	25	60
13.75 - 14.00	100	17	25	68
14.00 - 14.25	100	20	25	80
14.25 - 14.50	100	20	25	80
14.50 - 14.75	100	23	25	92
14.75 - 15.00	100	19	25	76
15.00 - 15.25	100	22	25	88
15.25 - 15.50	100	21	25	84
15.50 - 15.75	100	22	25	88
15.75 - 16.00	100	29	25	116
16.00 - 16.25	100	28	25	112
16.25 - 16.50	100	30	25	120
16.50 - 16.75	100	38	25	152
16.75 - 17.00	100	84	25	336
17.00 - 17.25	100	74	25	296
17.25 - 17.50	100	56	25	224
17.50 - 17.75	100	36	25	144
17.75 - 18.00	100	50	25	200
18.00 - 18.25	100	40	25	160
18.25 - 18.50	100	51	25	204
18.50 - 18.75	100	37	25	148
18.75 - 19.00	100	46	25	184
19.00 - 19.25	100	43	25	172
19.25 - 19.50	100	23	25	92
19.50 - 19.75	100	34	25	136
19.75 - 20.00	100	91	25	364
20.00 - 20.05	100	50	5	1000

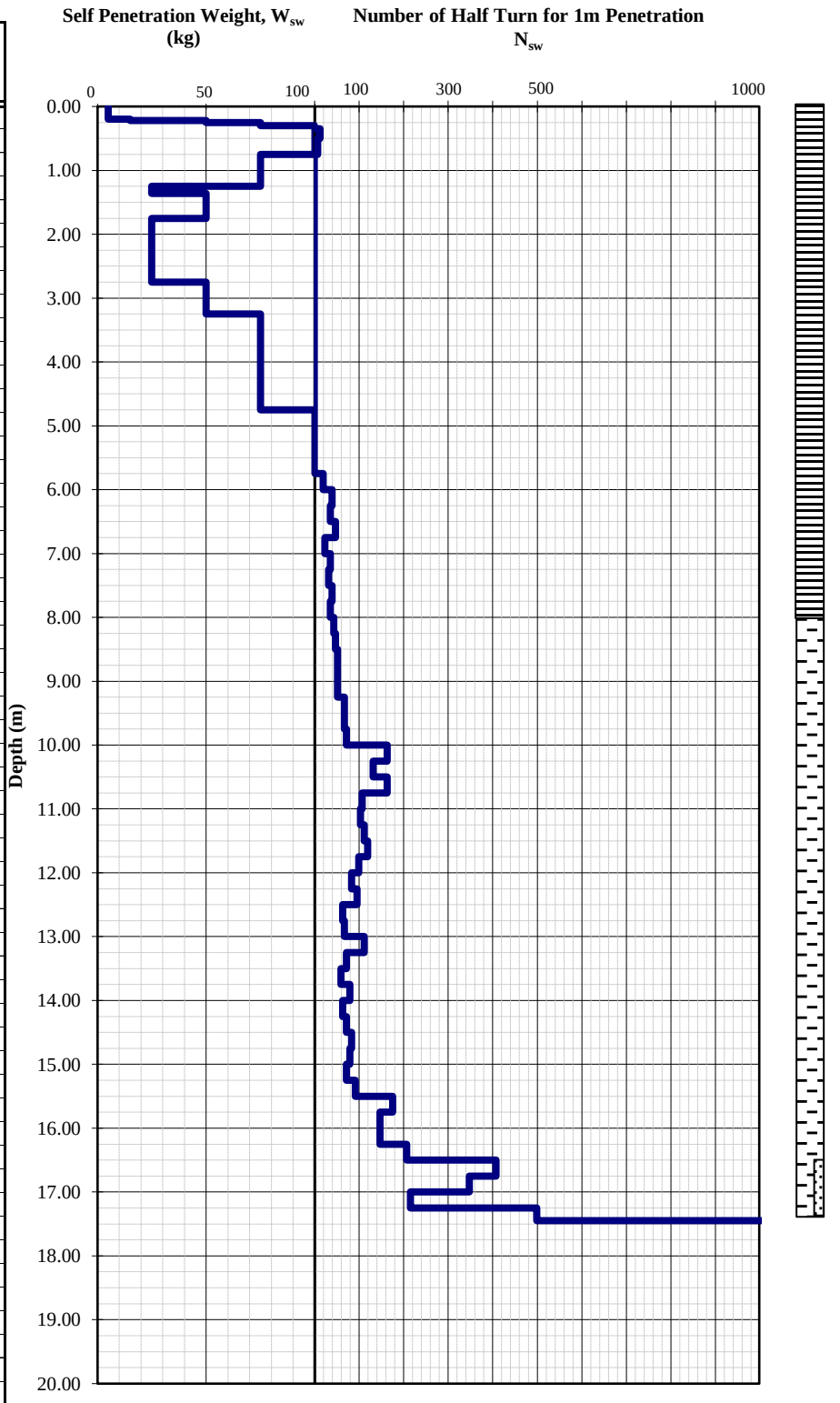


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-16-17
Location : N : 2399681.52 E :384023.40
Ground Level : +1.08mMSL

Tested Date : 3-Oct-14
Performed by : Tomohiro Sadamoto
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.20	5	N.A.	20	N.A.
0.20 - 0.22	15	N.A.	2	N.A.
0.22 - 0.22	25	N.A.	0	N.A.
0.22 - 0.25	50	N.A.	3	N.A.
0.25 - 0.30	75	N.A.	5	N.A.
0.30 - 0.35	100	N.A.	5	N.A.
0.35 - 0.50	100	2	15	13
0.50 - 0.75	100	2	25	8
0.75 - 0.75	100	N.A.	0	N.A.
0.75 - 1.25	75	N.A.	50	N.A.
1.25 - 1.36	25	N.A.	11	N.A.
1.36 - 1.75	50	N.A.	39	N.A.
1.75 - 2.25	25	N.A.	50	N.A.
2.25 - 2.75	25	N.A.	50	N.A.
2.75 - 2.95	50	N.A.	20	N.A.
2.95 - 3.25	50	N.A.	30	N.A.
3.25 - 3.75	75	N.A.	50	N.A.
3.75 - 4.25	75	N.A.	50	N.A.
4.25 - 4.75	75	N.A.	50	N.A.
4.75 - 5.25	100	N.A.	50	N.A.
5.25 - 5.75	100	N.A.	50	N.A.
5.75 - 6.00	100	5	25	20
6.00 - 6.25	100	10	25	40
6.25 - 6.50	100	9	25	36
6.50 - 6.75	100	12	25	48
6.75 - 7.00	100	6	25	24
7.00 - 7.25	100	9	25	36
7.25 - 7.50	100	8	25	32
7.50 - 7.75	100	10	25	40
7.75 - 8.00	100	9	25	36
8.00 - 8.25	100	11	25	44
8.25 - 8.50	100	12	25	48
8.50 - 8.75	100	13	25	52
8.75 - 9.00	100	13	25	52
9.00 - 9.25	100	13	25	52
9.25 - 9.50	100	17	25	68
9.50 - 9.75	100	17	25	68
9.75 - 10.00	100	18	25	72
10.00 - 10.25	100	41	25	164
10.25 - 10.50	100	33	25	132
10.50 - 10.75	100	41	25	164
10.75 - 11.00	100	27	25	108
11.00 - 11.25	100	26	25	104
11.25 - 11.50	100	28	25	112
11.50 - 11.75	100	30	25	120
11.75 - 12.00	100	25	25	100
12.00 - 12.25	100	21	25	84
12.25 - 12.50	100	24	25	96
12.50 - 12.75	100	16	25	64
12.75 - 13.00	100	17	25	68
13.00 - 13.25	100	28	25	112
13.25 - 13.50	100	18	25	72
13.50 - 13.75	100	15	25	60
13.75 - 14.00	100	20	25	80
14.00 - 14.25	100	16	25	64
14.25 - 14.50	100	18	25	72
14.50 - 14.75	100	21	25	84
14.75 - 15.00	100	20	25	80
15.00 - 15.25	100	18	25	72
15.25 - 15.50	100	23	25	92
15.50 - 15.75	100	44	25	176
15.75 - 16.00	100	37	25	148
16.00 - 16.25	100	37	25	148
16.25 - 16.50	100	52	25	208
16.50 - 16.75	100	102	25	408
16.75 - 17.00	100	87	25	348
17.00 - 17.25	100	54	25	216
17.25 - 17.45	100	100	20	500
17.45 - 17.48	100	50	3	1667

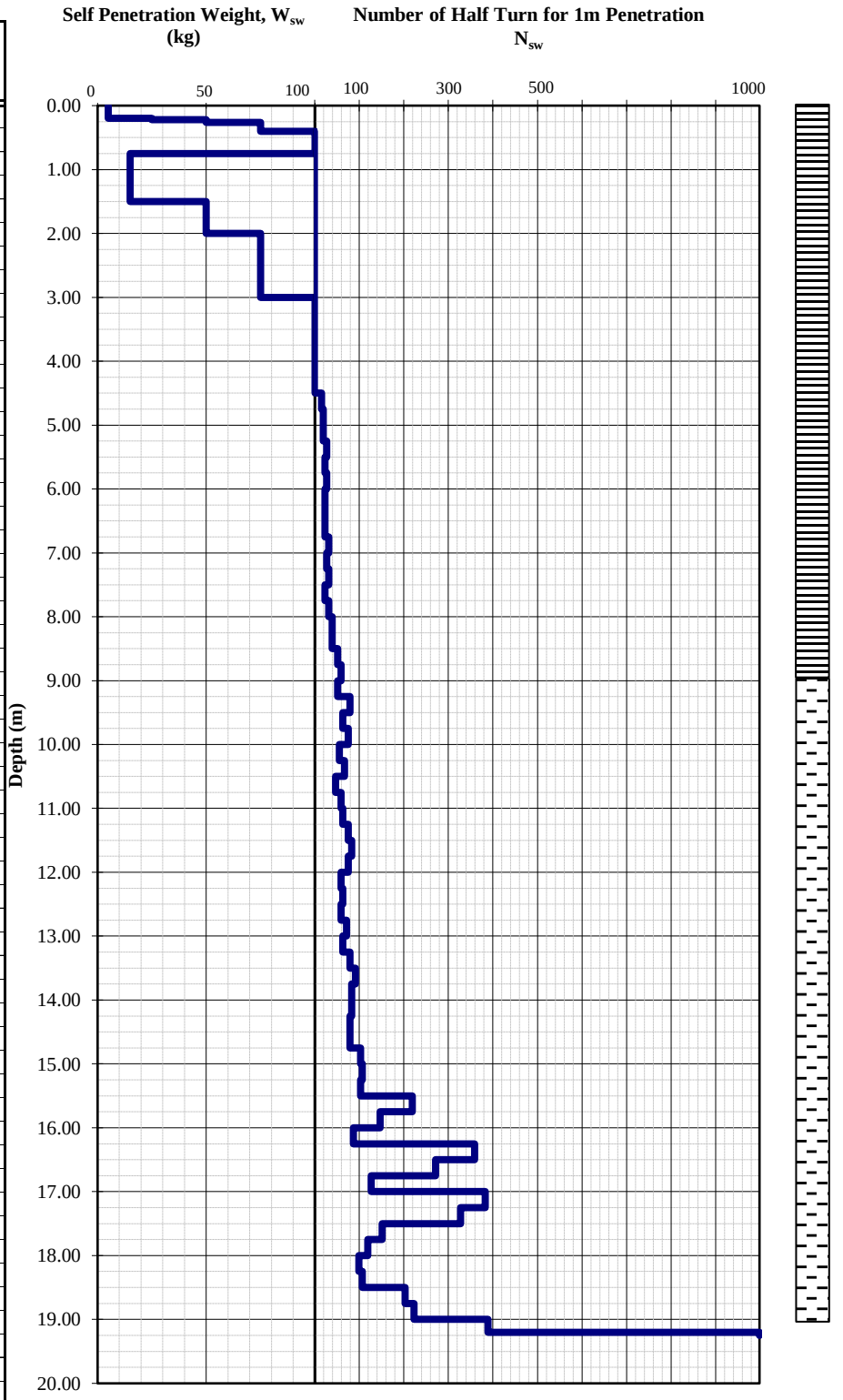


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-17-14
Location : N : 2400120.00 E : 384179.12
Ground Level : +0.82mMSL

Tested Date : 20-Sep-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.20	5	N.A.	20	N.A.
0.20 - 0.20	15	N.A.	0	N.A.
0.20 - 0.22	25	N.A.	2	N.A.
0.22 - 0.26	50	N.A.	4	N.A.
0.26 - 0.40	75	N.A.	14	N.A.
0.40 - 0.75	100	N.A.	35	N.A.
0.75 - 1.50	15	N.A.	75	N.A.
1.50 - 2.00	50	N.A.	50	N.A.
2.00 - 3.00	75	N.A.	100	N.A.
3.00 - 4.50	100	N.A.	150	N.A.
4.50 - 4.75	100	4	25	16
4.75 - 5.00	100	5	25	20
5.00 - 5.25	100	5	25	20
5.25 - 5.50	100	7	25	28
5.50 - 5.75	100	6	25	24
5.75 - 6.00	100	7	25	28
6.00 - 6.25	100	6	25	24
6.25 - 6.50	100	6	25	24
6.50 - 6.75	100	6	25	24
6.75 - 7.00	100	8	25	32
7.00 - 7.25	100	7	25	28
7.25 - 7.50	100	8	25	32
7.50 - 7.75	100	6	25	24
7.75 - 8.00	100	8	25	32
8.00 - 8.25	100	10	25	40
8.25 - 8.50	100	10	25	40
8.50 - 8.75	100	13	25	52
8.75 - 9.00	100	15	25	60
9.00 - 9.25	100	13	25	52
9.25 - 9.50	100	20	25	80
9.50 - 9.75	100	16	25	64
9.75 - 10.00	100	19	25	76
10.00 - 10.25	100	14	25	56
10.25 - 10.50	100	17	25	68
10.50 - 10.75	100	12	25	48
10.75 - 11.00	100	15	25	60
11.00 - 11.25	100	16	25	64
11.25 - 11.50	100	19	25	76
11.50 - 11.75	100	21	25	84
11.75 - 12.00	100	19	25	76
12.00 - 12.25	100	15	25	60
12.25 - 12.50	100	16	25	64
12.50 - 12.75	100	15	25	60
12.75 - 13.00	100	18	25	72
13.00 - 13.25	100	16	25	64
13.25 - 13.50	100	20	25	80
13.50 - 13.75	100	23	25	92
13.75 - 14.00	100	21	25	84
14.00 - 14.25	100	21	25	84
14.25 - 14.50	100	20	25	80
14.50 - 14.75	100	20	25	80
14.75 - 15.00	100	26	25	104
15.00 - 15.25	100	27	25	108
15.25 - 15.50	100	26	25	104
15.50 - 15.75	100	55	25	220
15.75 - 16.00	100	37	25	148
16.00 - 16.25	100	22	25	88
16.25 - 16.50	100	90	25	360
16.50 - 16.75	100	68	25	272
16.75 - 17.00	100	32	25	128
17.00 - 17.25	100	96	25	384
17.25 - 17.50	100	82	25	328
17.50 - 17.75	100	38	25	152
17.75 - 18.00	100	30	25	120
18.00 - 18.25	100	25	25	100
18.25 - 18.50	100	27	25	108
18.50 - 18.75	100	51	25	204
18.75 - 19.00	100	56	25	224
19.00 - 19.20	100	78	20	390
19.20 - 19.25	100	50	5	1000

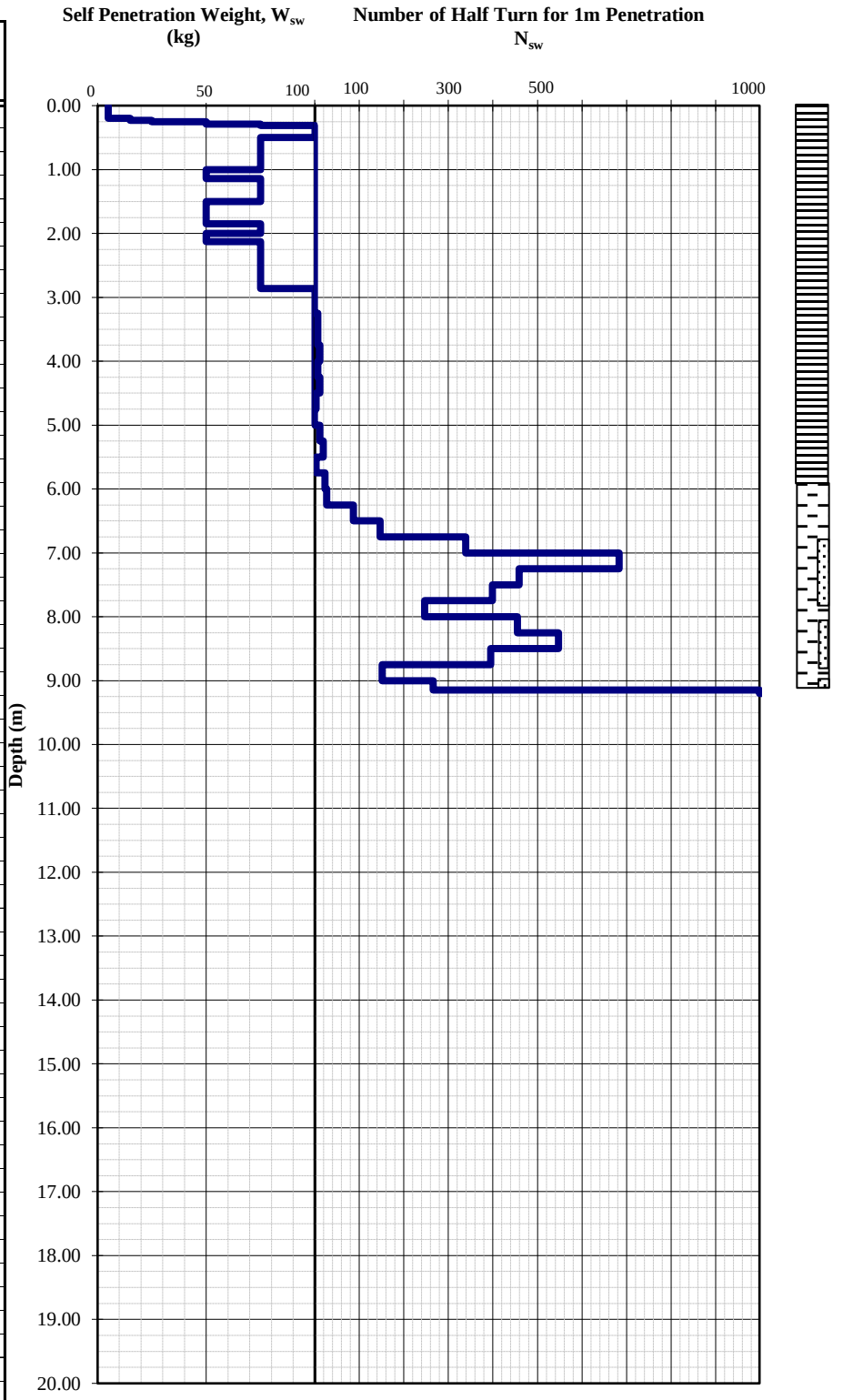


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-18-11
Location : N :2400724.93 E :384338.02
Ground Level : +1.00mMSL

Tested Date : 22-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.20	5	N.A.	20	N.A.
0.20 - 0.23	15	N.A.	3	N.A.
0.23 - 0.25	25	N.A.	2	N.A.
0.25 - 0.29	50	N.A.	4	N.A.
0.29 - 0.31	75	N.A.	2	N.A.
0.31 - 0.50	100	N.A.	19	N.A.
0.50 - 1.00	75	N.A.	50	N.A.
1.00 - 1.14	50	N.A.	14	N.A.
1.14 - 1.50	75	N.A.	36	N.A.
1.50 - 1.85	50	N.A.	35	N.A.
1.85 - 2.00	75	N.A.	15	N.A.
2.00 - 2.13	50	N.A.	13	N.A.
2.13 - 2.86	75	N.A.	73	N.A.
2.86 - 3.25	100	N.A.	39	N.A.
3.25 - 3.50	100	2	25	8
3.50 - 3.75	100	2	25	8
3.75 - 4.00	100	3	25	12
4.00 - 4.25	100	2	25	8
4.25 - 4.50	100	3	25	12
4.50 - 4.75	100	1	25	4
4.75 - 5.00	100	N.A.	25	N.A.
5.00 - 5.25	100	3	25	12
5.25 - 5.50	100	5	25	20
5.50 - 5.75	100	1	25	4
5.75 - 6.00	100	6	25	24
6.00 - 6.25	100	7	25	28
6.25 - 6.50	100	22	25	88
6.50 - 6.75	100	37	25	148
6.75 - 7.00	100	85	25	340
7.00 - 7.25	100	171	25	684
7.25 - 7.50	100	115	25	460
7.50 - 7.75	100	100	25	400
7.75 - 8.00	100	62	25	248
8.00 - 8.25	100	114	25	456
8.25 - 8.50	100	137	25	548
8.50 - 8.75	100	99	25	396
8.75 - 9.00	100	38	25	152
9.00 - 9.15	100	40	15	267
9.15 - 9.20	100	50	5	1000
9.20 - 9.24	100	50	4	1250
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

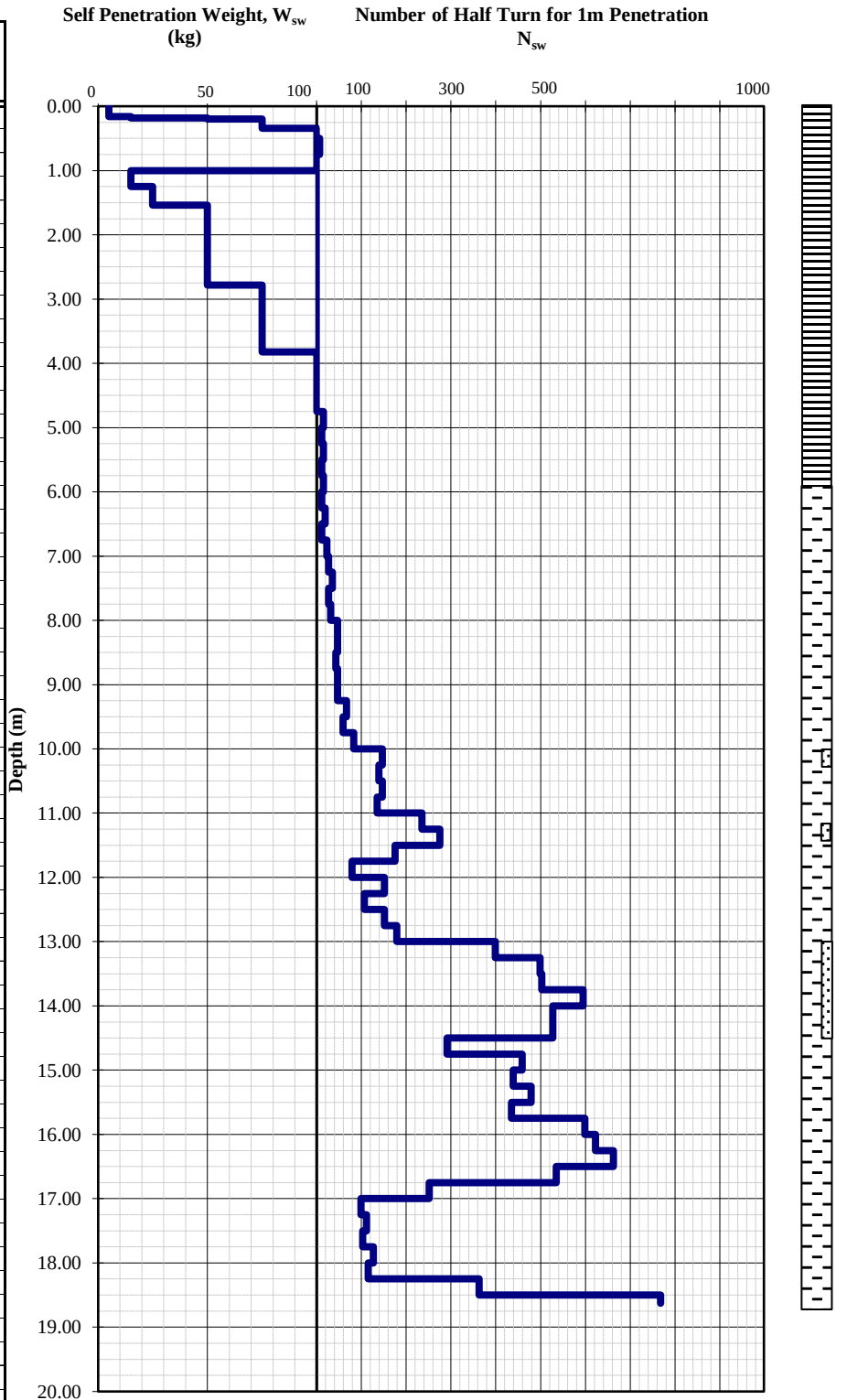


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-18-12
Location : N :2400523.71 E : 384334.91
Ground Level : +1.04mMSL

Tested Date : 2014/10/20to2014/10/21
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.16	5	N.A.	16	N.A.
0.16 - 0.18	15	N.A.	2	N.A.
0.18 - 0.18	25	N.A.	0	N.A.
0.18 - 0.20	50	N.A.	2	N.A.
0.20 - 0.34	75	N.A.	14	N.A.
0.34 - 0.50	100	N.A.	16	N.A.
0.50 - 0.75	100	2	25	8
0.75 - 1.00	100	N.A.	25	N.A.
1.00 - 1.25	15	N.A.	25	N.A.
1.25 - 1.54	25	N.A.	29	N.A.
1.54 - 2.78	50	N.A.	124	N.A.
2.78 - 3.82	75	N.A.	104	N.A.
3.82 - 4.75	100	N.A.	93	N.A.
4.75 - 5.00	100	4	25	16
5.00 - 5.25	100	3	25	12
5.25 - 5.50	100	4	25	16
5.50 - 5.75	100	3	25	12
5.75 - 6.00	100	4	25	16
6.00 - 6.25	100	3	25	12
6.25 - 6.50	100	5	25	20
6.50 - 6.75	100	3	25	12
6.75 - 7.00	100	6	25	24
7.00 - 7.25	100	7	25	28
7.25 - 7.50	100	9	25	36
7.50 - 7.75	100	7	25	28
7.75 - 8.00	100	8	25	32
8.00 - 8.25	100	12	25	48
8.25 - 8.50	100	12	25	48
8.50 - 8.75	100	11	25	44
8.75 - 9.00	100	12	25	48
9.00 - 9.25	100	12	25	48
9.25 - 9.50	100	17	25	68
9.50 - 9.75	100	15	25	60
9.75 - 10.00	100	21	25	84
10.00 - 10.25	100	37	25	148
10.25 - 10.50	100	35	25	140
10.50 - 10.75	100	37	25	148
10.75 - 11.00	100	34	25	136
11.00 - 11.25	100	59	25	236
11.25 - 11.50	100	69	25	276
11.50 - 11.75	100	44	25	176
11.75 - 12.00	100	20	25	80
12.00 - 12.25	100	38	25	152
12.25 - 12.50	100	27	25	108
12.50 - 12.75	100	38	25	152
12.75 - 13.00	100	45	25	180
13.00 - 13.25	100	100	25	400
13.25 - 13.50	100	125	25	500
13.50 - 13.75	100	126	25	504
13.75 - 14.00	100	149	25	596
14.00 - 14.25	100	132	25	528
14.25 - 14.50	100	132	25	528
14.50 - 14.75	100	73	25	292
14.75 - 15.00	100	115	25	460
15.00 - 15.25	100	110	25	440
15.25 - 15.50	100	120	25	480
15.50 - 15.75	100	109	25	436
15.75 - 16.00	100	150	25	600
16.00 - 16.25	100	156	25	624
16.25 - 16.50	100	166	25	664
16.50 - 16.75	100	134	25	536
16.75 - 17.00	100	63	25	252
17.00 - 17.25	100	25	25	100
17.25 - 17.50	100	28	25	112
17.50 - 17.75	100	26	25	104
17.75 - 18.00	100	32	25	128
18.00 - 18.25	100	29	25	116
18.25 - 18.50	100	91	25	364
18.50 - 18.63	100	100	13	769
-				
-				
-				
-				
-				

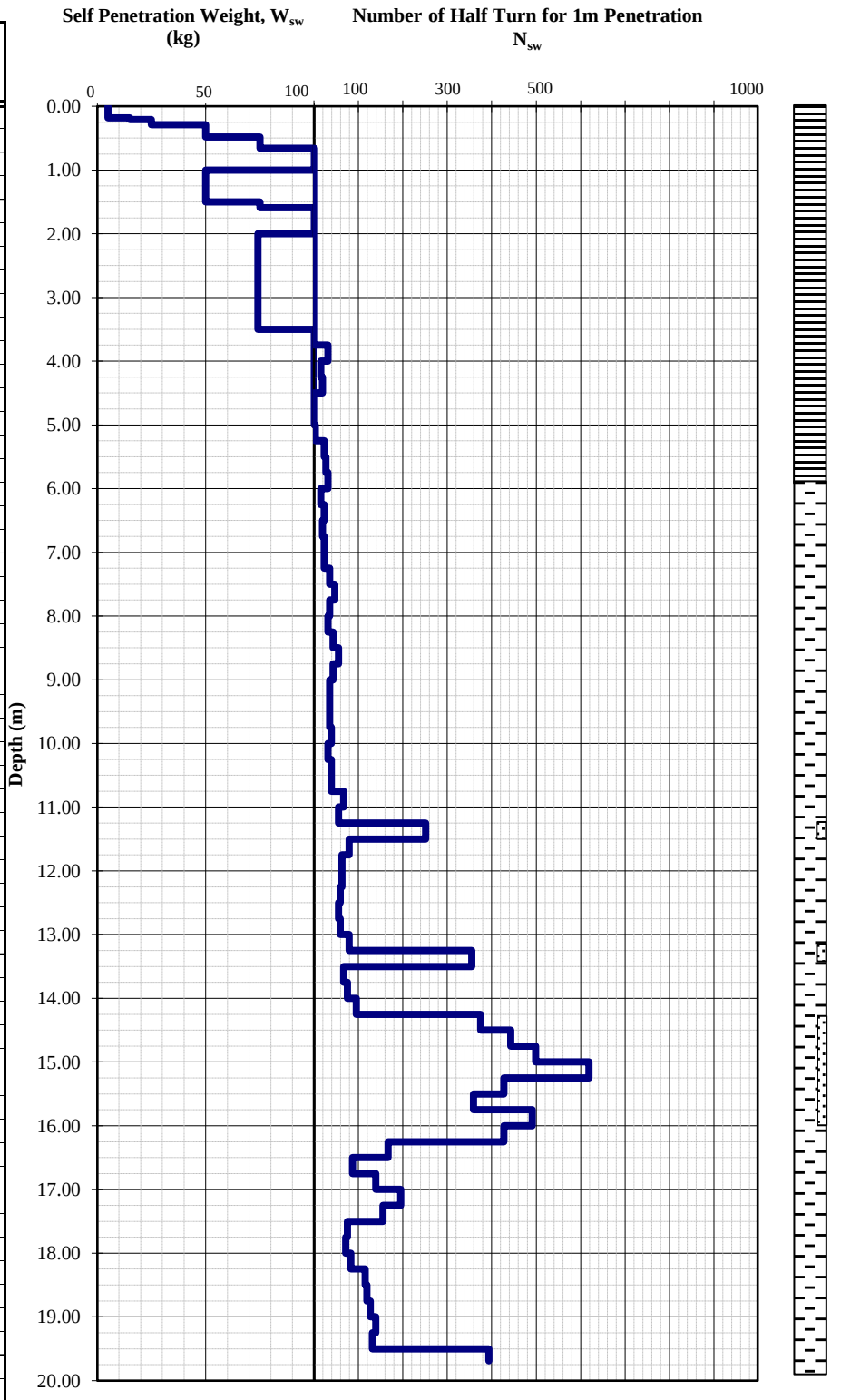


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-18-13
Location : N : 2400358.21 E : 384337.66
Ground Level : +0.90mMSL

Tested Date : 2014/10/19to2014/10/20
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.18	5	N.A.	18	N.A.
0.18 - 0.21	15	N.A.	3	N.A.
0.21 - 0.29	25	N.A.	8	N.A.
0.29 - 0.48	50	N.A.	19	N.A.
0.48 - 0.66	75	N.A.	18	N.A.
0.66 - 1.00	100	N.A.	34	N.A.
1.00 - 1.50	50	N.A.	50	N.A.
1.50 - 1.59	75	N.A.	9	N.A.
1.59 - 2.00	100	N.A.	41	N.A.
2.00 - 3.50	74	N.A.	150	N.A.
3.50 - 3.75	100	N.A.	25	N.A.
3.75 - 4.00	100	8	25	32
4.00 - 4.25	100	4	25	16
4.25 - 4.50	100	5	25	20
4.50 - 5.00	100	N.A.	50	N.A.
5.00 - 5.25	100	1	25	4
5.25 - 5.50	100	6	25	24
5.50 - 5.75	100	7	25	28
5.75 - 6.00	100	8	25	32
6.00 - 6.25	100	4	25	16
6.25 - 6.50	100	6	25	24
6.50 - 6.75	100	5	25	20
6.75 - 7.00	100	6	25	24
7.00 - 7.25	100	6	25	24
7.25 - 7.50	100	9	25	36
7.50 - 7.75	100	12	25	48
7.75 - 8.00	100	9	25	36
8.00 - 8.25	100	8	25	32
8.25 - 8.50	100	11	25	44
8.50 - 8.75	100	14	25	56
8.75 - 9.00	100	11	25	44
9.00 - 9.25	100	9	25	36
9.25 - 9.50	100	9	25	36
9.50 - 9.75	100	9	25	36
9.75 - 10.00	100	10	25	40
10.00 - 10.25	100	8	25	32
10.25 - 10.50	100	10	25	40
10.50 - 10.75	100	10	25	40
10.75 - 11.00	100	17	25	68
11.00 - 11.25	100	14	25	56
11.25 - 11.50	100	63	25	252
11.50 - 11.75	100	20	25	80
11.75 - 12.00	100	16	25	64
12.00 - 12.25	100	16	25	64
12.25 - 12.50	100	15	25	60
12.50 - 12.75	100	14	25	56
12.75 - 13.00	100	15	25	60
13.00 - 13.25	100	20	25	80
13.25 - 13.50	100	89	25	356
13.50 - 13.75	100	17	25	68
13.75 - 14.00	100	19	25	76
14.00 - 14.25	100	24	25	96
14.25 - 14.50	100	94	25	376
14.50 - 14.75	100	111	25	444
14.75 - 15.00	100	125	25	500
15.00 - 15.25	100	155	25	620
15.25 - 15.50	100	107	25	428
15.50 - 15.75	100	90	25	360
15.75 - 16.00	100	123	25	492
16.00 - 16.25	100	107	25	428
16.25 - 16.50	100	42	25	168
16.50 - 16.75	100	22	25	88
16.75 - 17.00	100	35	25	140
17.00 - 17.25	100	49	25	196
17.25 - 17.50	100	39	25	156
17.50 - 17.75	100	19	25	76
17.75 - 18.00	100	18	25	72
18.00 - 18.25	100	21	25	84
18.25 - 18.50	100	29	25	116
18.50 - 18.75	100	30	25	120
18.75 - 19.00	100	32	25	128
19.00 - 19.25	100	35	25	140
19.25 - 19.50	100	33	25	132
19.50 - 19.69	100	75	19	395

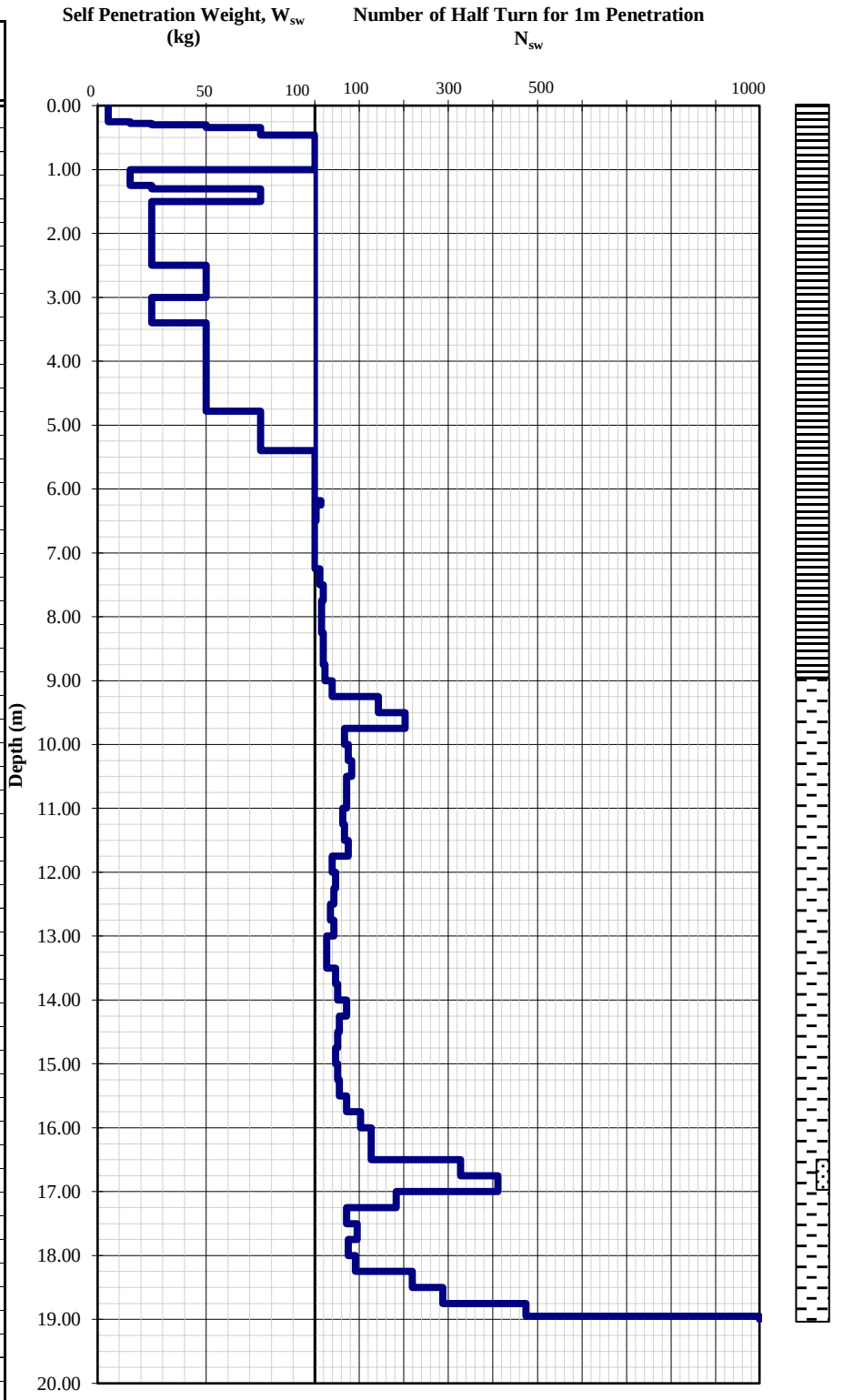


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-18-14
Location : N : 2400120.17 E : 384337.61
Ground Level : +0.84mMSL

Tested Date : 2014/9/19～9/20
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.25	5	N.A.	25	N.A.
0.25 - 0.28	15	N.A.	3	N.A.
0.28 - 0.30	25	N.A.	2	N.A.
0.30 - 0.34	50	N.A.	4	N.A.
0.34 - 0.46	75	N.A.	12	N.A.
0.46 - 1.00	100	N.A.	54	N.A.
1.00 - 1.25	15	N.A.	25	N.A.
1.25 - 1.30	25	N.A.	5	N.A.
1.30 - 1.50	75	N.A.	20	N.A.
1.50 - 2.50	25	N.A.	100	N.A.
2.50 - 3.00	50	N.A.	50	N.A.
3.00 - 3.40	25	N.A.	40	N.A.
3.40 - 4.78	50	N.A.	138	N.A.
4.78 - 5.40	75	N.A.	62	N.A.
5.40 - 6.18	100	N.A.	78	N.A.
6.18 - 6.25	100	1	7	14
6.25 - 6.50	100	1	25	4
6.50 - 7.00	100	N.A.	50	N.A.
7.00 - 7.25	100	N.A.	25	N.A.
7.25 - 7.50	100	3	25	12
7.50 - 7.75	100	5	25	20
7.75 - 8.00	100	4	25	16
8.00 - 8.25	100	4	25	16
8.25 - 8.50	100	5	25	20
8.50 - 8.75	100	5	25	20
8.75 - 9.00	100	6	25	24
9.00 - 9.25	100	10	25	40
9.25 - 9.50	100	36	25	144
9.50 - 9.75	100	51	25	204
9.75 - 10.00	100	17	25	68
10.00 - 10.25	100	19	25	76
10.25 - 10.50	100	21	25	84
10.50 - 10.75	100	18	25	72
10.75 - 11.00	100	18	25	72
11.00 - 11.25	100	16	25	64
11.25 - 11.50	100	17	25	68
11.50 - 11.75	100	19	25	76
11.75 - 12.00	100	10	25	40
12.00 - 12.25	100	12	25	48
12.25 - 12.50	100	11	25	44
12.50 - 12.75	100	9	25	36
12.75 - 13.00	100	11	25	44
13.00 - 13.25	100	7	25	28
13.25 - 13.50	100	7	25	28
13.50 - 13.75	100	12	25	48
13.75 - 14.00	100	13	25	52
14.00 - 14.25	100	18	25	72
14.25 - 14.50	100	14	25	56
14.50 - 14.75	100	13	25	52
14.75 - 15.00	100	12	25	48
15.00 - 15.25	100	13	25	52
15.25 - 15.50	100	14	25	56
15.50 - 15.75	100	18	25	72
15.75 - 16.00	100	26	25	104
16.00 - 16.25	100	32	25	128
16.25 - 16.50	100	32	25	128
16.50 - 16.75	100	82	25	328
16.75 - 17.00	100	103	25	412
17.00 - 17.25	100	46	25	184
17.25 - 17.50	100	18	25	72
17.50 - 17.75	100	24	25	96
17.75 - 18.00	100	19	25	76
18.00 - 18.25	100	23	25	92
18.25 - 18.50	100	55	25	220
18.50 - 18.75	100	72	25	288
18.75 - 18.95	100	95	20	475
18.95 - 19.00	100	50	5	1000

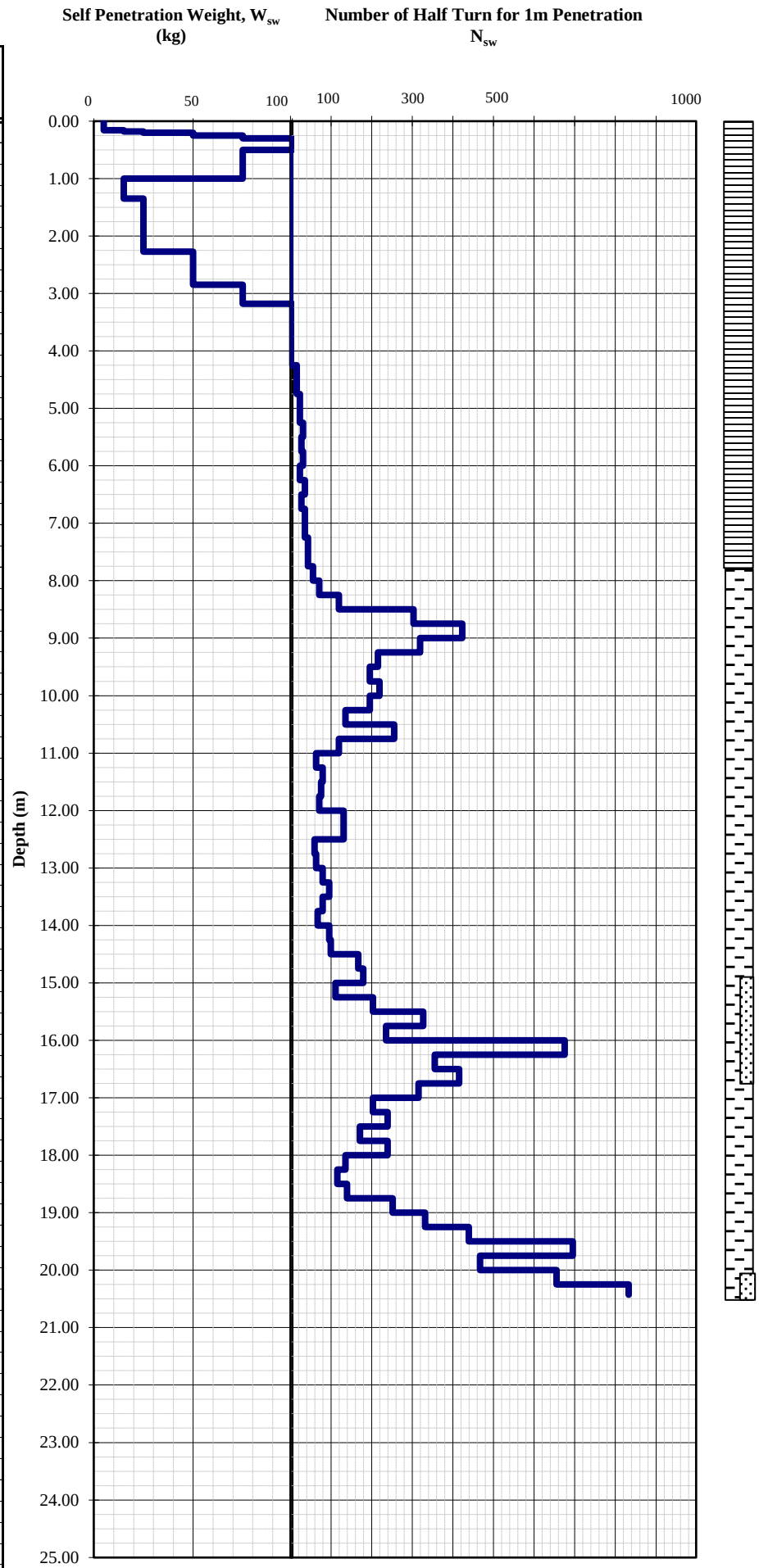


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : -
Test No. : SW-18-15
Location : N : 2399919.02 E :384338.04
Ground Level : +0.89mMSL

Tested Date : 18-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.16	5	N.A.	16	N.A.
0.16 - 0.18	15	N.A.	2	N.A.
0.18 - 0.20	25	N.A.	2	N.A.
0.20 - 0.25	50	N.A.	5	N.A.
0.25 - 0.30	75	N.A.	5	N.A.
0.30 - 0.50	100	N.A.	20	N.A.
0.50 - 1.00	75	N.A.	50	N.A.
1.00 - 1.35	15	N.A.	35	N.A.
1.35 - 2.27	25	N.A.	92	N.A.
2.27 - 2.85	50	N.A.	58	N.A.
2.85 - 3.18	75	N.A.	33	N.A.
3.18 - 4.25	100	N.A.	107	N.A.
4.25 - 4.50	100	4	25	16
4.50 - 4.75	100	4	25	16
4.75 - 5.00	100	6	25	24
5.00 - 5.25	100	6	25	24
5.25 - 5.50	100	8	25	32
5.50 - 5.75	100	7	25	28
5.75 - 6.00	100	8	25	32
6.00 - 6.25	100	6	25	24
6.25 - 6.50	100	9	25	36
6.50 - 6.75	100	7	25	28
6.75 - 7.00	100	9	25	36
7.00 - 7.25	100	9	25	36
7.25 - 7.50	100	11	25	44
7.50 - 7.75	100	11	25	44
7.75 - 8.00	100	14	25	56
8.00 - 8.25	100	18	25	72
8.25 - 8.50	100	30	25	120
8.50 - 8.75	100	76	25	304
8.75 - 9.00	100	106	25	424
9.00 - 9.25	100	80	25	320
9.25 - 9.50	100	54	25	216
9.50 - 9.75	100	49	25	196
9.75 - 10.00	100	55	25	220
10.00 - 10.25	100	49	25	196
10.25 - 10.50	100	34	25	136
10.50 - 10.75	100	64	25	256
10.75 - 11.00	100	30	25	120
11.00 - 11.25	100	16	25	64
11.25 - 11.50	100	20	25	80
11.50 - 11.75	100	19	25	76
11.75 - 12.00	100	18	25	72
12.00 - 12.25	100	33	25	132
12.25 - 12.50	100	33	25	132
12.50 - 12.75	100	15	25	60
12.75 - 13.00	100	16	25	64
13.00 - 13.25	100	20	25	80
13.25 - 13.50	100	24	25	96
13.50 - 13.75	100	20	25	80
13.75 - 14.00	100	17	25	68
14.00 - 14.25	100	24	25	96
14.25 - 14.50	100	25	25	100
14.50 - 14.75	100	42	25	168
14.75 - 15.00	100	45	25	180
15.00 - 15.25	100	28	25	112
15.25 - 15.50	100	51	25	204
15.50 - 15.75	100	82	25	328
15.75 - 16.00	100	59	25	236
16.00 - 16.25	100	169	25	676
16.25 - 16.50	100	89	25	356
16.50 - 16.75	100	104	25	416
16.75 - 17.00	100	79	25	316
17.00 - 17.25	100	51	25	204
17.25 - 17.50	100	60	25	240
17.50 - 17.75	100	43	25	172
17.75 - 18.00	100	60	25	240
18.00 - 18.25	100	34	25	136
18.25 - 18.50	100	29	25	116
18.50 - 18.75	100	35	25	140
18.75 - 19.00	100	63	25	252
19.00 - 19.25	100	83	25	332
19.25 - 19.50	100	110	25	440
19.50 - 19.75	100	174	25	696
19.75 - 20.00	100	117	25	468
20.00 - 20.25	100	164	25	656
20.25 - 20.43	100	150	18	833

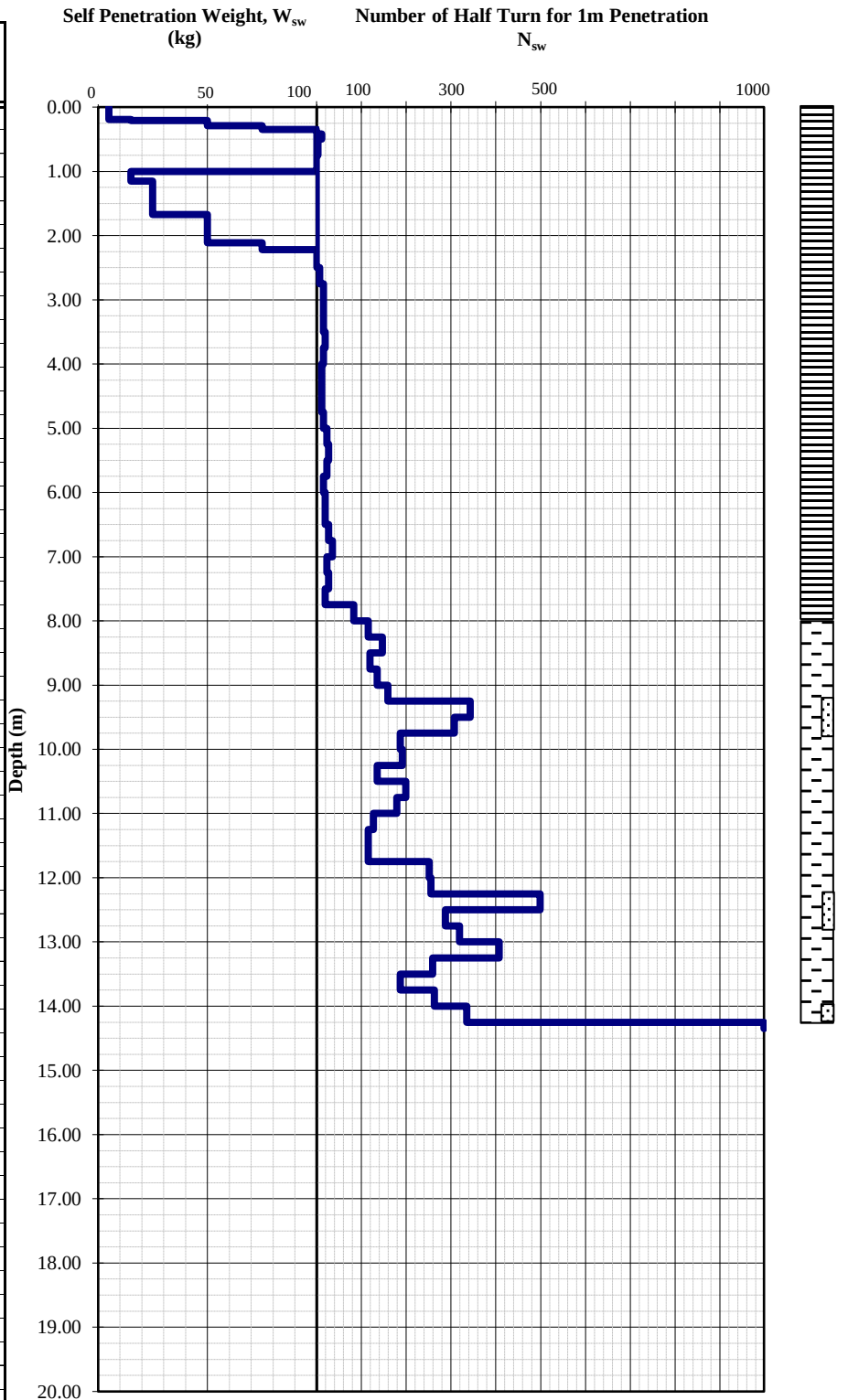


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-18-17
Location : N : 2399681.505 E : 384338.12
Ground Level : +1.07mMSL

Tested Date : 2014/10/16～10/17
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.19	5	N.A.	19	N.A.
0.19 - 0.21	15	N.A.	2	N.A.
0.21 - 0.21	25	N.A.	0	N.A.
0.21 - 0.29	50	N.A.	8	N.A.
0.29 - 0.35	75	N.A.	6	N.A.
0.35 - 0.42	100	N.A.	7	N.A.
0.42 - 0.50	100	1	8	13
0.50 - 0.75	100	1	25	4
0.75 - 1.00	100	N.A.	25	N.A.
1.00 - 1.15	15	N.A.	15	N.A.
1.15 - 1.67	25	N.A.	52	N.A.
1.67 - 2.11	50	N.A.	44	N.A.
2.11 - 2.22	75	N.A.	11	N.A.
2.22 - 2.50	100	N.A.	28	N.A.
2.50 - 2.75	100	2	25	8
2.75 - 3.00	100	4	25	16
3.00 - 3.25	100	4	25	16
3.25 - 3.50	100	4	25	16
3.50 - 3.75	100	5	25	20
3.75 - 4.00	100	4	25	16
4.00 - 4.25	100	3	25	12
4.25 - 4.50	100	3	25	12
4.50 - 4.75	100	3	25	12
4.75 - 5.00	100	4	25	16
5.00 - 5.25	100	6	25	24
5.25 - 5.50	100	7	25	28
5.50 - 5.75	100	6	25	24
5.75 - 6.00	100	4	25	16
6.00 - 6.25	100	5	25	20
6.25 - 6.50	100	5	25	20
6.50 - 6.75	100	7	25	28
6.75 - 7.00	100	9	25	36
7.00 - 7.25	100	6	25	24
7.25 - 7.50	100	7	25	28
7.50 - 7.75	100	5	25	20
7.75 - 8.00	100	21	25	84
8.00 - 8.25	100	29	25	116
8.25 - 8.50	100	37	25	148
8.50 - 8.75	100	30	25	120
8.75 - 9.00	100	34	25	136
9.00 - 9.25	100	40	25	160
9.25 - 9.50	100	86	25	344
9.50 - 9.75	100	77	25	308
9.75 - 10.00	100	47	25	188
10.00 - 10.25	100	48	25	192
10.25 - 10.50	100	34	25	136
10.50 - 10.75	100	50	25	200
10.75 - 11.00	100	45	25	180
11.00 - 11.25	100	32	25	128
11.25 - 11.50	100	29	25	116
11.50 - 11.75	100	29	25	116
11.75 - 12.00	100	63	25	252
12.00 - 12.25	100	64	25	256
12.25 - 12.50	100	125	25	500
12.50 - 12.75	100	72	25	288
12.75 - 13.00	100	80	25	320
13.00 - 13.25	100	102	25	408
13.25 - 13.50	100	65	25	260
13.50 - 13.75	100	47	25	188
13.75 - 14.00	100	66	25	264
14.00 - 14.25	100	84	25	336
14.25 - 14.35	100	100	10	1000
-				
-				

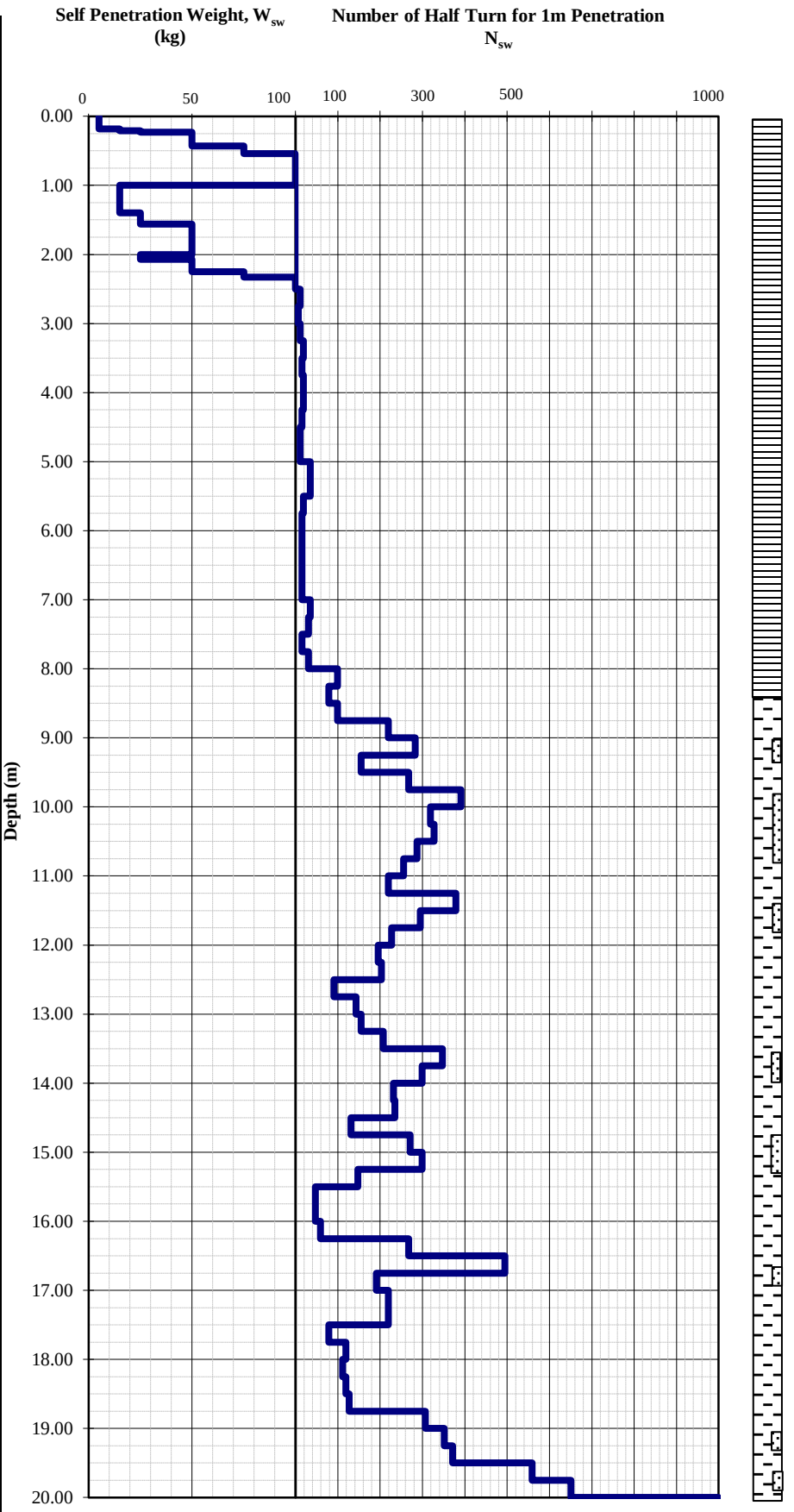


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-19-17
Location : N : 2399680.61 E : 384491.12
Ground Level : +1.13mMSL

Tested Date : 17-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.18	5	N.A.	18	N.A.
0.18 - 0.21	15	N.A.	3	N.A.
0.21 - 0.23	25	N.A.	2	N.A.
0.23 - 0.43	50	N.A.	20	N.A.
0.43 - 0.54	75	N.A.	11	N.A.
0.54 - 1.00	100	N.A.	46	N.A.
1.00 - 1.40	15	N.A.	40	N.A.
1.40 - 1.56	25	N.A.	16	N.A.
1.56 - 2.00	50	N.A.	44	N.A.
2.00 - 2.07	25	N.A.	7	N.A.
2.07 - 2.25	50	N.A.	18	N.A.
2.25 - 2.33	75	N.A.	8	N.A.
2.33 - 2.50	100	N.A.	17	N.A.
2.50 - 2.75	100	3	25	12
2.75 - 3.00	100	2	25	8
3.00 - 3.25	100	3	25	12
3.25 - 3.50	100	5	25	20
3.50 - 3.75	100	4	25	16
3.75 - 4.00	100	5	25	20
4.00 - 4.25	100	5	25	20
4.25 - 4.50	100	4	25	16
4.50 - 4.75	100	3	25	12
4.75 - 5.00	100	3	25	12
5.00 - 5.25	100	9	25	36
5.25 - 5.50	100	9	25	36
5.50 - 5.75	100	5	25	20
5.75 - 6.00	100	4	25	16
6.00 - 6.25	100	4	25	16
6.25 - 6.50	100	4	25	16
6.50 - 6.75	100	4	25	16
6.75 - 7.00	100	4	25	16
7.00 - 7.25	100	9	25	36
7.25 - 7.50	100	8	25	32
7.50 - 7.75	100	4	25	16
7.75 - 8.00	100	8	25	32
8.00 - 8.25	100	25	25	100
8.25 - 8.50	100	20	25	80
8.50 - 8.75	100	25	25	100
8.75 - 9.00	100	55	25	220
9.00 - 9.25	100	71	25	284
9.25 - 9.50	100	39	25	156
9.50 - 9.75	100	67	25	268
9.75 - 10.00	100	98	25	392
10.00 - 10.25	100	80	25	320
10.25 - 10.50	100	82	25	328
10.50 - 10.75	100	72	25	288
10.75 - 11.00	100	64	25	256
11.00 - 11.25	100	55	25	220
11.25 - 11.50	100	95	25	380
11.50 - 11.75	100	74	25	296
11.75 - 12.00	100	57	25	228
12.00 - 12.25	100	49	25	196
12.25 - 12.50	100	51	25	204
12.50 - 12.75	100	23	25	92
12.75 - 13.00	100	36	25	144
13.00 - 13.25	100	39	25	156
13.25 - 13.50	100	52	25	208
13.50 - 13.75	100	87	25	348
13.75 - 14.00	100	75	25	300
14.00 - 14.25	100	58	25	232
14.25 - 14.50	100	59	25	236
14.50 - 14.75	100	33	25	132
14.75 - 15.00	100	68	25	272
15.00 - 15.25	100	75	25	300
15.25 - 15.50	100	37	25	148
15.50 - 15.75	100	12	25	48
15.75 - 16.00	100	12	25	48
16.00 - 16.25	100	15	25	60
16.25 - 16.50	100	67	25	268
16.50 - 16.75	100	124	25	496
16.75 - 17.00	100	48	25	192
17.00 - 17.25	100	55	25	220
17.25 - 17.50	100	55	25	220
17.50 - 17.75	100	20	25	80
17.75 - 18.00	100	30	25	120
18.00 - 18.25	100	28	25	112
18.25 - 18.50	100	30	25	120
18.50 - 18.75	100	32	25	128
18.75 - 19.00	100	77	25	308
19.00 - 19.25	100	88	25	352
19.25 - 19.50	100	93	25	372
19.50 - 19.75	100	140	25	560
19.75 - 20.00	100	163	25	652
20.00 - 20.05	100	50	5	1000

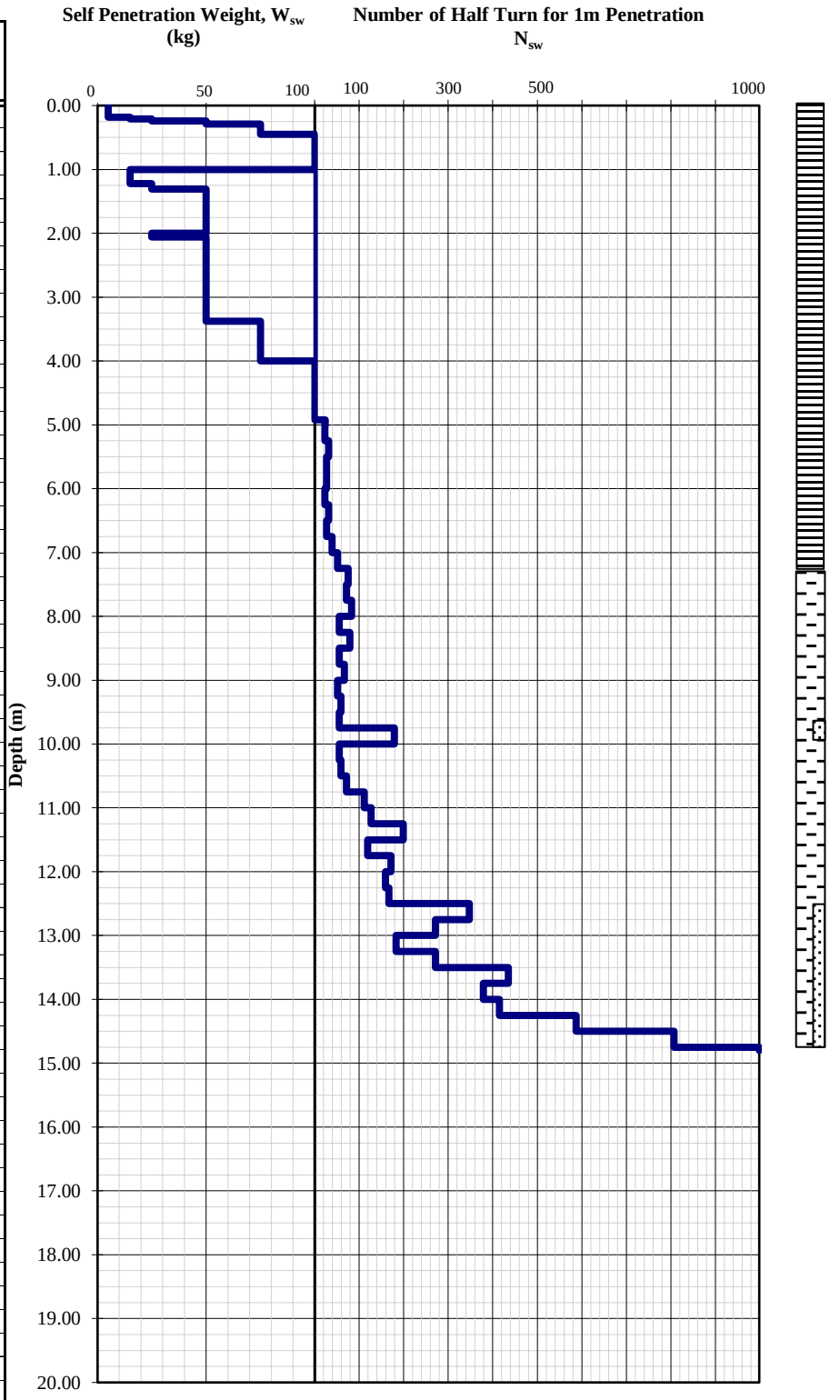


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-20-11
Location : N : 2400723.56 E :384642.02
Ground Level : MSL+0.98m

Tested Date : 8-Oct-14
Performed by : Tomohiro Sadamoto
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.18	5	N.A.	18	N.A.
0.18 - 0.21	15	N.A.	3	N.A.
0.21 - 0.24	25	N.A.	3	N.A.
0.24 - 0.29	50	N.A.	5	N.A.
0.29 - 0.45	75	N.A.	16	N.A.
0.45 - 0.50	100	N.A.	5	N.A.
0.50 - 1.00	100	N.A.	50	N.A.
1.00 - 1.22	15	N.A.	22	N.A.
1.22 - 1.31	25	N.A.	9	N.A.
1.31 - 1.50	50	N.A.	19	N.A.
1.50 - 2.00	50	N.A.	50	N.A.
2.00 - 2.06	25	N.A.	6	N.A.
2.06 - 2.50	50	N.A.	44	N.A.
2.50 - 3.00	50	N.A.	50	N.A.
3.00 - 3.38	50	N.A.	38	N.A.
3.38 - 3.50	75	N.A.	12	N.A.
3.50 - 4.00	75	N.A.	50	N.A.
4.00 - 4.50	100	N.A.	50	N.A.
4.50 - 4.92	100	N.A.	42	N.A.
4.92 - 5.00	100	2	8	25
5.00 - 5.25	100	6	25	24
5.25 - 5.50	100	8	25	32
5.50 - 5.75	100	7	25	28
5.75 - 6.00	100	7	25	28
6.00 - 6.25	100	6	25	24
6.25 - 6.50	100	8	25	32
6.50 - 6.75	100	7	25	28
6.75 - 7.00	100	10	25	40
7.00 - 7.25	100	13	25	52
7.25 - 7.50	100	19	25	76
7.50 - 7.75	100	18	25	72
7.75 - 8.00	100	21	25	84
8.00 - 8.25	100	14	25	56
8.25 - 8.50	100	20	25	80
8.50 - 8.75	100	14	25	56
8.75 - 9.00	100	17	25	68
9.00 - 9.25	100	13	25	52
9.25 - 9.50	100	15	25	60
9.50 - 9.75	100	14	25	56
9.75 - 10.00	100	45	25	180
10.00 - 10.25	100	14	25	56
10.25 - 10.50	100	15	25	60
10.50 - 10.75	100	18	25	72
10.75 - 11.00	100	28	25	112
11.00 - 11.25	100	32	25	128
11.25 - 11.50	100	50	25	200
11.50 - 11.75	100	30	25	120
11.75 - 12.00	100	43	25	172
12.00 - 12.25	100	40	25	160
12.25 - 12.50	100	42	25	168
12.50 - 12.75	100	87	25	348
12.75 - 13.00	100	68	25	272
13.00 - 13.25	100	46	25	184
13.25 - 13.50	100	68	25	272
13.50 - 13.75	100	109	25	436
13.75 - 14.00	100	95	25	380
14.00 - 14.25	100	104	25	416
14.25 - 14.50	100	147	25	588
14.50 - 14.75	100	202	25	808
14.75 - 14.80	100	50	5	1000
-				
-				

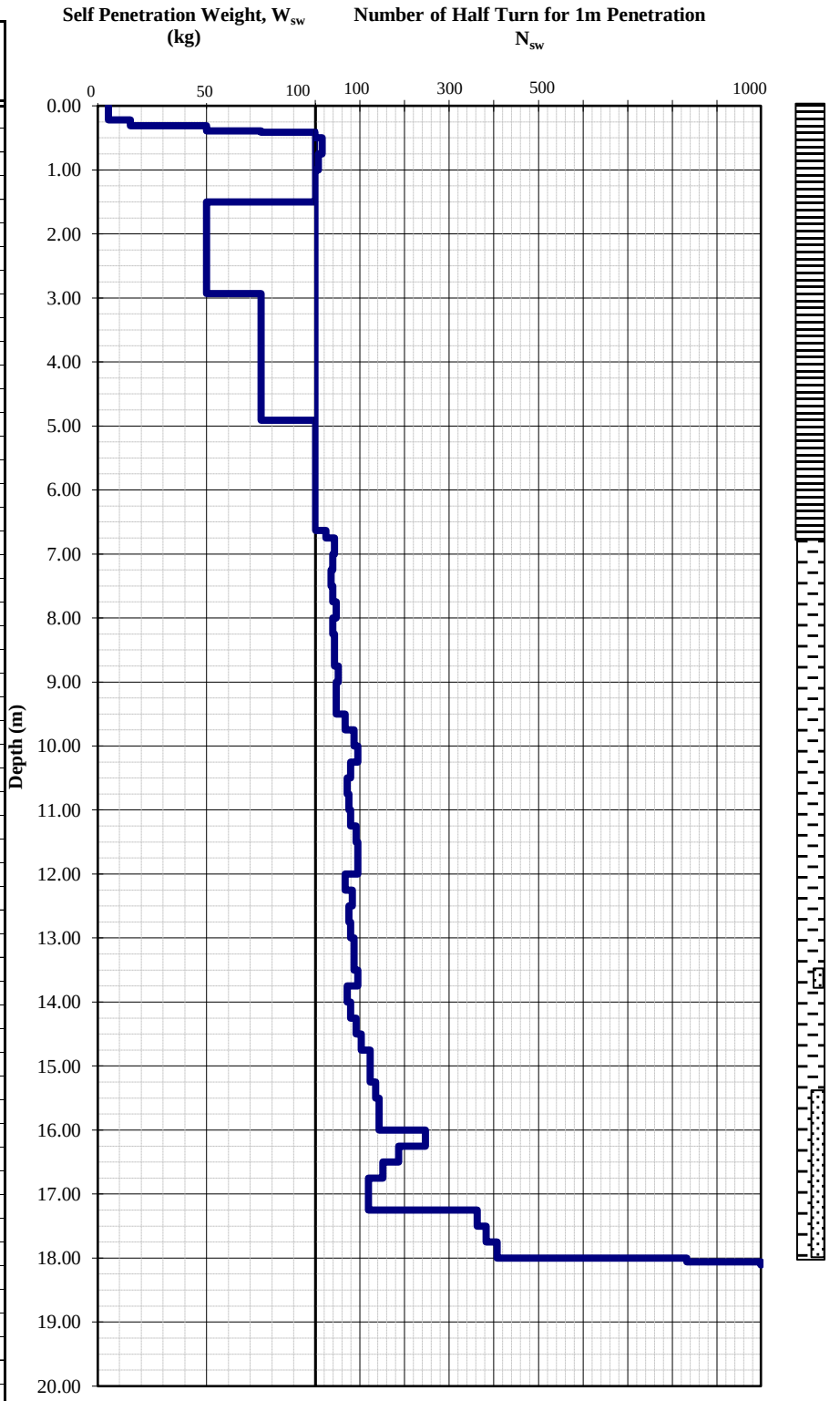


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-20-12
Location : N : 2400525.67 E :384643.55
Ground Level : +0.89mMSL

Tested Date : 9-Oct-14
Performed by : Tomohiro Sadamoto
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.22	5	N.A.	22	N.A.
0.22 - 0.31	15	N.A.	9	N.A.
0.31 - 0.31	25	N.A.	0	N.A.
0.31 - 0.39	50	N.A.	8	N.A.
0.39 - 0.41	75	N.A.	2	N.A.
0.41 - 0.50	100	N.A.	9	N.A.
0.50 - 0.75	100	4	25	16
0.75 - 1.00	100	2	25	8
1.00 - 1.50	100	N.A.	50	N.A.
1.50 - 2.00	50	N.A.	50	N.A.
2.00 - 2.50	50	N.A.	50	N.A.
2.50 - 2.93	50	N.A.	43	N.A.
2.93 - 3.00	75	N.A.	7	N.A.
3.00 - 3.50	75	N.A.	50	N.A.
3.50 - 4.00	75	N.A.	50	N.A.
4.00 - 4.50	75	N.A.	50	N.A.
4.50 - 4.91	75	N.A.	41	N.A.
4.91 - 5.00	100	N.A.	9	N.A.
5.00 - 5.50	100	N.A.	50	N.A.
5.50 - 6.00	100	N.A.	50	N.A.
6.00 - 6.50	100	N.A.	50	N.A.
6.50 - 6.63	100	N.A.	13	N.A.
6.63 - 6.75	100	3	12	25
6.75 - 7.00	100	11	25	44
7.00 - 7.25	100	10	25	40
7.25 - 7.50	100	9	25	36
7.50 - 7.75	100	10	25	40
7.75 - 8.00	100	12	25	48
8.00 - 8.25	100	10	25	40
8.25 - 8.50	100	11	25	44
8.50 - 8.75	100	11	25	44
8.75 - 9.00	100	13	25	52
9.00 - 9.25	100	12	25	48
9.25 - 9.50	100	12	25	48
9.50 - 9.75	100	17	25	68
9.75 - 10.00	100	22	25	88
10.00 - 10.25	100	24	25	96
10.25 - 10.50	100	20	25	80
10.50 - 10.75	100	18	25	72
10.75 - 11.00	100	19	25	76
11.00 - 11.25	100	20	25	80
11.25 - 11.50	100	23	25	92
11.50 - 11.75	100	24	25	96
11.75 - 12.00	100	24	25	96
12.00 - 12.25	100	17	25	68
12.25 - 12.50	100	21	25	84
12.50 - 12.75	100	19	25	76
12.75 - 13.00	100	20	25	80
13.00 - 13.25	100	22	25	88
13.25 - 13.50	100	22	25	88
13.50 - 13.75	100	24	25	96
13.75 - 14.00	100	18	25	72
14.00 - 14.25	100	20	25	80
14.25 - 14.50	100	23	25	92
14.50 - 14.75	100	26	25	104
14.75 - 15.00	100	31	25	124
15.00 - 15.25	100	31	25	124
15.25 - 15.50	100	34	25	136
15.50 - 15.75	100	36	25	144
15.75 - 16.00	100	36	25	144
16.00 - 16.25	100	62	25	248
16.25 - 16.50	100	47	25	188
16.50 - 16.75	100	38	25	152
16.75 - 17.00	100	30	25	120
17.00 - 17.25	100	30	25	120
17.25 - 17.50	100	91	25	364
17.50 - 17.75	100	96	25	384
17.75 - 18.00	100	102	25	408
18.00 - 18.06	100	50	6	833
18.06 - 18.11	100	50	5	1000

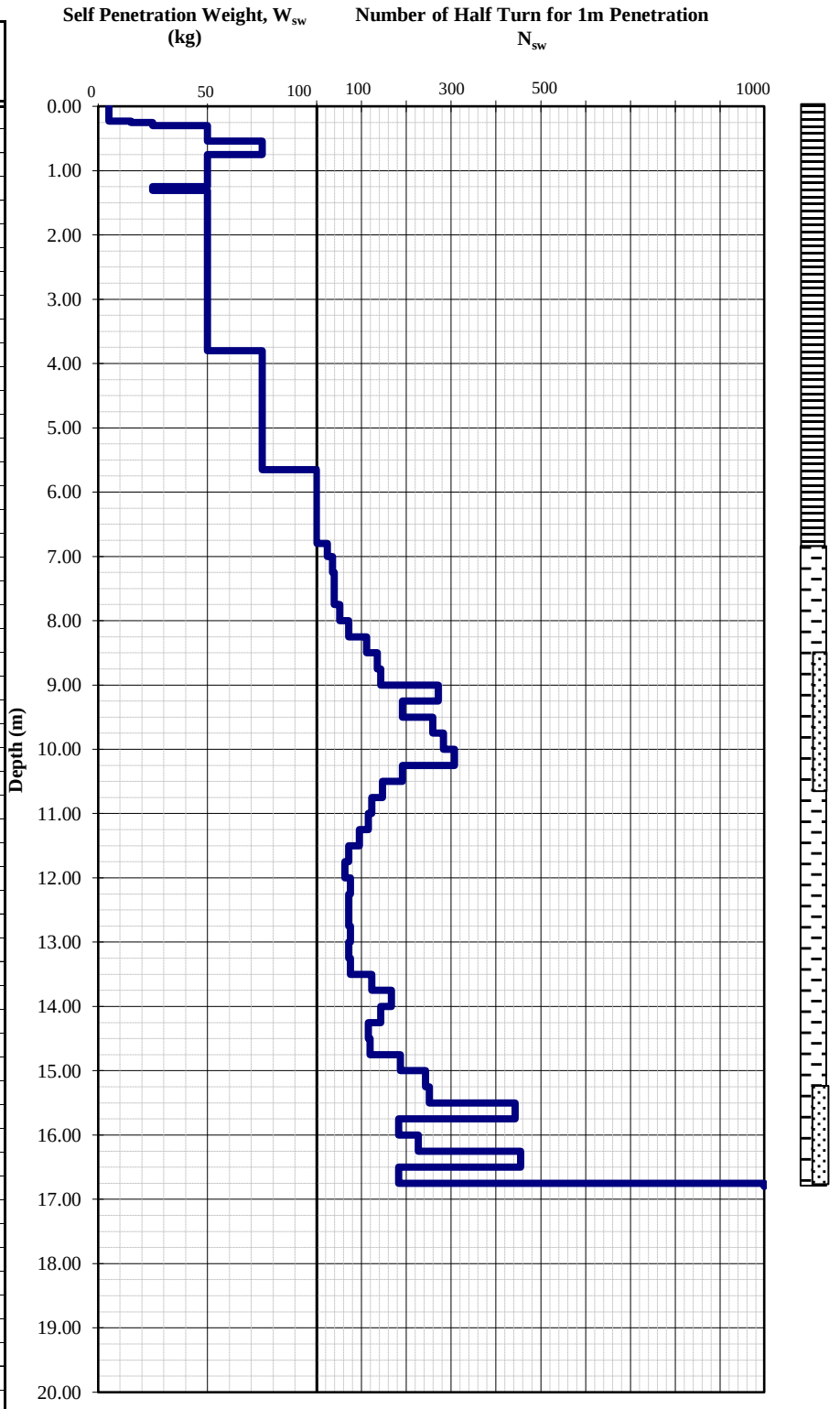


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-20-13
Location : N :2400361.98 E :384642.32
Ground Level : +0.82mMSL

Tested Date : 9-Oct-14
Performed by : Tomohiro Sadamoto
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.23	5	N.A.	23	N.A.
0.23 - 0.25	15	N.A.	2	N.A.
0.25 - 0.30	25	N.A.	5	N.A.
0.30 - 0.54	50	N.A.	24	N.A.
0.54 - 0.75	75	N.A.	21	N.A.
0.75 - 1.25	50	N.A.	50	N.A.
1.25 - 1.31	25	N.A.	6	N.A.
1.31 - 1.75	50	N.A.	44	N.A.
1.75 - 2.25	50	N.A.	50	N.A.
2.25 - 2.75	50	N.A.	50	N.A.
2.75 - 3.25	50	N.A.	50	N.A.
3.25 - 3.75	50	N.A.	50	N.A.
3.75 - 3.80	50	N.A.	5	N.A.
3.80 - 4.25	75	N.A.	45	N.A.
4.25 - 4.75	75	N.A.	50	N.A.
4.75 - 5.25	75	N.A.	50	N.A.
5.25 - 5.65	75	N.A.	40	N.A.
5.65 - 5.75	100	N.A.	10	N.A.
5.75 - 6.25	100	N.A.	50	N.A.
6.25 - 6.75	100	N.A.	50	N.A.
6.75 - 6.80	100	N.A.	5	N.A.
6.80 - 7.00	100	5	20	25
7.00 - 7.25	100	9	25	36
7.25 - 7.50	100	10	25	40
7.50 - 7.75	100	10	25	40
7.75 - 8.00	100	13	25	52
8.00 - 8.25	100	18	25	72
8.25 - 8.50	100	28	25	112
8.50 - 8.75	100	34	25	136
8.75 - 9.00	100	36	25	144
9.00 - 9.25	100	68	25	272
9.25 - 9.50	100	48	25	192
9.50 - 9.75	100	65	25	260
9.75 - 10.00	100	71	25	284
10.00 - 10.25	100	77	25	308
10.25 - 10.50	100	48	25	192
10.50 - 10.75	100	37	25	148
10.75 - 11.00	100	31	25	124
11.00 - 11.25	100	29	25	116
11.25 - 11.50	100	24	25	96
11.50 - 11.75	100	18	25	72
11.75 - 12.00	100	16	25	64
12.00 - 12.25	100	19	25	76
12.25 - 12.50	100	18	25	72
12.50 - 12.75	100	18	25	72
12.75 - 13.00	100	19	25	76
13.00 - 13.25	100	18	25	72
13.25 - 13.50	100	19	25	76
13.50 - 13.75	100	31	25	124
13.75 - 14.00	100	42	25	168
14.00 - 14.25	100	36	25	144
14.25 - 14.50	100	29	25	116
14.50 - 14.75	100	30	25	120
14.75 - 15.00	100	47	25	188
15.00 - 15.25	100	61	25	244
15.25 - 15.50	100	63	25	252
15.50 - 15.75	100	111	25	444
15.75 - 16.00	100	46	25	184
16.00 - 16.25	100	57	25	228
16.25 - 16.50	100	114	25	456
16.50 - 16.75	100	46	25	184
16.75 - 16.80	100	50	5	1000
-				
-				

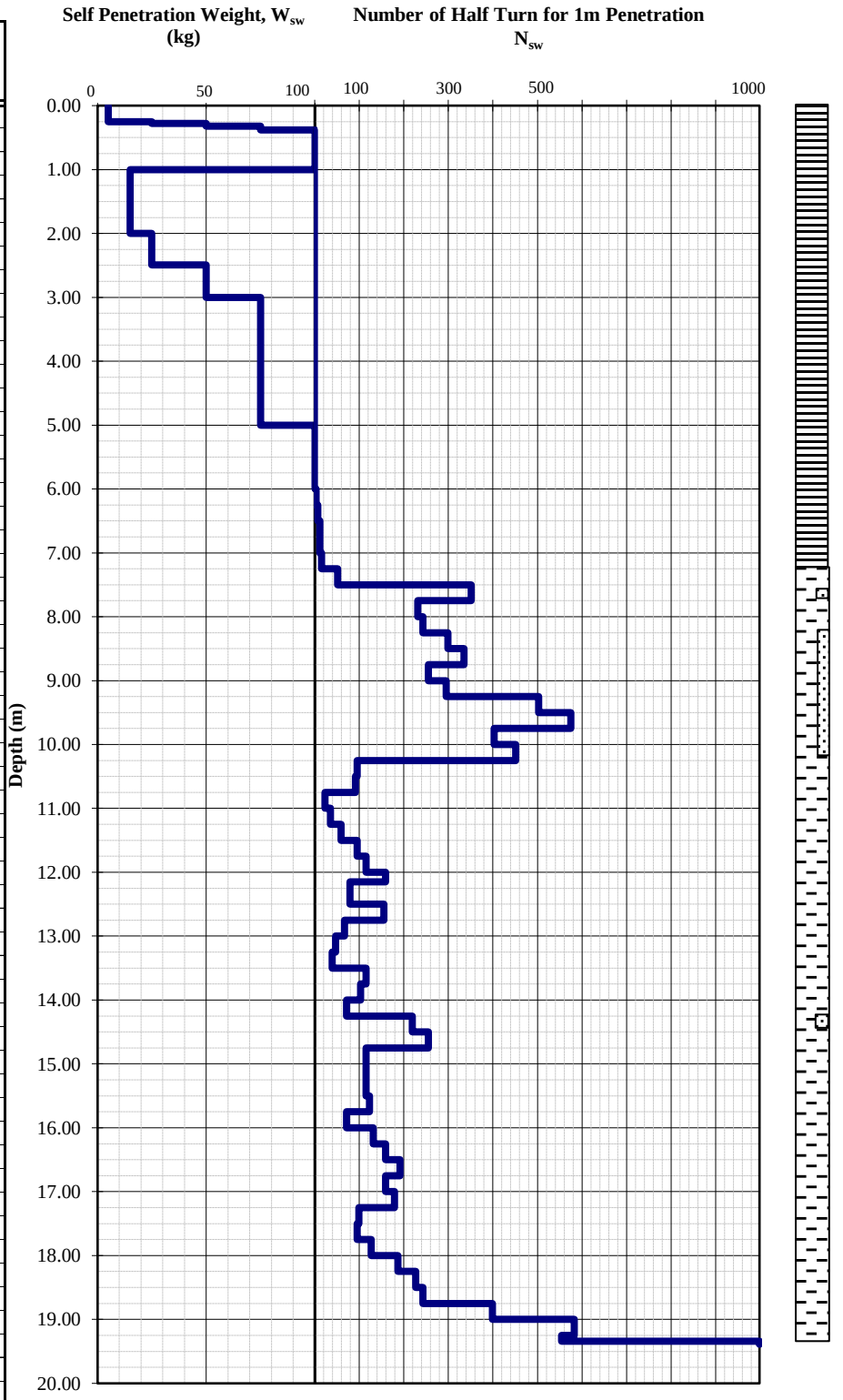


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-20-14
Location : N : 2400120.58 E : 384622.92
Ground Level : +0.96mMSL

Tested Date : 2014/9/18～9/19
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.25	5	N.A.	25	N.A.
0.25 - 0.25	15	N.A.	0	N.A.
0.25 - 0.28	25	N.A.	3	N.A.
0.28 - 0.32	50	N.A.	4	N.A.
0.32 - 0.38	75	N.A.	6	N.A.
0.38 - 1.00	100	N.A.	62	N.A.
1.00 - 1.35	15	N.A.	35	N.A.
1.35 - 2.00	15	N.A.	65	N.A.
2.00 - 2.49	25	N.A.	49	N.A.
2.49 - 3.00	50	N.A.	51	N.A.
3.00 - 5.00	75	N.A.	200	N.A.
5.00 - 6.00	100	N.A.	100	N.A.
6.00 - 6.25	100	1	25	4
6.25 - 6.50	100	2	25	8
6.50 - 6.75	100	3	25	12
6.75 - 7.00	100	3	25	12
7.00 - 7.25	100	4	25	16
7.25 - 7.50	100	13	25	52
7.50 - 7.75	100	88	25	352
7.75 - 8.00	100	58	25	232
8.00 - 8.25	100	61	25	244
8.25 - 8.50	100	75	25	300
8.50 - 8.75	100	84	25	336
8.75 - 9.00	100	64	25	256
9.00 - 9.25	100	74	25	296
9.25 - 9.50	100	126	25	504
9.50 - 9.75	100	144	25	576
9.75 - 10.00	100	101	25	404
10.00 - 10.25	100	113	25	452
10.25 - 10.50	100	24	25	96
10.50 - 10.75	100	23	25	92
10.75 - 11.00	100	6	25	24
11.00 - 11.25	100	9	25	36
11.25 - 11.50	100	15	25	60
11.50 - 11.75	100	24	25	96
11.75 - 12.00	100	29	25	116
12.00 - 12.15	100	24	15	160
12.15 - 12.50	100	28	35	80
12.50 - 12.75	100	39	25	156
12.75 - 13.00	100	17	25	68
13.00 - 13.25	100	12	25	48
13.25 - 13.50	100	10	25	40
13.50 - 13.75	100	29	25	116
13.75 - 14.00	100	26	25	104
14.00 - 14.25	100	18	25	72
14.25 - 14.50	100	55	25	220
14.50 - 14.75	100	64	25	256
14.75 - 15.00	100	29	25	116
15.00 - 15.25	100	29	25	116
15.25 - 15.50	100	29	25	116
15.50 - 15.75	100	31	25	124
15.75 - 16.00	100	18	25	72
16.00 - 16.25	100	33	25	132
16.25 - 16.50	100	40	25	160
16.50 - 16.75	100	48	25	192
16.75 - 17.00	100	40	25	160
17.00 - 17.25	100	45	25	180
17.25 - 17.50	100	25	25	100
17.50 - 17.75	100	24	25	96
17.75 - 18.00	100	32	25	128
18.00 - 18.25	100	47	25	188
18.25 - 18.50	100	57	25	228
18.50 - 18.75	100	61	25	244
18.75 - 19.00	100	100	25	400
19.00 - 19.25	100	146	25	584
19.25 - 19.34	100	50	9	556
19.34 - 19.39	100	50	5	1000

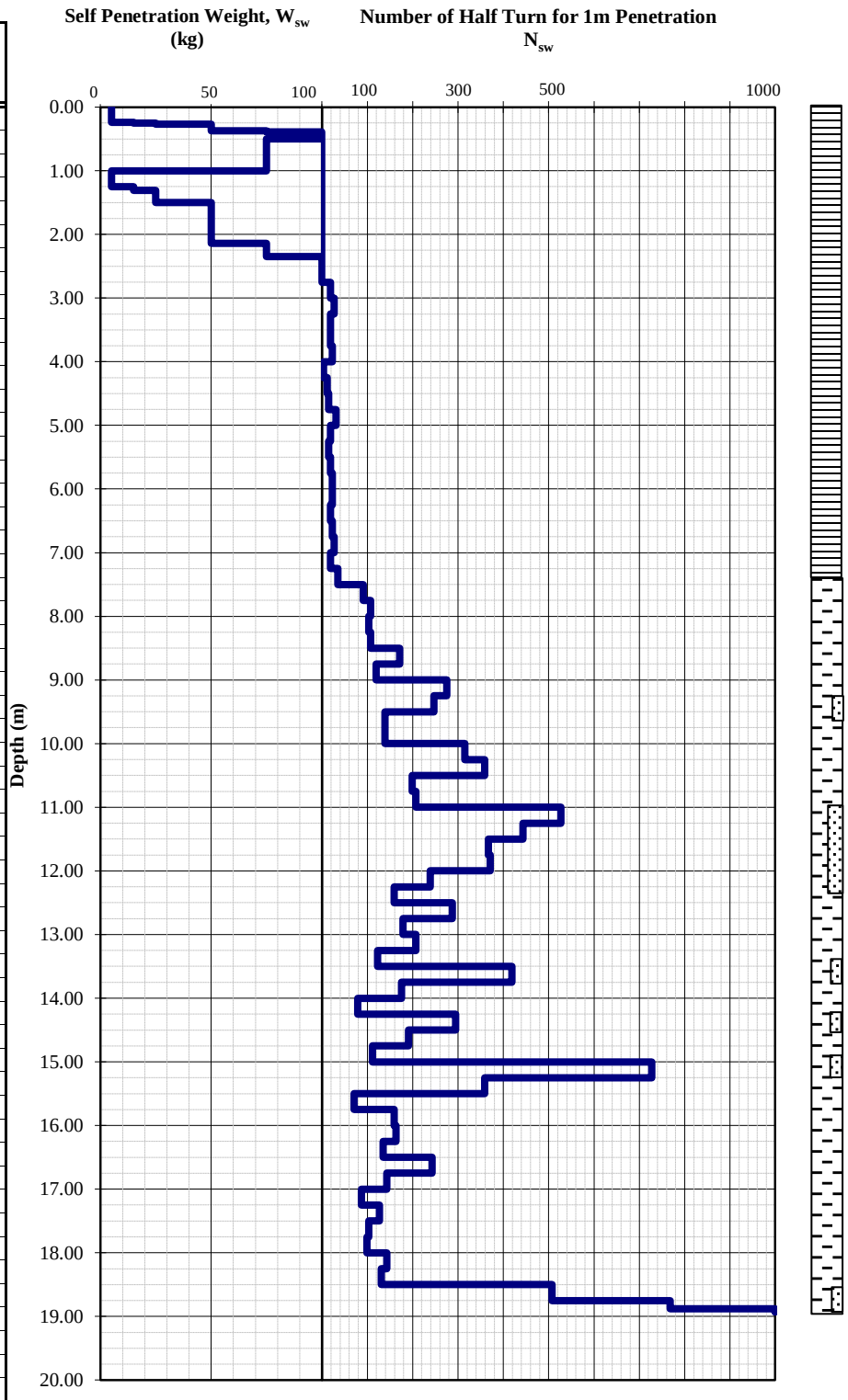


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-20-15
Location : N : 2399921.60 E :384641.54
Ground Level : +0.98mMSL

Tested Date : 10-Oct-14
Performed by : Tomohiro Sadamoto
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.24	5	N.A.	24	N.A.
0.24 - 0.25	15	N.A.	1	N.A.
0.25 - 0.27	25	N.A.	2	N.A.
0.27 - 0.37	50	N.A.	10	N.A.
0.37 - 0.39	75	N.A.	2	N.A.
0.39 - 0.50	100	N.A.	11	N.A.
0.50 - 1.00	75	N.A.	50	N.A.
1.00 - 1.25	5	N.A.	25	N.A.
1.25 - 1.31	15	N.A.	6	N.A.
1.31 - 1.50	25	N.A.	19	N.A.
1.50 - 1.93	50	N.A.	43	N.A.
1.93 - 2.00	50	N.A.	7	N.A.
2.00 - 2.14	50	N.A.	14	N.A.
2.14 - 2.35	75	N.A.	21	N.A.
2.35 - 2.50	100	N.A.	15	N.A.
2.50 - 2.75	100	N.A.	25	N.A.
2.75 - 3.00	100	5	25	20
3.00 - 3.25	100	7	25	28
3.25 - 3.50	100	5	25	20
3.50 - 3.75	100	5	25	20
3.75 - 4.00	100	6	25	24
4.00 - 4.25	100	1	25	4
4.25 - 4.50	100	3	25	12
4.50 - 4.75	100	4	25	16
4.75 - 5.00	100	8	25	32
5.00 - 5.25	100	5	25	20
5.25 - 5.50	100	4	25	16
5.50 - 5.75	100	5	25	20
5.75 - 6.00	100	6	25	24
6.00 - 6.25	100	6	25	24
6.25 - 6.50	100	5	25	20
6.50 - 6.75	100	6	25	24
6.75 - 7.00	100	7	25	28
7.00 - 7.25	100	5	25	20
7.25 - 7.50	100	9	25	36
7.50 - 7.75	100	23	25	92
7.75 - 8.00	100	27	25	108
8.00 - 8.25	100	26	25	104
8.25 - 8.50	100	27	25	108
8.50 - 8.75	100	43	25	172
8.75 - 9.00	100	30	25	120
9.00 - 9.25	100	69	25	276
9.25 - 9.50	100	62	25	248
9.50 - 9.75	100	35	25	140
9.75 - 10.00	100	35	25	140
10.00 - 10.25	100	79	25	316
10.25 - 10.50	100	90	25	360
10.50 - 10.75	100	50	25	200
10.75 - 11.00	100	52	25	208
11.00 - 11.25	100	132	25	528
11.25 - 11.50	100	111	25	444
11.50 - 11.75	100	92	25	368
11.75 - 12.00	100	93	25	372
12.00 - 12.25	100	60	25	240
12.25 - 12.50	100	40	25	160
12.50 - 12.75	100	72	25	288
12.75 - 13.00	100	45	25	180
13.00 - 13.25	100	52	25	208
13.25 - 13.50	100	31	25	124
13.50 - 13.75	100	105	25	420
13.75 - 14.00	100	44	25	176
14.00 - 14.25	100	20	25	80
14.25 - 14.50	100	74	25	296
14.50 - 14.75	100	48	25	192
14.75 - 15.00	100	28	25	112
15.00 - 15.25	100	182	25	728
15.25 - 15.50	100	90	25	360
15.50 - 15.75	100	18	25	72
15.75 - 16.00	100	40	25	160
16.00 - 16.25	100	41	25	164
16.25 - 16.50	100	34	25	136
16.50 - 16.75	100	61	25	244
16.75 - 17.00	100	36	25	144
17.00 - 17.25	100	22	25	88
17.25 - 17.50	100	32	25	128
17.50 - 17.75	100	26	25	104
17.75 - 18.00	100	25	25	100
18.00 - 18.25	100	36	25	144
18.25 - 18.50	100	33	25	132
18.50 - 18.75	100	127	25	508
18.75 - 18.88	100	100	13	769
18.88 - 18.93	100	50	5	1000

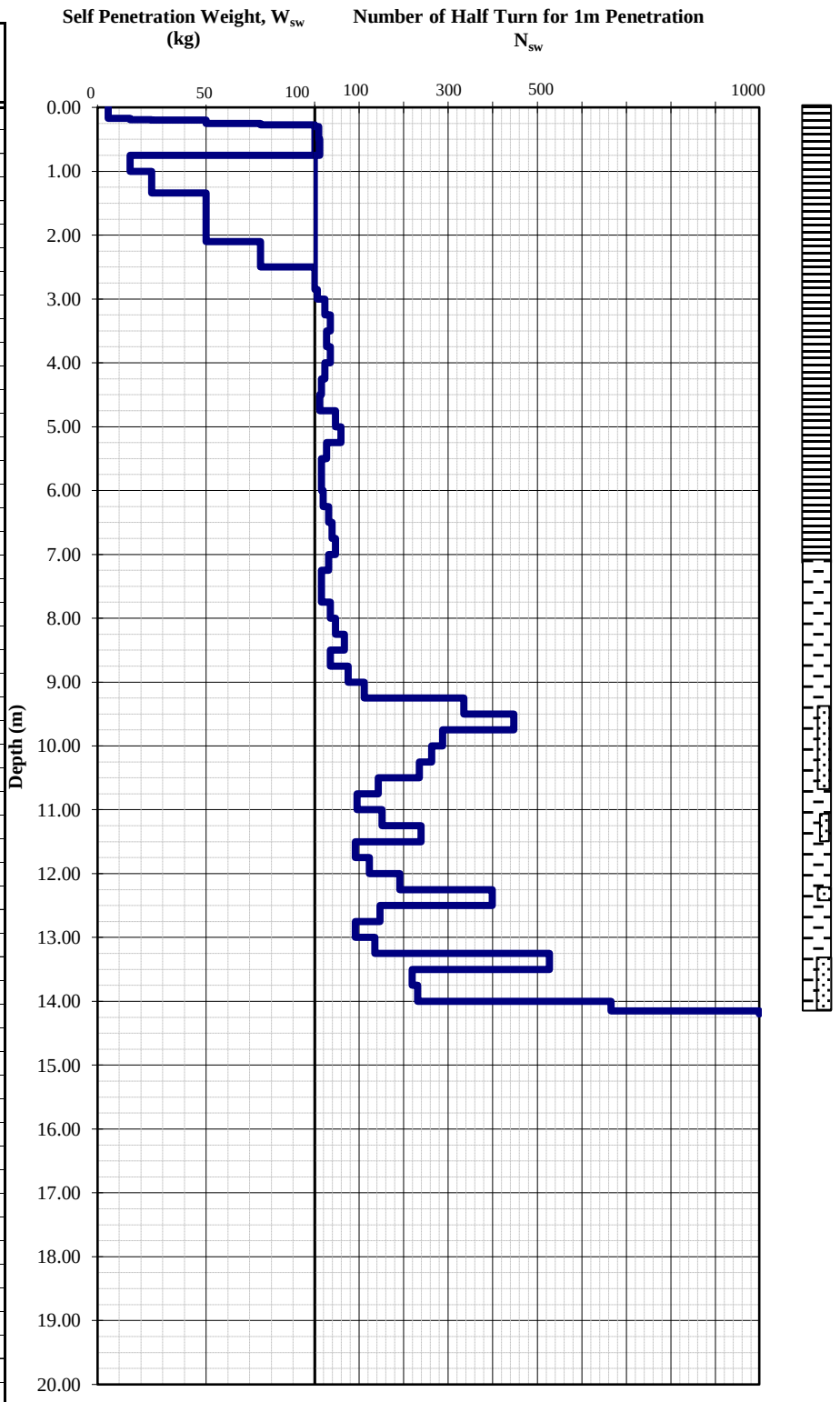


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-20-17
Location : N : 2399679.97 E :384641.96
Ground Level : +0.97mMSL

Tested Date : 11-Oct-14
Performed by : Tomohiro Sadamoto
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.17	5	N.A.	17	N.A.
0.17 - 0.19	15	N.A.	2	N.A.
0.19 - 0.20	25	N.A.	1	N.A.
0.20 - 0.25	50	N.A.	5	N.A.
0.25 - 0.27	75	N.A.	2	N.A.
0.27 - 0.30	100	N.A.	3	N.A.
0.30 - 0.50	100	2	20	10
0.50 - 0.75	100	3	25	12
0.75 - 0.75	100	N.A.	0	N.A.
0.75 - 1.00	15	N.A.	25	N.A.
1.00 - 1.34	25	N.A.	34	N.A.
1.34 - 1.50	50	N.A.	16	N.A.
1.50 - 2.00	50	N.A.	50	N.A.
2.00 - 2.10	50	N.A.	10	N.A.
2.10 - 2.50	75	N.A.	40	N.A.
2.50 - 2.85	100	N.A.	35	N.A.
2.85 - 3.00	100	1	15	7
3.00 - 3.25	100	6	25	24
3.25 - 3.50	100	9	25	36
3.50 - 3.75	100	7	25	28
3.75 - 4.00	100	9	25	36
4.00 - 4.25	100	6	25	24
4.25 - 4.50	100	4	25	16
4.50 - 4.75	100	3	25	12
4.75 - 5.00	100	12	25	48
5.00 - 5.25	100	15	25	60
5.25 - 5.50	100	7	25	28
5.50 - 5.75	100	4	25	16
5.75 - 6.00	100	4	25	16
6.00 - 6.25	100	5	25	20
6.25 - 6.50	100	8	25	32
6.50 - 6.75	100	10	25	40
6.75 - 7.00	100	12	25	48
7.00 - 7.25	100	8	25	32
7.25 - 7.50	100	4	25	16
7.50 - 7.75	100	4	25	16
7.75 - 8.00	100	9	25	36
8.00 - 8.25	100	12	25	48
8.25 - 8.50	100	17	25	68
8.50 - 8.75	100	9	25	36
8.75 - 9.00	100	19	25	76
9.00 - 9.25	100	28	25	112
9.25 - 9.50	100	84	25	336
9.50 - 9.75	100	112	25	448
9.75 - 10.00	100	72	25	288
10.00 - 10.25	100	66	25	264
10.25 - 10.50	100	59	25	236
10.50 - 10.75	100	36	25	144
10.75 - 11.00	100	24	25	96
11.00 - 11.25	100	38	25	152
11.25 - 11.50	100	60	25	240
11.50 - 11.75	100	23	25	92
11.75 - 12.00	100	31	25	124
12.00 - 12.25	100	48	25	192
12.25 - 12.50	100	100	25	400
12.50 - 12.75	100	37	25	148
12.75 - 13.00	100	23	25	92
13.00 - 13.25	100	34	25	136
13.25 - 13.50	100	132	25	528
13.50 - 13.75	100	55	25	220
13.75 - 14.00	100	58	25	232
14.00 - 14.15	100	100	15	667
14.15 - 14.20	100	50	5	1000
-				
-				

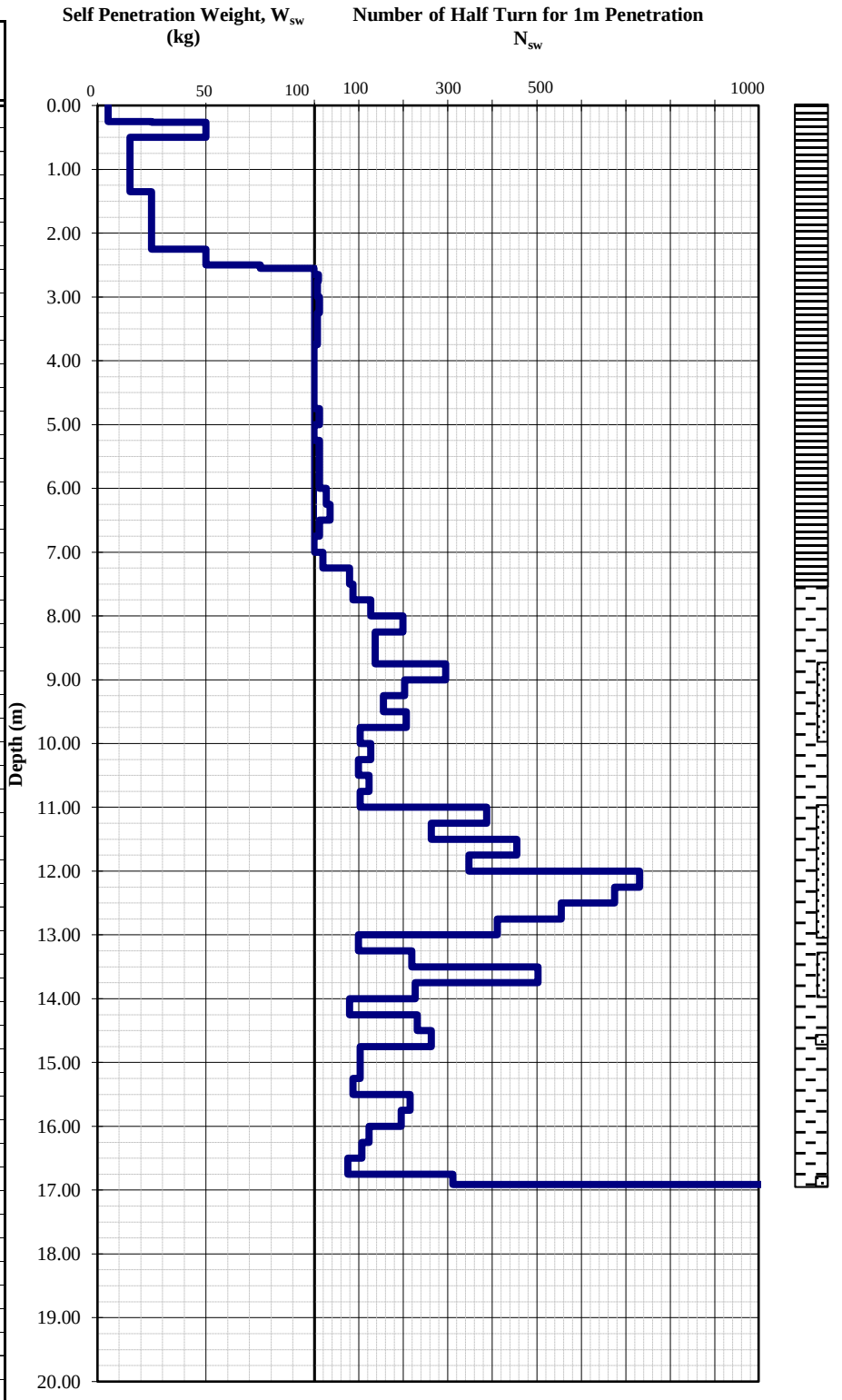


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-21-14
Location : N : 2400119.98 E : 384791.12
Ground Level : +0.79mMSL

Tested Date : 2014/9/17～9/18
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.25	5	N.A.	25	N.A.
0.25 - 0.25	15	N.A.	0	N.A.
0.25 - 0.26	25	N.A.	1	N.A.
0.26 - 0.50	50	N.A.	24	N.A.
0.50 - 1.35	15	N.A.	85	N.A.
1.35 - 2.25	25	N.A.	90	N.A.
2.25 - 2.50	50	N.A.	25	N.A.
2.50 - 2.55	75	N.A.	5	N.A.
2.55 - 2.65	100	N.A.	10	N.A.
2.65 - 2.75	100	1	10	10
2.75 - 3.00	100	2	25	8
3.00 - 3.25	100	3	25	12
3.25 - 3.50	100	2	25	8
3.50 - 3.75	100	2	25	8
3.75 - 4.75	100	N.A.	100	N.A.
4.75 - 5.00	100	3	25	12
5.00 - 5.25	100	N.A.	25	N.A.
5.25 - 5.50	100	3	25	12
5.50 - 5.75	100	3	25	12
5.75 - 6.00	100	3	25	12
6.00 - 6.25	100	7	25	28
6.25 - 6.50	100	9	25	36
6.50 - 6.75	100	3	25	12
6.75 - 7.00	100	N.A.	25	N.A.
7.00 - 7.25	100	5	25	20
7.25 - 7.50	100	20	25	80
7.50 - 7.75	100	22	25	88
7.75 - 8.00	100	32	25	128
8.00 - 8.25	100	50	25	200
8.25 - 8.75	100	69	50	138
8.75 - 9.00	100	74	25	296
9.00 - 9.25	100	51	25	204
9.25 - 9.50	100	39	25	156
9.50 - 9.75	100	52	25	208
9.75 - 10.00	100	26	25	104
10.00 - 10.25	100	32	25	128
10.25 - 10.50	100	25	25	100
10.50 - 10.75	100	31	25	124
10.75 - 11.00	100	26	25	104
11.00 - 11.25	100	97	25	388
11.25 - 11.50	100	66	25	264
11.50 - 11.75	100	114	25	456
11.75 - 12.00	100	87	25	348
12.00 - 12.25	100	183	25	732
12.25 - 12.50	100	169	25	676
12.50 - 12.75	100	139	25	556
12.75 - 13.00	100	103	25	412
13.00 - 13.25	100	25	25	100
13.25 - 13.50	100	55	25	220
13.50 - 13.75	100	126	25	504
13.75 - 14.00	100	57	25	228
14.00 - 14.25	100	20	25	80
14.25 - 14.50	100	58	25	232
14.50 - 14.75	100	66	25	264
14.75 - 15.00	100	26	25	104
15.00 - 15.25	100	26	25	104
15.25 - 15.50	100	22	25	88
15.50 - 15.75	100	54	25	216
15.75 - 16.00	100	49	25	196
16.00 - 16.25	100	31	25	124
16.25 - 16.50	100	27	25	108
16.50 - 16.75	100	19	25	76
16.75 - 16.91	100	50	16	313
16.91 - 16.95	100	50	4	1250

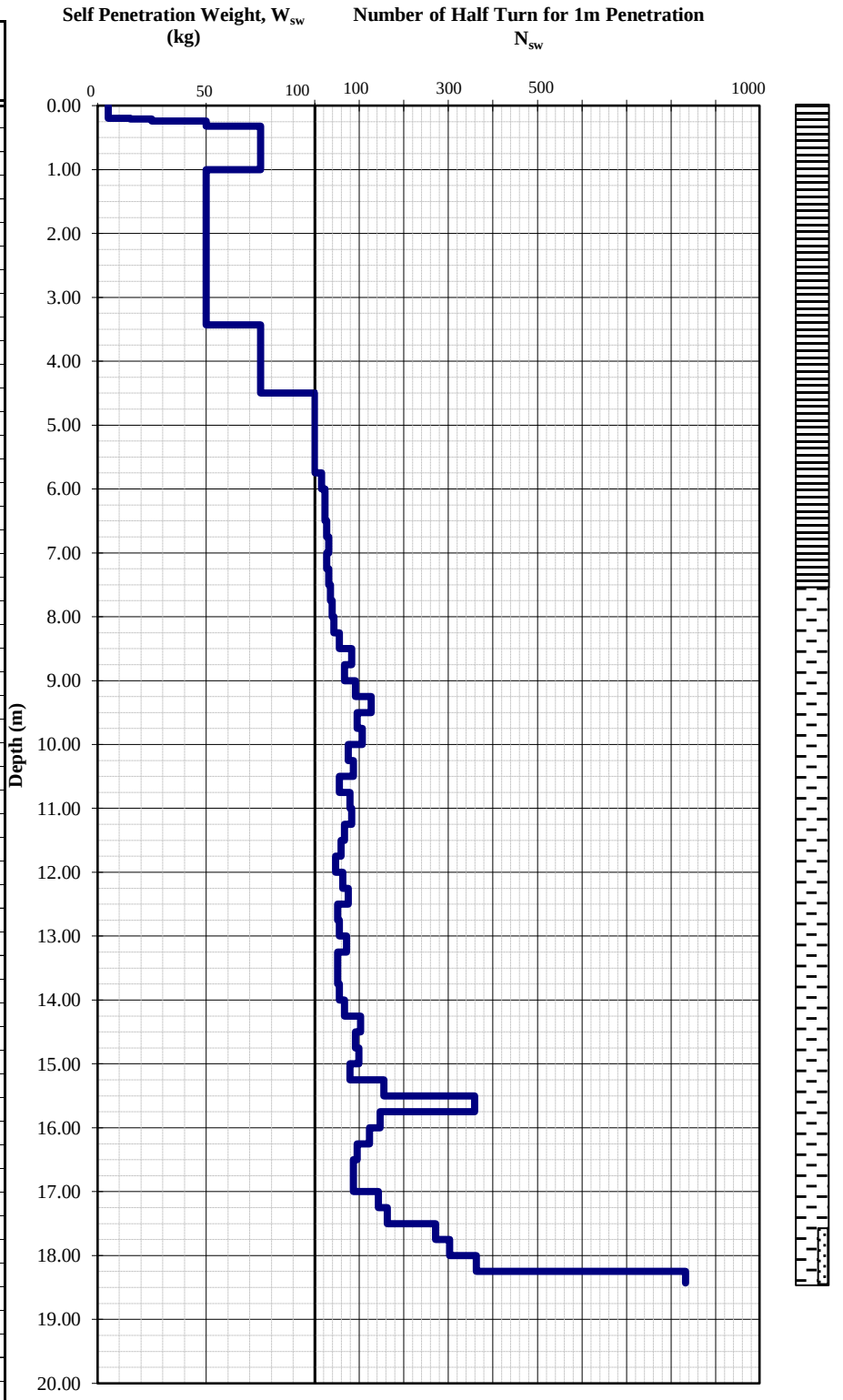


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-22-11
Location : N : 2400723.40 E : 384942.53
Ground Level : +0.92mMSL

Tested Date : 15-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.20	5	N.A.	20	N.A.
0.20 - 0.21	15	N.A.	1	N.A.
0.21 - 0.24	25	N.A.	3	N.A.
0.24 - 0.32	50	N.A.	8	N.A.
0.32 - 1.00	75	N.A.	68	N.A.
1.00 - 3.43	50	N.A.	243	N.A.
3.43 - 4.50	75	N.A.	107	N.A.
4.50 - 5.75	100	N.A.	125	N.A.
5.75 - 6.00	100	4	25	16
6.00 - 6.25	100	6	25	24
6.25 - 6.50	100	6	25	24
6.50 - 6.75	100	7	25	28
6.75 - 7.00	100	8	25	32
7.00 - 7.25	100	7	25	28
7.25 - 7.50	100	8	25	32
7.50 - 7.75	100	9	25	36
7.75 - 8.00	100	10	25	40
8.00 - 8.25	100	11	25	44
8.25 - 8.50	100	14	25	56
8.50 - 8.75	100	21	25	84
8.75 - 9.00	100	17	25	68
9.00 - 9.25	100	23	25	92
9.25 - 9.50	100	32	25	128
9.50 - 9.75	100	24	25	96
9.75 - 10.00	100	27	25	108
10.00 - 10.25	100	19	25	76
10.25 - 10.50	100	22	25	88
10.50 - 10.75	100	14	25	56
10.75 - 11.00	100	20	25	80
11.00 - 11.25	100	21	25	84
11.25 - 11.50	100	17	25	68
11.50 - 11.75	100	15	25	60
11.75 - 12.00	100	12	25	48
12.00 - 12.25	100	16	25	64
12.25 - 12.50	100	19	25	76
12.50 - 12.75	100	13	25	52
12.75 - 13.00	100	14	25	56
13.00 - 13.25	100	18	25	72
13.25 - 13.50	100	13	25	52
13.50 - 13.75	100	13	25	52
13.75 - 14.00	100	14	25	56
14.00 - 14.25	100	17	25	68
14.25 - 14.50	100	26	25	104
14.50 - 14.75	100	23	25	92
14.75 - 15.00	100	25	25	100
15.00 - 15.25	100	20	25	80
15.25 - 15.50	100	39	25	156
15.50 - 15.75	100	90	25	360
15.75 - 16.00	100	37	25	148
16.00 - 16.25	100	31	25	124
16.25 - 16.50	100	24	25	96
16.50 - 16.75	100	22	25	88
16.75 - 17.00	100	22	25	88
17.00 - 17.25	100	36	25	144
17.25 - 17.50	100	41	25	164
17.50 - 17.75	100	68	25	272
17.75 - 18.00	100	76	25	304
18.00 - 18.25	100	91	25	364
18.25 - 18.43	100	150	18	833
-				
-				
-				
-				
-				

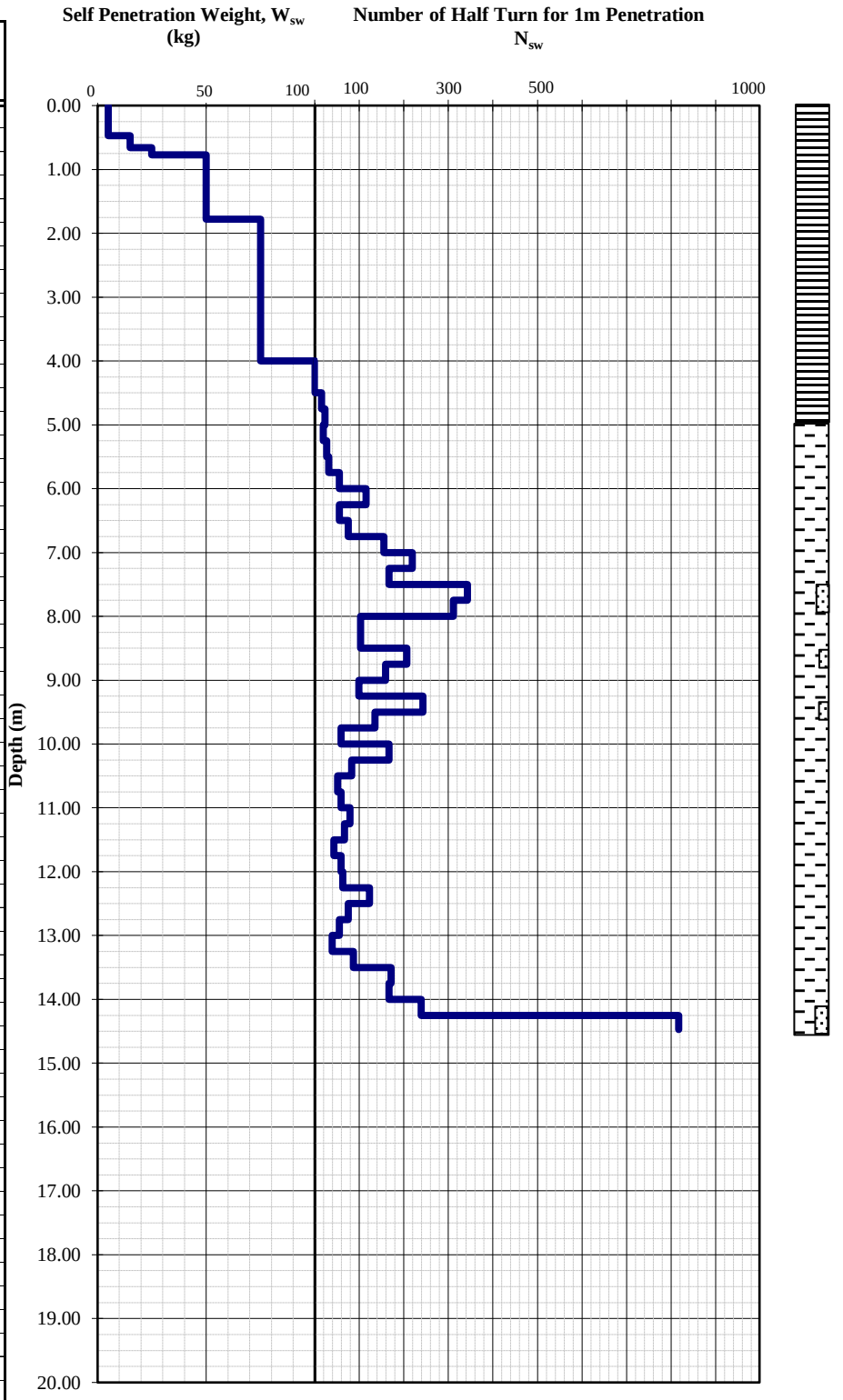


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-22-12
Location : N : 2400522.42 E : 384938.19
Ground Level : +0.00mMSL

Tested Date : 15-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.47	5	N.A.	47	N.A.
0.47 - 0.66	15	N.A.	19	N.A.
0.66 - 0.77	25	N.A.	11	N.A.
0.77 - 1.78	50	N.A.	101	N.A.
1.78 - 4.00	75	N.A.	222	N.A.
4.00 - 4.50	100	N.A.	50	N.A.
4.50 - 4.75	100	4	25	16
4.75 - 5.00	100	6	25	24
5.00 - 5.25	100	5	25	20
5.25 - 5.50	100	7	25	28
5.50 - 5.75	100	8	25	32
5.75 - 6.00	100	14	25	56
6.00 - 6.25	100	29	25	116
6.25 - 6.50	100	14	25	56
6.50 - 6.75	100	19	25	76
6.75 - 7.00	100	39	25	156
7.00 - 7.25	100	55	25	220
7.25 - 7.50	100	42	25	168
7.50 - 7.75	100	86	25	344
7.75 - 8.00	100	78	25	312
8.00 - 8.25	100	26	25	104
8.25 - 8.50	100	26	25	104
8.50 - 8.75	100	52	25	208
8.75 - 9.00	100	40	25	160
9.00 - 9.25	100	25	25	100
9.25 - 9.50	100	61	25	244
9.50 - 9.75	100	34	25	136
9.75 - 10.00	100	15	25	60
10.00 - 10.25	100	42	25	168
10.25 - 10.50	100	21	25	84
10.50 - 10.75	100	13	25	52
10.75 - 11.00	100	15	25	60
11.00 - 11.25	100	20	25	80
11.25 - 11.50	100	17	25	68
11.50 - 11.75	100	11	25	44
11.75 - 12.00	100	15	25	60
12.00 - 12.25	100	16	25	64
12.25 - 12.50	100	31	25	124
12.50 - 12.75	100	19	25	76
12.75 - 13.00	100	14	25	56
13.00 - 13.25	100	10	25	40
13.25 - 13.50	100	22	25	88
13.50 - 13.75	100	43	25	172
13.75 - 14.00	100	42	25	168
14.00 - 14.25	100	60	25	240
14.25 - 14.47	100	180	22	818
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

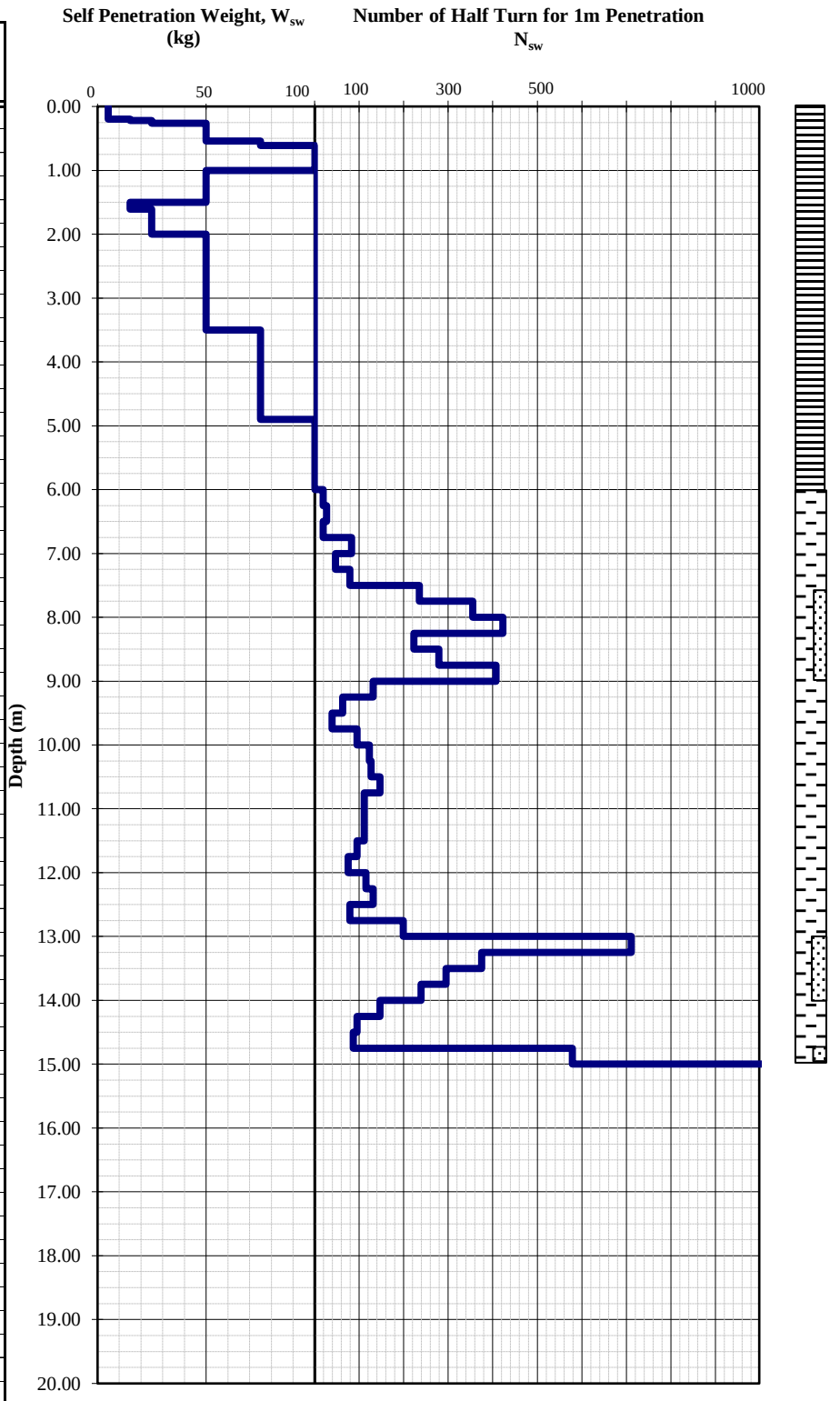


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-22-13
Location : N : 2400362.21 E : 384940.34
Ground Level : +0.73mMSL

Tested Date : 14-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.20	5	N.A.	20	N.A.
0.20 - 0.22	15	N.A.	2	N.A.
0.22 - 0.26	25	N.A.	4	N.A.
0.26 - 0.54	50	N.A.	28	N.A.
0.54 - 0.61	75	N.A.	7	N.A.
0.61 - 1.00	100	N.A.	39	N.A.
1.00 - 1.50	50	N.A.	50	N.A.
1.50 - 1.61	15	N.A.	11	N.A.
1.61 - 2.00	25	N.A.	39	N.A.
2.00 - 3.50	50	N.A.	150	N.A.
3.50 - 4.90	75	N.A.	140	N.A.
4.90 - 6.00	100	N.A.	110	N.A.
6.00 - 6.25	100	5	25	20
6.25 - 6.50	100	7	25	28
6.50 - 6.75	100	5	25	20
6.75 - 7.00	100	21	25	84
7.00 - 7.25	100	12	25	48
7.25 - 7.50	100	20	25	80
7.50 - 7.75	100	59	25	236
7.75 - 8.00	100	89	25	356
8.00 - 8.25	100	106	25	424
8.25 - 8.50	100	56	25	224
8.50 - 8.75	100	70	25	280
8.75 - 9.00	100	102	25	408
9.00 - 9.25	100	33	25	132
9.25 - 9.50	100	16	25	64
9.50 - 9.75	100	10	25	40
9.75 - 10.00	100	24	25	96
10.00 - 10.25	100	31	25	124
10.25 - 10.50	100	32	25	128
10.50 - 10.75	100	37	25	148
10.75 - 11.00	100	28	25	112
11.00 - 11.25	100	28	25	112
11.25 - 11.50	100	28	25	112
11.50 - 11.75	100	24	25	96
11.75 - 12.00	100	19	25	76
12.00 - 12.25	100	29	25	116
12.25 - 12.50	100	33	25	132
12.50 - 12.75	100	20	25	80
12.75 - 13.00	100	50	25	200
13.00 - 13.25	100	178	25	712
13.25 - 13.50	100	94	25	376
13.50 - 13.75	100	74	25	296
13.75 - 14.00	100	60	25	240
14.00 - 14.25	100	37	25	148
14.25 - 14.50	100	24	25	96
14.50 - 14.75	100	22	25	88
14.75 - 15.00	100	145	25	580
15.00 - 15.03	100	50	3	1667
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

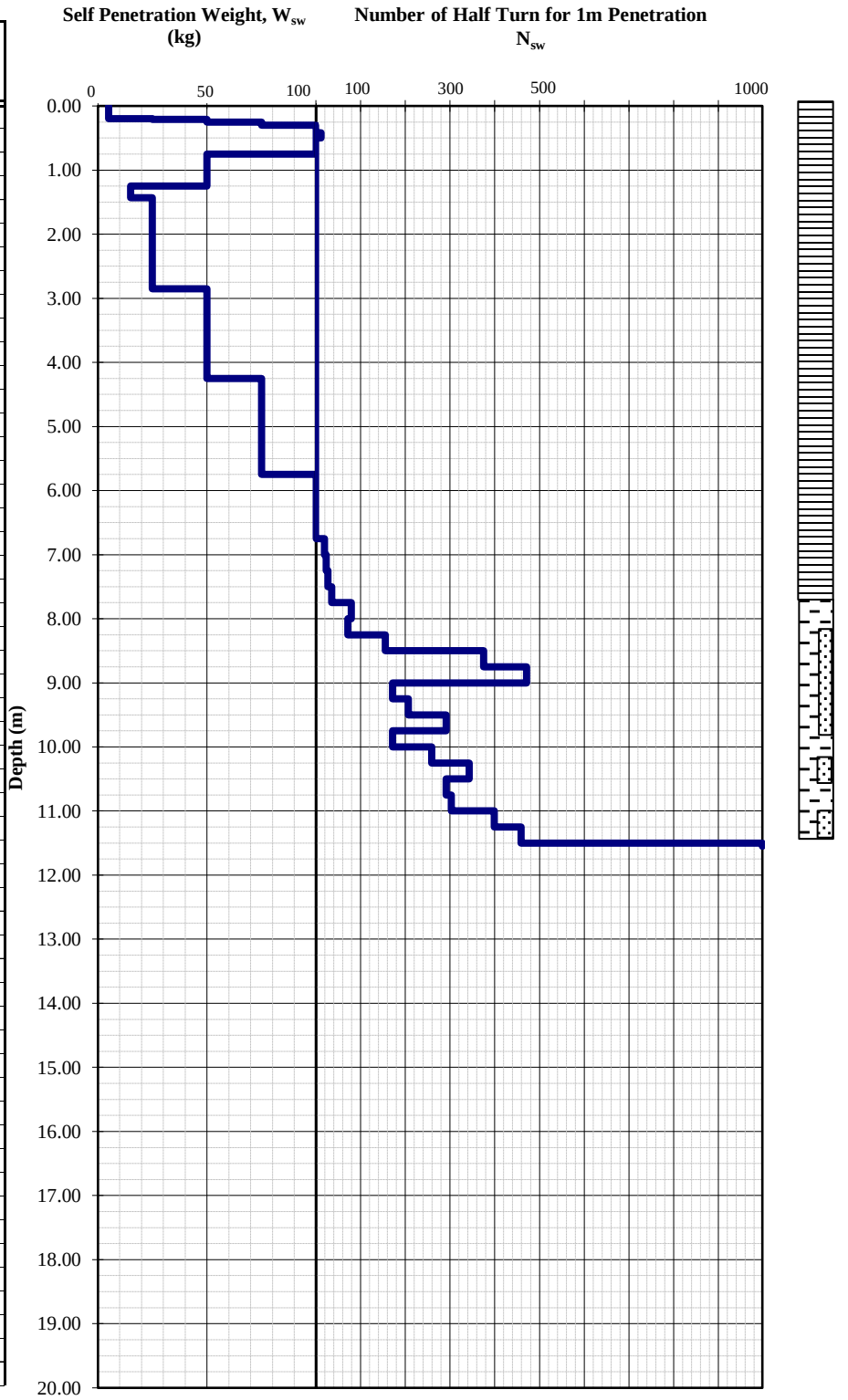


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-22-15
Location : N : 2399923.67 E :384940.92
Ground Level : +0.67mMSL

Tested Date : 17-Sep-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.20	5	N.A.	20	N.A.
0.20 - 0.20	15	N.A.	0	N.A.
0.20 - 0.21	25	N.A.	1	N.A.
0.21 - 0.25	50	N.A.	4	N.A.
0.25 - 0.30	75	N.A.	5	N.A.
0.30 - 0.42	100	N.A.	12	N.A.
0.42 - 0.50	100	1	8	13
0.50 - 0.75	100	N.A.	25	N.A.
0.75 - 1.25	50	N.A.	50	N.A.
1.25 - 1.43	15	N.A.	18	N.A.
1.43 - 2.85	25	N.A.	142	N.A.
2.85 - 4.25	50	N.A.	140	N.A.
4.25 - 5.75	75	N.A.	150	N.A.
5.75 - 6.75	100	N.A.	100	N.A.
6.75 - 7.00	100	5	25	20
7.00 - 7.25	100	6	25	24
7.25 - 7.50	100	7	25	28
7.50 - 7.75	100	9	25	36
7.75 - 8.00	100	20	25	80
8.00 - 8.25	100	18	25	72
8.25 - 8.50	100	39	25	156
8.50 - 8.75	100	94	25	376
8.75 - 9.00	100	118	25	472
9.00 - 9.25	100	43	25	172
9.25 - 9.50	100	52	25	208
9.50 - 9.75	100	73	25	292
9.75 - 10.00	100	43	25	172
10.00 - 10.25	100	65	25	260
10.25 - 10.50	100	86	25	344
10.50 - 10.75	100	73	25	292
10.75 - 11.00	100	76	25	304
11.00 - 11.25	100	100	25	400
11.25 - 11.50	100	115	25	460
11.50 - 11.55	100	50	5	1000
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

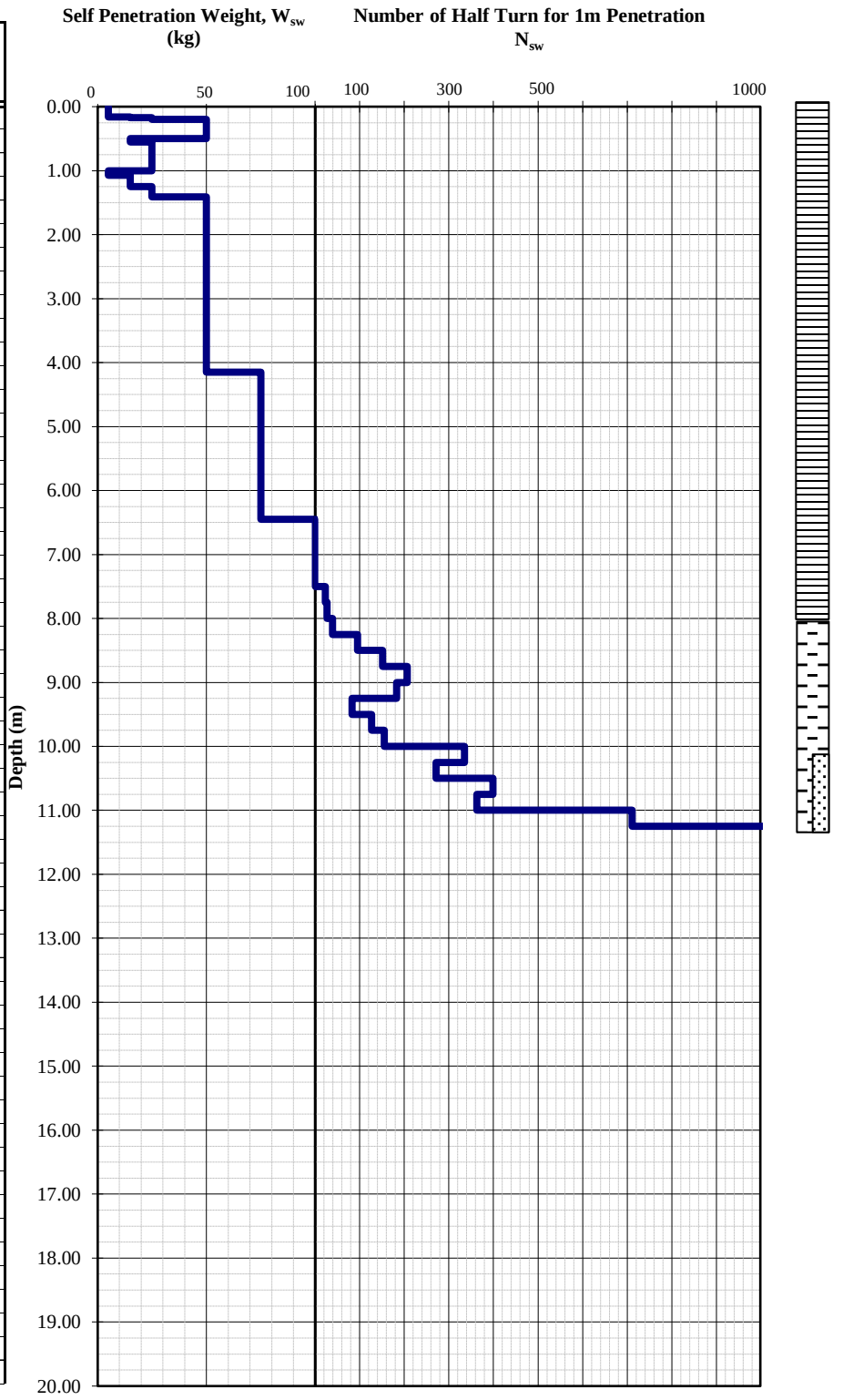


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-22-16
Location : N : 2399805.42 E :384943.27
Ground Level : +0.69mMSL

Tested Date : 16-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.16	5	N.A.	16	N.A.
0.16 - 0.17	15	N.A.	1	N.A.
0.17 - 0.20	25	N.A.	3	N.A.
0.20 - 0.50	50	N.A.	30	N.A.
0.50 - 0.55	15	N.A.	5	N.A.
0.55 - 1.00	25	N.A.	45	N.A.
1.00 - 1.07	5	N.A.	7	N.A.
1.07 - 1.25	15	N.A.	18	N.A.
1.25 - 1.41	25	N.A.	16	N.A.
1.41 - 4.15	50	N.A.	274	N.A.
4.15 - 6.45	75	N.A.	230	N.A.
6.45 - 7.50	100	N.A.	105	N.A.
7.50 - 7.75	100	6	25	24
7.75 - 8.00	100	7	25	28
8.00 - 8.25	100	10	25	40
8.25 - 8.50	100	24	25	96
8.50 - 8.75	100	38	25	152
8.75 - 9.00	100	52	25	208
9.00 - 9.25	100	46	25	184
9.25 - 9.50	100	21	25	84
9.50 - 9.75	100	32	25	128
9.75 - 10.00	100	39	25	156
10.00 - 10.25	100	84	25	336
10.25 - 10.50	100	68	25	272
10.50 - 10.75	100	100	25	400
10.75 - 11.00	100	91	25	364
11.00 - 11.25	100	178	25	712
11.25 - 11.29	100	50	4	1250
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				

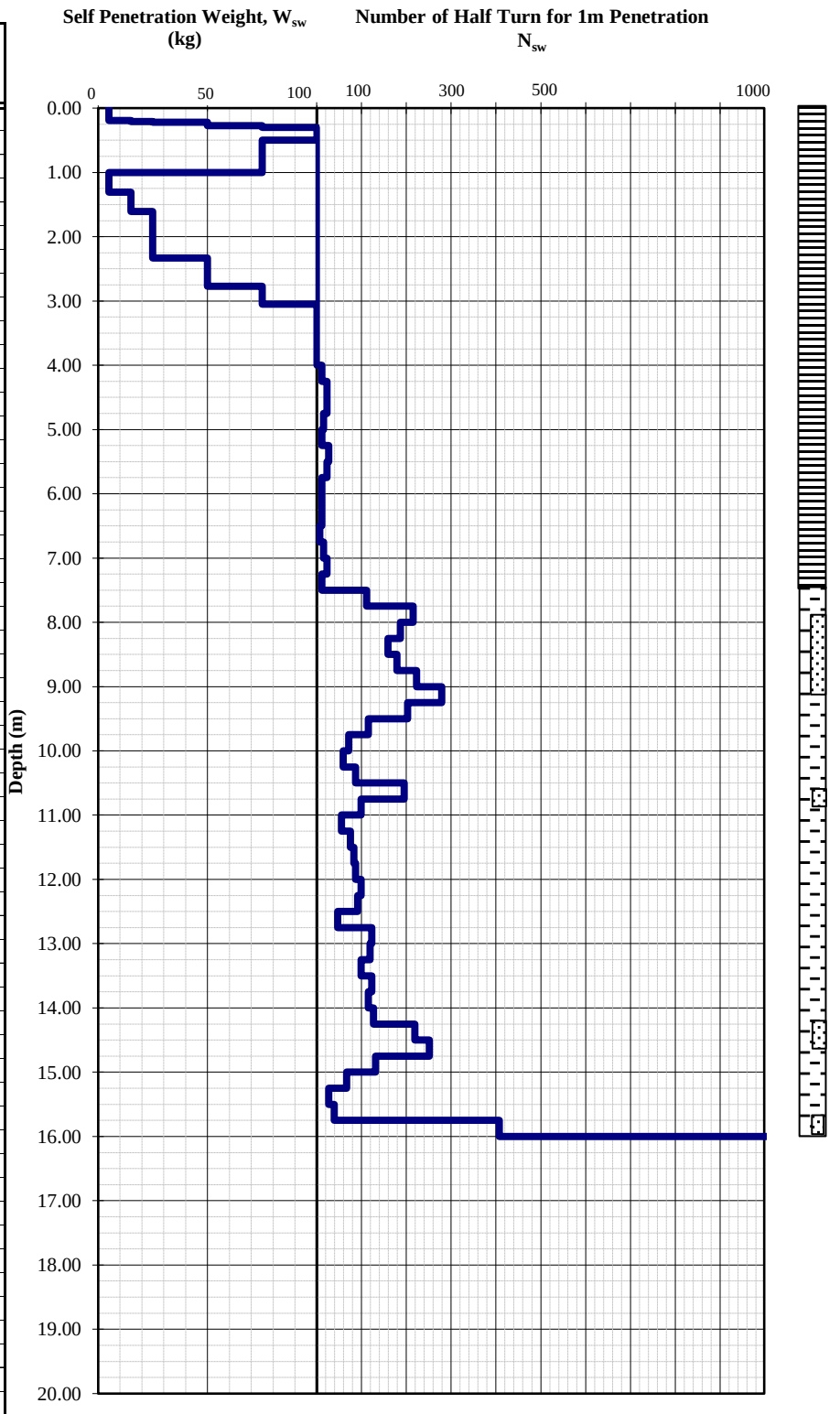


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-24-11
Location : N : 2400725.39 E :385290.26
Ground Level : +0.89mMSL

Tested Date : 14-Oct-14
Performed by : Kenji Teshima
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.19	5	N.A.	19	N.A.
0.19 - 0.21	15	N.A.	2	N.A.
0.21 - 0.22	25	N.A.	1	N.A.
0.22 - 0.27	50	N.A.	5	N.A.
0.27 - 0.30	75	N.A.	3	N.A.
0.30 - 0.50	100	N.A.	20	N.A.
0.50 - 1.00	75	N.A.	50	N.A.
1.00 - 1.31	5	N.A.	31	N.A.
1.31 - 1.61	15	N.A.	30	N.A.
1.61 - 2.33	25	N.A.	72	N.A.
2.33 - 2.77	50	N.A.	44	N.A.
2.77 - 3.05	75	N.A.	28	N.A.
3.05 - 4.00	100	N.A.	95	N.A.
4.00 - 4.25	100	3	25	12
4.25 - 4.50	100	6	25	24
4.50 - 4.75	100	6	25	24
4.75 - 5.00	100	4	25	16
5.00 - 5.25	100	3	25	12
5.25 - 5.50	100	7	25	28
5.50 - 5.75	100	6	25	24
5.75 - 6.00	100	3	25	12
6.00 - 6.25	100	3	25	12
6.25 - 6.50	100	3	25	12
6.50 - 6.75	100	2	25	8
6.75 - 7.00	100	4	25	16
7.00 - 7.25	100	6	25	24
7.25 - 7.50	100	3	25	12
7.50 - 7.75	100	28	25	112
7.75 - 8.00	100	54	25	216
8.00 - 8.25	100	47	25	188
8.25 - 8.50	100	40	25	160
8.50 - 8.75	100	45	25	180
8.75 - 9.00	100	56	25	224
9.00 - 9.25	100	70	25	280
9.25 - 9.50	100	51	25	204
9.50 - 9.75	100	29	25	116
9.75 - 10.00	100	18	25	72
10.00 - 10.25	100	15	25	60
10.25 - 10.50	100	22	25	88
10.50 - 10.75	100	49	25	196
10.75 - 11.00	100	25	25	100
11.00 - 11.25	100	14	25	56
11.25 - 11.50	100	19	25	76
11.50 - 11.75	100	21	25	84
11.75 - 12.00	100	22	25	88
12.00 - 12.25	100	25	25	100
12.25 - 12.50	100	23	25	92
12.50 - 12.75	100	12	25	48
12.75 - 13.00	100	31	25	124
13.00 - 13.25	100	30	25	120
13.25 - 13.50	100	25	25	100
13.50 - 13.75	100	31	25	124
13.75 - 14.00	100	29	25	116
14.00 - 14.25	100	32	25	128
14.25 - 14.50	100	55	25	220
14.50 - 14.75	100	63	25	252
14.75 - 15.00	100	33	25	132
15.00 - 15.25	100	17	25	68
15.25 - 15.50	100	7	25	28
15.50 - 15.75	100	10	25	40
15.75 - 16.00	100	102	25	408
16.00 - 16.03	100	50	3	1667
-				
-				

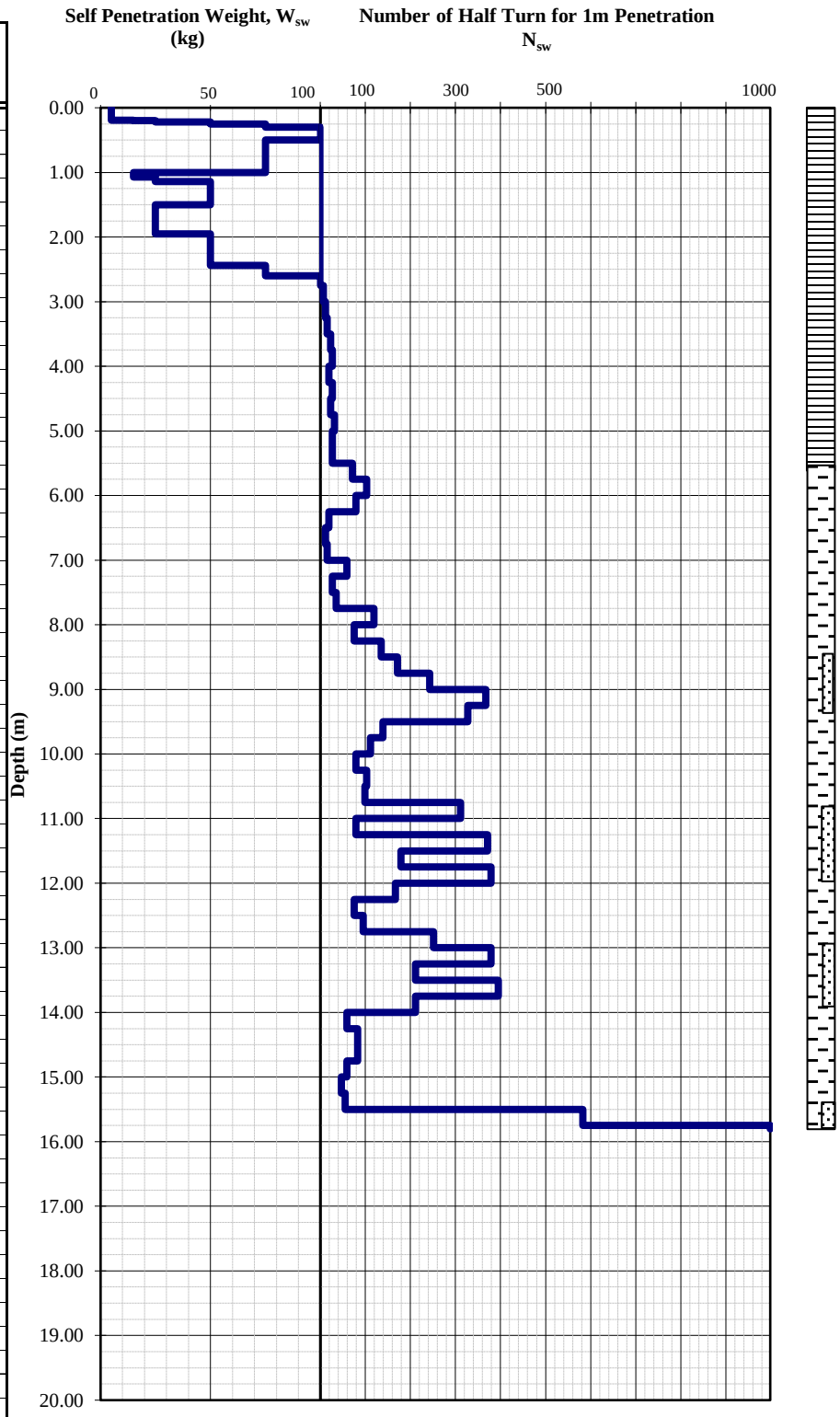


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-24-12
Location : N : 2400525.82 E :385293.53
Ground Level : +1.02mMSL

Tested Date : 13-Oct-14
Performed by : Tomohiro Sadamoto
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.19	5	N.A.	19	N.A.
0.19 - 0.20	15	N.A.	1	N.A.
0.20 - 0.22	25	N.A.	2	N.A.
0.22 - 0.25	50	N.A.	3	N.A.
0.25 - 0.30	75	N.A.	5	N.A.
0.30 - 0.50	100	N.A.	20	N.A.
0.50 - 1.00	75	N.A.	50	N.A.
1.00 - 1.07	15	N.A.	7	N.A.
1.07 - 1.14	25	N.A.	7	N.A.
1.14 - 1.50	50	N.A.	36	N.A.
1.50 - 1.95	25	N.A.	45	N.A.
1.95 - 2.00	50	N.A.	5	N.A.
2.00 - 2.44	50	N.A.	44	N.A.
2.44 - 2.50	75	N.A.	6	N.A.
2.50 - 2.60	75	N.A.	10	N.A.
2.60 - 2.75	100	N.A.	15	N.A.
2.75 - 3.00	100	2	25	8
3.00 - 3.25	100	3	25	12
3.25 - 3.50	100	4	25	16
3.50 - 3.75	100	6	25	24
3.75 - 4.00	100	7	25	28
4.00 - 4.25	100	5	25	20
4.25 - 4.50	100	7	25	28
4.50 - 4.75	100	6	25	24
4.75 - 5.00	100	8	25	32
5.00 - 5.25	100	7	25	28
5.25 - 5.50	100	7	25	28
5.50 - 5.75	100	18	25	72
5.75 - 6.00	100	26	25	104
6.00 - 6.25	100	20	25	80
6.25 - 6.50	100	5	25	20
6.50 - 6.75	100	3	25	12
6.75 - 7.00	100	4	25	16
7.00 - 7.25	100	15	25	60
7.25 - 7.50	100	7	25	28
7.50 - 7.75	100	9	25	36
7.75 - 8.00	100	30	25	120
8.00 - 8.25	100	19	25	76
8.25 - 8.50	100	34	25	136
8.50 - 8.75	100	43	25	172
8.75 - 9.00	100	61	25	244
9.00 - 9.25	100	92	25	368
9.25 - 9.50	100	82	25	328
9.50 - 9.75	100	35	25	140
9.75 - 10.00	100	28	25	112
10.00 - 10.25	100	20	25	80
10.25 - 10.50	100	26	25	104
10.50 - 10.75	100	25	25	100
10.75 - 11.00	100	78	25	312
11.00 - 11.25	100	20	25	80
11.25 - 11.50	100	93	25	372
11.50 - 11.75	100	45	25	180
11.75 - 12.00	100	95	25	380
12.00 - 12.25	100	42	25	168
12.25 - 12.50	100	19	25	76
12.50 - 12.75	100	24	25	96
12.75 - 13.00	100	63	25	252
13.00 - 13.25	100	95	25	380
13.25 - 13.50	100	53	25	212
13.50 - 13.75	100	99	25	396
13.75 - 14.00	100	53	25	212
14.00 - 14.25	100	15	25	60
14.25 - 14.50	100	21	25	84
14.50 - 14.75	100	21	25	84
14.75 - 15.00	100	15	25	60
15.00 - 15.25	100	12	25	48
15.25 - 15.50	100	14	25	56
15.50 - 15.75	100	146	25	584
15.75 - 15.80	100	50	5	1000
-				

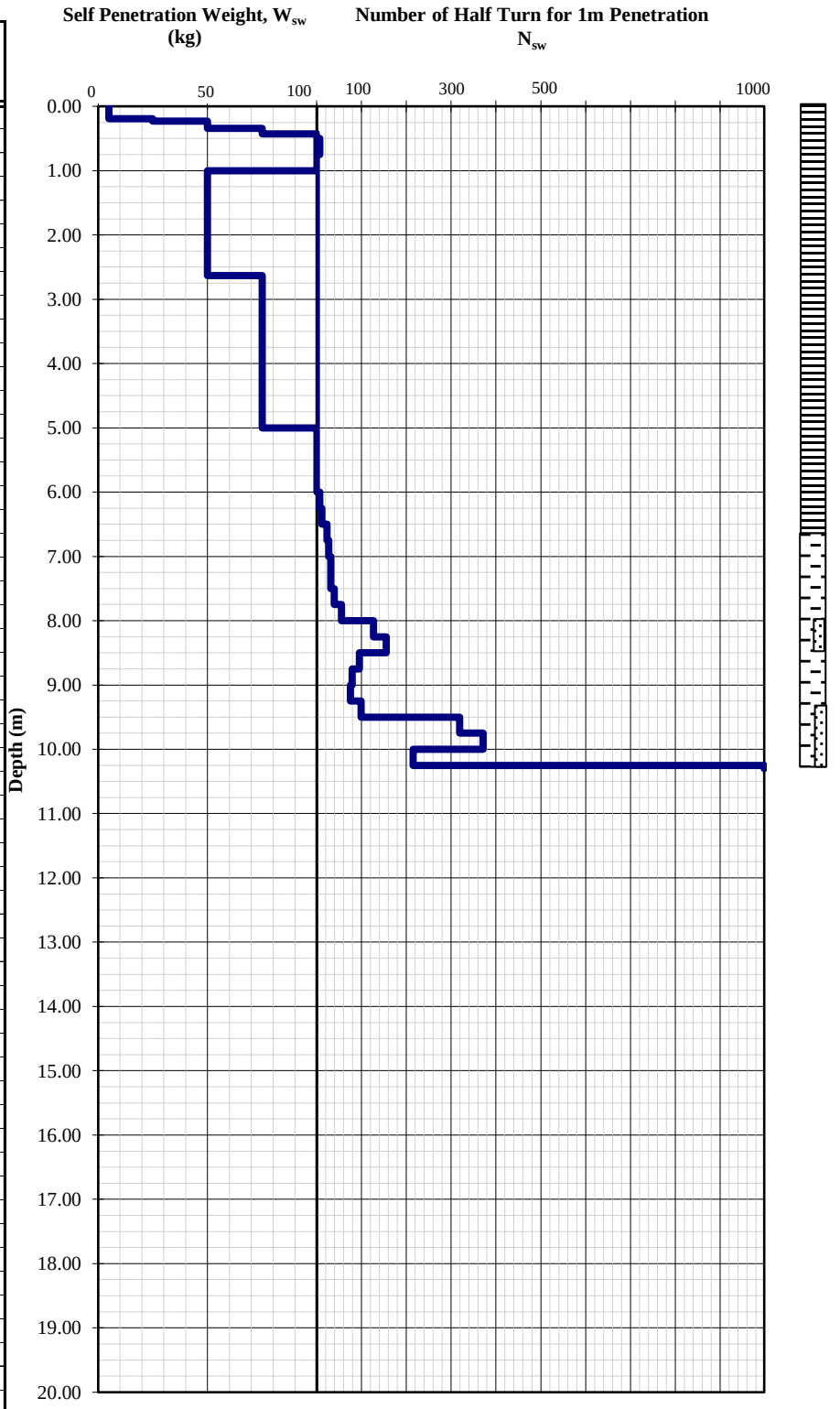


Result of Swedish Weight Sounding

Project Name : Matarbari PP
Project No. : _
Test No. : SW-24-14
Location : N : 2400120.01 E :385292.18
Ground Level : +0.68mMSL

Tested Date : 12-Oct-14
Performed by : Tomohiro Sadamoto
Remarks : SWS-EQ001

Depth (m)	W_{sw} (kg)	Nos of Half-Turns, N_a	Penetration, L (cm)	Nos of Half-Turns/m, N_{sw}
0.00 - 0.19	5	N.A.	19	N.A.
0.19 - 0.19	15	N.A.	0	N.A.
0.19 - 0.23	25	N.A.	4	N.A.
0.23 - 0.34	50	N.A.	11	N.A.
0.34 - 0.43	75	N.A.	9	N.A.
0.43 - 0.50	100	N.A.	7	N.A.
0.50 - 0.75	100	2	25	8
0.75 - 1.00	100	N.A.	25	N.A.
1.00 - 1.50	50	N.A.	50	N.A.
1.50 - 2.00	50	N.A.	50	N.A.
2.00 - 2.50	50	N.A.	50	N.A.
2.50 - 2.63	50	N.A.	13	N.A.
2.63 - 3.00	75	N.A.	37	N.A.
3.00 - 3.50	75	N.A.	50	N.A.
3.50 - 4.00	75	N.A.	50	N.A.
4.00 - 4.50	75	N.A.	50	N.A.
4.50 - 5.00	75	N.A.	50	N.A.
5.00 - 5.50	100	N.A.	50	N.A.
5.50 - 6.00	100	N.A.	50	N.A.
6.00 - 6.25	100	2	25	8
6.25 - 6.50	100	3	25	12
6.50 - 6.75	100	6	25	24
6.75 - 7.00	100	7	25	28
7.00 - 7.25	100	8	25	32
7.25 - 7.50	100	8	25	32
7.50 - 7.75	100	10	25	40
7.75 - 8.00	100	14	25	56
8.00 - 8.25	100	32	25	128
8.25 - 8.50	100	39	25	156
8.50 - 8.75	100	24	25	96
8.75 - 9.00	100	20	25	80
9.00 - 9.25	100	19	25	76
9.25 - 9.50	100	25	25	100
9.50 - 9.75	100	80	25	320
9.75 - 10.00	100	93	25	372
10.00 - 10.25	100	54	25	216
10.25 - 10.30	100	50	5	1000
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				
-				



Appendix-C17-03

Results of Laboratory Tests

Table 6 Quantities of laboratory tests done, off-site laboratory

Area	BH No	Sample No	Depth (m)		Sample Material	Test Item										
			from	to		QU	UU	CU bar	Cons	Wn	Gs	LL & PL	Sieve	Hydro	Compaction	Trixial(CD)
Approach Area	OF-02-1	D-1	2.00	2.80	Silty Sand					1	1	1	1	1		
		D-2	5.00	5.80	Silty Sand					1	1	1	1	1		
		D-3	8.00	8.80	Silty Sand, Sandy Silt					1	1	1	1	1		
		D-4	11.00	11.90	Silty Sand, Sandy Silt					1	1	1	1	1		
	OF-03-1	D-1	1.00	1.80	Silty sand					1	1	1	1	1		
		D-2	5.00	5.80	Silty sand,Clayey Silt					1	1	1	1	1		
		D-3	8.00	8.80	Sandy Silt, Silty Sand					1	1	1	1	1		
		D-4	11.00	11.80	Sandy Silt					1	1	1	1	1		
	OF-03-1a	D-1	4.00	4.80	Silty Sand					1	1	1	1	1		
		D-2	7.00	7.80	Silty Sand					1	1	1	1	1		
	OF-03-1b	D-1	2.00	2.80	Silty Sand					1	1	1	1	1		
		D-2	5.00	5.80	Silty Sand					1	1	1	1	1		
		D-3	8.00	8.80	Sandy Silt, Silty Sand					1	1	1	1	1		
	OF-03-1c	D-1	1.00	1.90	Silty Sand					1	1	1	1	1	1	1
	OF-04-1	D-1	1.00	1.90	Silty Sand					1	1	1	1	1		
		D-2	5.00	5.5.9	Silty Sand					1	1	1	1	1		
		HP-1	8.00	8.90	Silty Sand					1	1	1	1	1		
		D-3	11.00	11.90	Silty Sand					1	1	1	1	1		
	OF-04-2	D-1	2.00	2.80	Silty Sand					1	1	1	1	1		
		D-2	5.00	5.80	Silty Sand					1	1	1	1	1	1	1
		D-3	8.00	8.78	Silty Sand					1	1	1	1	1		
		D-4	14.00	14.95	Silty Sand with Sandy Silt					1	1	1	1	1		
		D-5	18.00	18.95	Silty Sand					1	1	1	1	1		
	OF-04-3	D-1	3.00	3.90	Silty Sand					1	1	1	1	1		
		D-2	6.00	6.90	Silty Sand					1	1	1	1	1		
		D-3	9.00	9.90	Silty Sand					1	1	1	1	1		
		D-4	12.00	12.90	Silty Sand					1	1	1	1	1		
	OF-05-1	D-1	2.00	2.50	Silty Sand					1	1	1	1	1		
		D-2	2.50	3.30	Silty Sand					1	1	1	1	1		
		D-3	6.00	6.80	Silty Sand					1	1	1	1	1		
		D-4	9.00	9.50	Silty Sand					1	1	1	1	1		
		D-5	12.00	12.30	Silty Sand					1	1	1	1	1		
		D-6	12.30	12.90	Silty Sand					1	1	1	1	1		
		D-7	15.00	15.75	Silty Sand					1	1	1	1	1		
		D-8	18.00	18.80	Silty Sand					1	1	1	1	1		
	OF-05-1a	D-1	4.00	4.90	Silty Sand					1	1	1	1	1		
		D-2	4.90	5.70	Silty Sand					1	1	1	1	1		
		D-3	8.00	8.75	Silty Sand					1	1	1	1	1		
		D-4	11.00	11.90	Silty Sand					1	1	1	1	1		
		D-5	15.00	15.90	Sandy Silt					1	1	1	1	1		
		D-6	18.00	18.90	Silty Sand, Sandy Silt					1	1	1	1	1		
	OF-05-1b	D-1	7.00	7.80	Silty Sand					1	1	1	1	1		
		D-2	10.00	10.90	Silty sand					1	1	1	1	1		
		D-3	13.00	13.70	Silty sand					1	1	1	1	1		
		D-4	16.00	16.80	Silty Sand					1	1	1	1	1		
	OF-05-2	D-1	1.00	1.80	Silty Sand					1	1		1	1	1	1
		D-2	3.00	3.80	Sandy Silt					1	1		1	1		
		D-3	5.00	5.80	Silty Sand					1	1		1	1	1	1
		D-4	7.00	7.80	Silty Sand					1	1		1	1		
		D-5	10.00	10.50	Silty Sand					1	1		1	1		
		D-6	10.50	11.30	Silty Sand					1	1		1	1		
		D-7	14.00	14.80	Silty Sand					1	1		1	1	1	1
		D-8	17.00	17.80	Silty Sand with Sandy Silt					1	1		1	1		
		D-9	20.00	20.80	Silty Sand					1	1		1	1		
		D-10	23.00	23.75	Silty Sand with Silty Clay					1	1		1	1		
		D-11	25.00	25.50	Silty Sand					1	1		1	1		
	OF-05-3	D-1	2.00	2.80	Silty Clay					1	1	1	1	1		
		D-2	5.00	5.80	Silty Sand					1	1	1	1	1		
		D-3	8.00	8.90	Silty Sand					1	1	1	1	1		
		D-4	11.00	11.60	Silty Sand					1	1	1	1	1		
		D-5	14.00	14.60	Silty Sand					1	1	1	1	1		
		D-6	17.00	17.60	Silty Sand with Clay					1	1	1	1	1		
		D-7	20.00	20.70	Silty Sand					1	1	1	1	1		
	OF-05-3a	D-1	10.00	10.70	Silty Sand					1	1	1	1	1	1	1
		D-2	13.00	13.80	Silty Sand					1	1	1	1	1		
		D-3	18.00	18.50	Silty Sand with Sandy Silt					1	1	1	1	1		
	OF-05-3b	D-1	3.00	3.90	Silty Sand					1	1	1	1	1		
		D-2	6.00	6.90	Sandy Silt					1	1	1	1	1		
		D-3	10.20	10.93	Silty Sand					1	1	1	1	1	1	1
	Total					0	0	0	0	69	69	58	69	69	7	7

Area	BH No	Sample No	Depth (m)		Sample Material	Test Item										
			from	to		QU	UU	CU bar	Cons	Wn	Gs	LL & PL	Sieve	Hydro	Compaction	Trixial(CD)
Channel Area	LD-12-1	HP-1	2.00	2.90	Clay		1		1	1	1	1	1	1		
		D-1	5.00	5.80	Sand					1	1	1	1	1	1	1
		D-2	8.00	8.85	Sand					1	1	1	1	1		1
		D-3	11.00	11.50	Sand					1	1	1	1	1	1	1
		D-4	14.00	14.50	Silty Sand					1	1	1	1	1		
		D-5	17.00	17.60	Sand					1	1	1	1	1	1	1
		D-6	23.00	23.60	Sand					1	1	1	1	1		
	LD2-10a-1	HP-1	2.00	2.85	Silt					1	1	1	1	1		
		HP-2	5.00	5.90	Sandy Silt, Silty Sand					1	1	1	1	1		
		D-1	8.00	8.85	Silty Sand					1	1	1	1	1		
		D-2	11.00	11.80	Silty Sand					1	1	1	1	1		
		D-3	16.00	16.90	Sandy Silt					1	1	1	1	1		
		D-4	19.00	19.80	Silty Sand					1	1	1	1	1		
	LD2-11-1	HP-1	2.00	2.80	Clay		1		1	1	1	1	1	1		
		HP-2	5.00	5.90	Sandy Silt		1	1	1	1	1	1	1	1		
		HP-3	8.00	8.90	Clay		1		1	1	1	1	1	1		
		HP-4	11.00	11.80	Silty Sand					1	1	1	1	1		
		D-1	14.00	14.80	Silty Sand					1	1	1	1	1	1	1
		D-2	17.00	17.80	Sandy Silt					1	1	1	1	1		
		D-3	20.00	20.80	Silty Sand					1	1	1	1	1		
	LD2-11-1a	HP-1	2.00	2.85	Clayey Silt					1	1	1	1	1		
		HP-2	5.00	5.90	Clayey Silt					1	1	1	1	1		
		HP-3	8.00	8.90	Silty Clay					1	1	1	1	1		
		D-1	11.00	11.80	Silty Sand					1	1	1	1	1		
		D-2	14.00	14.60	Silty Sand					1	1	1	1	1	1	1
		D-3	17.00	17.80	Sand					1	1	1	1	1		
		D-4	20.00	20.70	Silty Sand					1	1	1	1	1		
	LD2-11-1b	HP-1	2.00	2.90	Clay		1			1	1	1	1	1		
		HP-2	6.00	6.90	Clayey Silt			1		1	1	1	1	1		
		HP-3	9.00	9.50	Silty Sand					1	1	1	1	1		
		D-1	12.00	12.85	Sandy Silt					1	1	1	1	1		
		D-2	15.00	15.85	Sandy Silt					1	1	1	1	1		
		D-3	18.00	18.60	Silty Sand					1	1	1	1	1		
	LD2-12-1a	HP-1	2.00	2.90	Clay		1		1	1	1	1	1	1		
		D-1	6.00	6.70	Sand					1	1	1	1	1		1
		D-2	9.00	9.85	Sandy Silt		1		1	1	1	1	1	1		
		D-3	12.00	12.30	Clay					1	1	1	1	1		
			12.30	12.80	Silty Sand					1	1	1	1	1		1
		D-4	15.00	15.70	Silty Sand					1	1	1	1	1		1
	LD2-12-1b	D-1	3.00	3.90	Silty Sand					1	1	1	1	1		
		HP-1	6.00	6.60	Clay					1	1	1	1	1		
			6.60	6.80	Silty Sand					1	1	1	1	1		
		D-2	9.00	9.65	Silty Sand					1	1	1	1	1	1	1
		D-3	12.00	12.65	Silty Sand					1	1	1	1	1		
		D-4	16.00	16.90	Silty Sand					1	1	1	1	1		
		D-5	18.00	18.90	Silty Sand with Silty Clay					1	1	1	1	1		
		D-6	22.00	22.90	Silty Clay with Silty Sand					1	1	1	1	1		
	LD2-13-1	HP-1	2.00	2.80	Silty Clay					1	1	1	1	1		
		HP-2	5.00	5.80	Sandy Silt					1	1	1	1	1		
		D-1	8.00	8.85	Silty Sand					1	1	1	1	1		
		D-2	11.00	11.80	Silty Sand					1	1	1	1	1	1	1
		HP-3	14.00	14.70	Clayey Silt, Sandy Silt					1	1	1	1	1		
		D-3	17.00	17.85	Silty Sand					1	1	1	1	1		
	LD2-13-2	HP-1	4.00	4.85	Clay					1	1	1	1	1		
		D-1	6.00	6.50	Silty Sand											
		D-2	6.50	7.00	Silty Sand					4	4	4	4	4	5	4
		D-3	9.00	9.90	Sand											
		D-4	12.00	12.80	Clay					1	1	1	1	1		
		D-5	18.00	18.80	Sandy Silt	1			1	1	1	1	1	1		
	LD2-13-3	D-1	3.00	3.80	Silty Sand					1	1	1	1	1	1	1
		D-2	6.00	6.80	Silty Sand					1	1	1	1	1		
		HP-1	9.00	9.80	Clay with Silty Sand					1	1	1	1	1		
		D-3	12.00	12.45	Silty Sand					1	1	1	1	1	1	1
		D-4	12.50	13.40	Silty Sand					1	1	1	1	1		
		D-5	15.50	16.40	Silty Sand					1	1	1	1	1		
		D-6	18.50	19.40	Sandy Silt with Silty Clay					1	1	1	1	1		
		D-7	21.50	22.40	Silty Clay with Sandy Silt					1	1	1	1	1		
	Total					1	7	2	7	68	68	68	68	68	14	17

Area	BH No	Sample No	Depth (m)		Sample Material	Test Item										
			from	to		QU	UU	CU bar	Cons	Wn	Gs	LL & PL	Sieve	Hydro	Compaction	Triaxial(CD)
Power Plant Area	PP-14-1	HP-1	1.00	1.50	Clay					1	1	1	1	1		
		HP-2	2.00	2.75	Clay					1	1	1	1	1		
		HP-3	5.00	5.80	Sandy Silt					1	1	1	1	1		
		D-1	8.00	8.80	Silty Sand					1	1	1	1	1		
	PP-14-2	HP-1	3.00	3.70	Sandy Silt	1	1		1	1	1	1	1	1		
		HP-2	6.00	6.80	Sandy Silt	1	1		1	1	1	1	1	1		
		HP-3	9.00	9.90	Sandy Silt		1		1	1	1	1	1	1		
		D-1	12.50	13.40	Sand					1	1	1	1	1		1
		D-2	16.00	16.80	Sand					1	1	1	1	1		1
		D-3	19.00	19.90	Sandy Silt		1		1	1	1	1	1	1		
		D-4	22.00	22.50	Silty Sand					1	1	1	1	1		
	PP-14-3	HP-1	1.00	1.80	Organic Clay					1	1	1	1	1		
		HP-2	4.00	4.80	Clay					1	1	1	1	1		
		HP-3	7.00	7.80	Silty Clay					1	1	1	1	1		
		HP-4	10.00	10.70	Silty Clay					1	1	1	1	1		
		HP-5	13.00	13.90	Sandy Silt					1	1	1	1	1		
		HP-6	16.00	16.90	Silty Clay					1	1	1	1	1		
	PP-17-1	HP-1	2.00	2.85	Clay		1	1	1	1	1	1	1	1		
		HP-2	5.00	5.85	Clay		1	1	1	1	1	1	1	1		
		HP-3	8.00	8.85	Sandy Clay		1		1	1	1	1	1	1		
		D-1	15.00	15.85	Clay				1	1	1	1	1	1		
	PP-21-1	HP-1	1.00	1.65	Silty Clay			1	1	1	1	1	1	1		
		HP-2	3.00	3.85	Clayey Silt		1		1	1	1	1	1	1		
		HP-3	6.00	6.85	Silty Clay		1			1	1	1	1	1		
		D-1	11.00	11.85	Silty Sand with Clayey Silt					1	1	1	1	1		1
	PP-21-2	HP-1	2.00	2.90	Clay		1		1	1	1	1	1	1		
		HP-2	5.00	5.85	Silt		1	1	1	1	1	1	1	1		
		D-1	8.00	8.85	Silty Sand					1	1	1	1	1		
		D-2	11.00	11.85	Sand					1	1	1	1	1		1
		D-3	14.00	14.85	Silty Sand					1	1	1	1	1		
		HP-3	17.00	17.20	Silt	1				1	1	1	1	1		
	PP21-3	HP-1	1.00	1.90	Silty Clay		1		1	1	1	1	1	1		
		D-1	4.00	4.20	Silty Sand					1	1	1	1	1		
		HP-2	5.00	5.90	Silty Sand					1	1	1	1	1		
		D-2	7.00	7.75	Silty Sand					1	1	1	1	1		
		D-3	11.00	11.90	Silty Sand					1	1	1	1	1	1	1
	PP-24-1	HP-1	2.00	2.85	Clay		1		1	1	1	1	1	1		
		HP-2	5.00	5.90	Clay		1		1	1	1	1	1	1		
		D-1	8.00	8.70	Silty Sand					1	1	1	1	1		
		D-2	11.00	11.60	Silty Sand					1	1	1	1	1		1
		D-3	14.00	14.85	Silty Sand					1	1	1	1	1		
	PP3-15-1	HP-1	1.00	1.75	Clay					1	1	1	1	1		
		HP-2	4.00	4.75	Silty Clay					1	1	1	1	1		
	PP3-15-2	HP-1	1.00	1.50	Clay					1	1	1	1	1		
		HP-2	2.00	2.85	Organic Clay					1	1	1	1	1		
		HP-3	5.00	5.90	Clay					1	1	1	1	1		
		HP-4	8.00	8.90	Clay with Sandy Silt					1	1	1	1	1		
		HP-5	11.00	11.80	Clay with Sandy Silt					1	1	1	1	1		
		HP-6	14.00	14.60	Clay with Sandy Silt					1	1	1	1	1		
	PP3-17-1	HP-1	1.00	1.80	Organic Clay					1	1	1	1	1		
		HP-2	4.00	4.77	Silty Clay					1	1	1	1	1		
		HP-3	7.00	7.24	Silty Clay					1	1	1	1	1		
		HP-4	7.50	8.40	Silty Clay					1	1	1	1	1		
	PP3-17-2	HP-1	1.00	1.90	Organic Clay					1	1	1	1	1		
		HP-2	4.00	4.90	Clay					1	1	1	1	1		
		HP-3	7.00	7.90	Clay					1	1	1	1	1		
		HP-4	11.00	11.90	Silty Sand with Sandy Silt					1	1	1	1	1		
	PP3-19-1	HP-1	1.00	1.70	Organic Clay					1	1	1	1	1		
		HP-2	3.00	3.83	Silty Clay					1	1	1	1	1		
		HP-3	6.00	6.40	Silty Clay					1	1	1	1	1		
		HP-4	6.50	7.35	Silty Clay					1	1	1	1	1		
		HP-5	10.00	10.85	Silty Clay					1	1	1	1	1		
		HP-6	13.00	13.85	Silty Clay					1	1	1	1	1		
	PP3-19-2	HP-1	3.00	3.85	Clay		1	1	1	1	1	1	1	1		
		HP-2	6.00	6.90	Clay		1		1	1	1	1	1	1		
		D-1	9.50	10.30	Silty Sand					1	1	1	1	1		
		HP-3	13.00	13.85	Silt				1	1	1	1	1	1		
		HP-4	16.00	16.85	Silty Sand					1	1	1	1	1		
	PP3-19-3	HP-1	1.00	1.90	Clay					1	1	1	1	1		
		HP-2	4.00	4.85	Silty Sand					1	1	1	1	1		
		HP-3	7.00	7.85	Clay with Silty Sand					1	1	1	1	1		
	PP3-23-1	HP-1	1.00	1.85	Silty Clay					1	1	1	1	1		
		HP-2	4.00	4.85	Sandy Silt, Clayey Silt					1	1	1	1	1		
		D-1	7.00	7.85	Silty Sand					1	1	1	1	1		
	PP3-23-2	HP-1	2.00	2.55	Silty Clay		1		1	1	1	1	1	1		
		HP-2	5.00	5.80	Sandy Silt		1		1	1	1	1	1	1		
		D-1	8.00	8.60	Silty Sand					1	1	1	1	1		
		D-2	11.00	11.85	Silty Sand					1	1	1	1	1		
	PP3-23-3	HP-1	2.00	2.75	Silty Clay					1	1	1	1	1		
		HP-2	5.00	5.75	Silty Clay, Clayey Silt					1	1	1	1	1		
	PP3-24-1	HP-1	2.00	2.80	Clayey Silt					1	1	1	1	1		
		HP-2	5.00	5.85	Silty Sand					1	1	1	1	1		
		D-1	8.00	8.85	Silty Sand					1	1	1	1	1		
	PP3-24-2	HP-1	2.00	2.70	Silty Clay					1	1	1	1	1		
		HP-2	5.00	5.85	Silty Clay, Clayey Silt					1	1	1	1	1		
		D-1	9.00	9.85	Clay, Silty Sand					1	1	1	1	1		
	Total					3	18	5	20	86	86	86	86	86	1	6
	Total (OF+LD+PP)					4	25	7	27	223	223	212	223	223	22	30

Table 7 Quantities of laboratory tests done, site laboratory

Area	BH No	Sample No	Depth (m)		Sample Material	Test Item			Remarks
			from	to		LL & PL	Sieve	TSS	
Channel Area	LD2-11-1	SPT-6	9.00	9.45	Silty Sand		1		
		SPT-7	10.00	10.45	Silty Sand		1		
		SPT-8	12.00	12.45	Silty Sand		1		
		SPT-9	13.00	13.45	Silty Sand		1		
		D-1	14.00	14.80	Silty Sand		1		
		SPT-10	15.00	15.45	Silty Sand		1		
		SPT-11	16.00	16.45	Silty Sand		1		
		SPT-12	18.00	18.45	Silty Sand		1		
		SPT-13	19.00	19.45	Silty Sand		1		
		SPT-17	24.00	24.45	Sandy Silt		1		
		SPT-18	25.00	25.45	Sandy Silt		1		
		SPT-19	26.00	26.45	Sandy Silt		1		
		SPT-20	27.00	27.45	Sandy Silt		1		
		SPT-21	28.00	28.45	Silty Sand		1		
		SPT-22	29.00	29.45	Silty Sand		1		
		SPT-23	30.00	30.45	Silty Sand		1		
	LD2-13-2	SPT-4	5.00	5.45	Silty Sand		1		
		D-1	6.00	6.50	Silty Sand	1	1		
		D-2	6.50	7.00	Silty Sand	1	1		
		SPT-5R	7.00	7.45	Silty Sand		1		
		SPT-6R	8.00	8.45	Silty Sand		1		
		D-3	9.00	9.60	Silty Sand	1	1		
			9.60	9.90	Silty Sand	1	1		
		SPT-7	10.00	10.45	Silty Sand		1		
		SPT-8	11.00	11.45	Silty Sand		1		
		D-4	12.00	12.80	Clayey Silt	1	1		
		SPT-12	16.00	16.45	Sandy Silt		1		
		SPT-13	17.00	17.45	Silty Sand		1		
		D-5	18.00	18.80	Sandy Silt	1	1		
		SPT-14	19.00	19.45	Sandy Silt		1		
Power Plant Area	PP-14-2	SPT-8	11.00	11.45	Silty Sand		1		
		D-1	12.00	12.95	Silty Sand		1		
		SPT-9	14.00	14.45	Silty Sand		1		
		SPT-10	15.00	15.45	Silty Sand		1		
		D-2	16.00	16.80	Sandy Silt		1		
		SPT-11	17.00	17.45	Sandy Silt		1		
		SPT-12	18.00	18.45	Sandy Silt		1		
		D-3	19.00	19.90	Sandy Silt		1		
		SPT-13	20.00	0.44	Sandy Silt		1		
		SPT-14	21.00	21.45	Clayey Sand		1		
		D-4	22.00	22.50	Clayey Sand		1		
	PP-21-2	SPT-26	31.00	31.28	Silt		1		
		SPT-27	32.00	32.27	Silt		1		
		SPT-28	33.00	33.23	Silty Sand		1		
		SPT-29	34.00	34.21	Silty Sand		1		
		SPT-30	35.00	35.26	Silt		1		
		SPT-31	36.00	36.38	Sandy Silt		1		
		SPT-32	37.00	37.35	Silty Sand		1		
		SPT-33	38.00	38.31	Silty Sand		1		
		SPT-34	40.00	40.33	Silty Sand		1		
		SPT-35	42.00	42.33	Silty Sand		1		
		SPT-36	44.00	44.23	Silty Sand		1		
		SPT-37	46.00	46.29	Silty Sand		1		
		SPT-38	48.00	48.29	Silty Sand		1		
		SPT-39	50.00	50.25	Silty Sand		1		
Addotional		Cx-1	-		Sand		1		Sample provided by the client
		Cx-2	-		Sand		1		
		Sh-1	-		Sand		1		
Total						6	58	14	

1) OF-02-1

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			OF-02-1								
Sample No.			D-1	D-2	D-3	D-4					
Sample Depth			2.00m ~2.80m	5.00m ~5.80m	8.00m ~8.80m	11.00m ~11.90m					
Condition of Sample			Disturbed								
Natural Water Content		%	24.4	20.3	25.0	22.4					
Specific Gravity			2.69	2.69	2.69	2.70					
Wet Density		Mg/m^3	1.97	-	1.94	2.02					
Dry Density		Mg/m^3	1.58	-	1.55	1.65					
Natural Void Ratio			0.70	-	0.74	0.63					
Degree of Saturation		%	94	-	91	95					
Atterberg Limits	Liquid Limit,	%	- *3	- *3	- *3	- *3					
	Plastic Limit,	%	- *3	- *3	- *3	- *3					
	Plasticity Index,	%	- *3	- *3	- *3	- *3					
Grain Size Analysis	Gravel,	%	0	0	0	0					
	Sand,	%	76	73	49	63					
	Silt,	%	11	11	30	13					
	Clay & Colloid,	%	13	16	21	24					
	Max. diameter,	mm	0.850	4.75	0.850	4.75					
	Diam. at 60%	mm	0.150	0.24	0.12	0.20					
	Diam. at 10%	mm	-	-	-	-					
Visual soil description			Clayey Sand	Clayey Sand	Sandy Silt	Clayey Sand					
Unified soil classification			-	-	-	-					
Triaxial compression test	Angle of Internal Friction	(^{0})	-	-	-	-					
	Cohesion Intercept, kPa		-	-	-	-					
	Condition of drainage		-	-	-	-					
	Angle of Internal Friction *2	(^{0})	-	-	-	-					
	Cohesion Intercept, kPa *2		-	-	-	-					
	Condition of drainage		-	-	-	-					
Consolidation Test	Preconsolidation Pressure,	kPa	-	-	-	-					
	Compression Index(Average)		-	-	-	-					
	Pressure Range for Compression Index(kPa)		-	-	-	-					
	Swell index		-	-	-	-					
Chemical Test	pH value		-	-	-	-					
	Total sulphate content as SO_3,	%	-	-	-	-					
	Chloride content as Cl,	%	-	-	-	-					
	Organic Matter content,	%	-	-	-	-					
Unconfined Compression Strength (kPa)			-	-	-	-					
Strain at failure (%)			-	-	-	-					

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **10.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

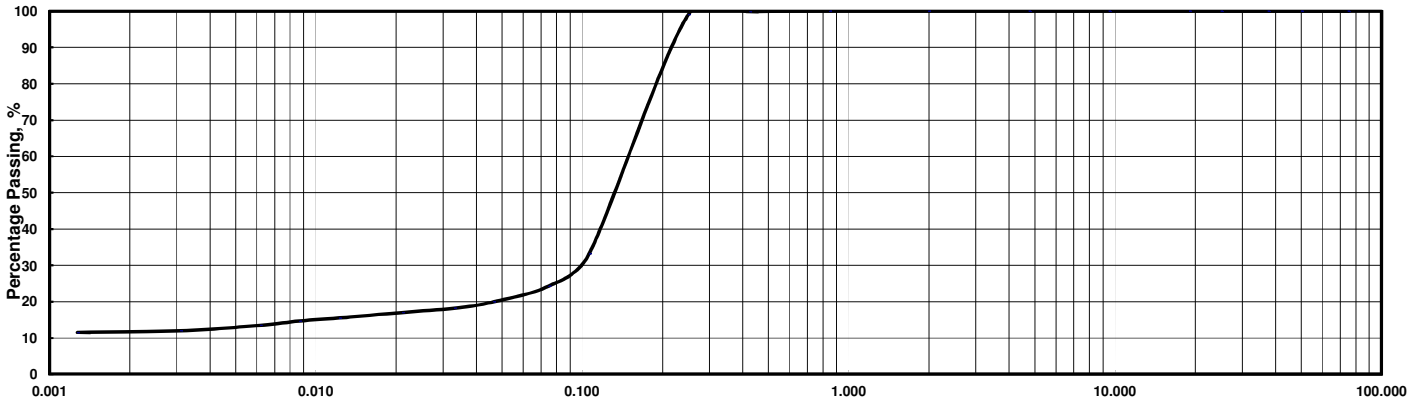
Sample No. : **OF-02-1 D-1** Depth : **2.00-2.80m** (_____) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.1	33.2	24.4
Hydro.	Dia., mm	0.047	0.033	0.021	0.012	0.0087	0.0062	0.0031	0.0013							
	% Passing	20.0	18.2	17.0	15.5	14.7	13.5	12.0	11.5							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-02-1 D-1 2.00-2.80m		Sample No. Depth	OF-02-1 D-1 2.00-2.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.150 mm	
2.00 - 0.425 mm	0.2 %		Dia. at 30%	0.094 mm	
0.425 - 0.075 mm	75.4 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	11.4 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	12.9 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	24.4 %				

Kiso-Jiban Consultants Co., Ltd.

7

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **10.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

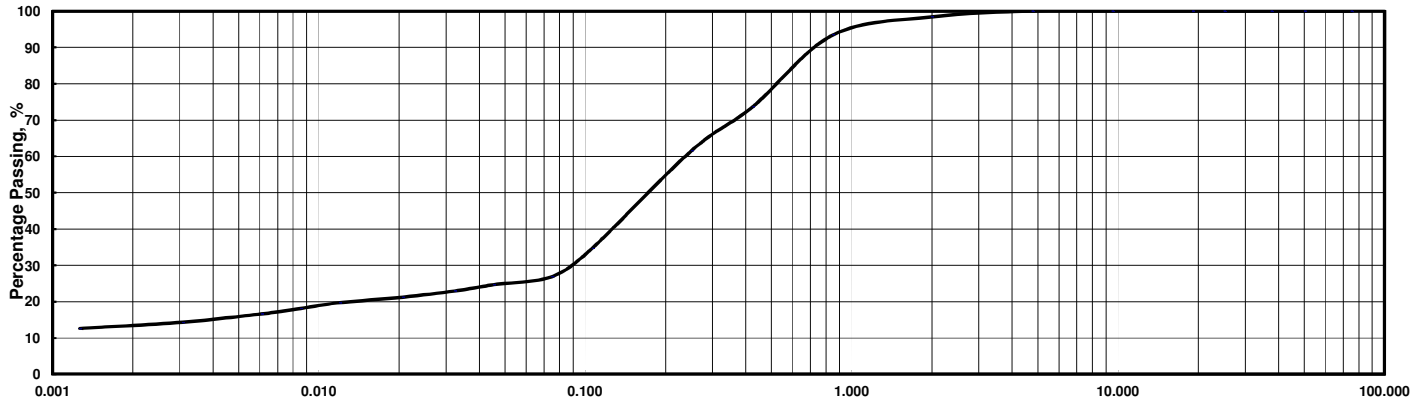
Sample No. : **OF-02-1 D-2** Depth : **5.00-5.80m** (_____) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.4	93.4	73.7	61.6	34.7	26.9
Hydro.	Dia., mm	0.045	0.032	0.021	0.012	0.0085	0.0061	0.0031	0.0013							
	% Passing	24.7	23.0	21.2	19.7	18.1	16.6	14.3	12.6							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-02-1 D-2 5.00-5.80m			Sample No. Depth	OF-02-1 D-2 5.00-5.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm
4.75 - 2.00 mm	1.6	%		Dia. at 60%	0.24	mm
2.00 - 0.425 mm	24.7	%		Dia. at 30%	0.086	mm
0.425 - 0.075 mm	46.8	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	11.1	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	15.8	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	93.4	%				
75um Sieve Passing	26.9	%				

Kiso-Jiban Consultants Co., Ltd.

8

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **10.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

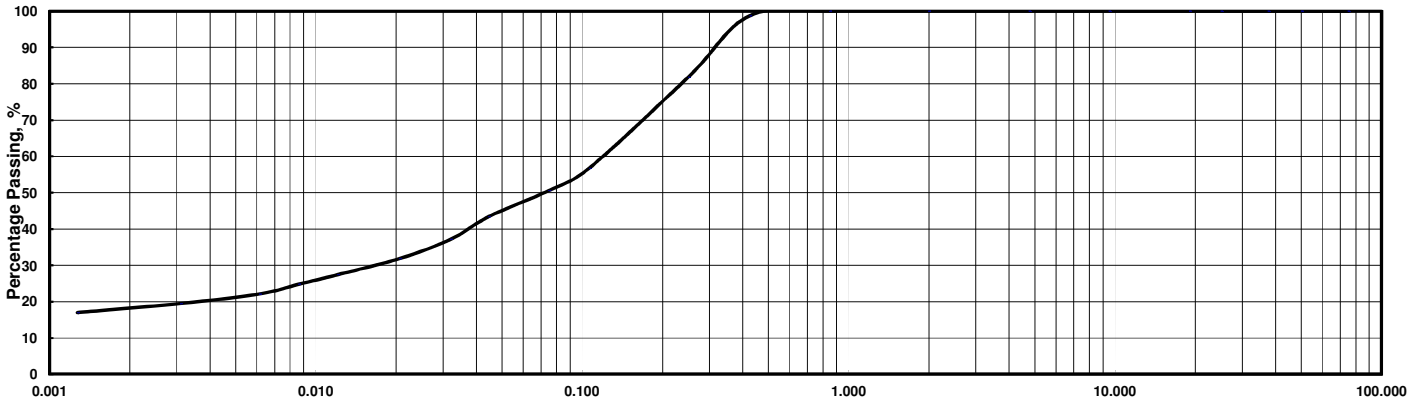
Sample No. : **OF-02-1 D-3** Depth : **8.00-8.80m** (_____) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.7	81.9	56.8	50.6
Hydro.	Dia., mm	0.044	0.032	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	43.4	37.2	31.9	27.5	24.8	22.1	19.5	17.0							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-02-1 D-3 8.00-8.80m		Sample No. Depth	OF-02-1 D-3 8.00-8.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.12 mm	
2.00 - 0.425 mm	1.3 %		Dia. at 30%	0.016 mm	
0.425 - 0.075 mm	48.1 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	29.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	21.2 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	50.6 %				

Kiso-Jiban Consultants Co., Ltd.

9

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **10.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

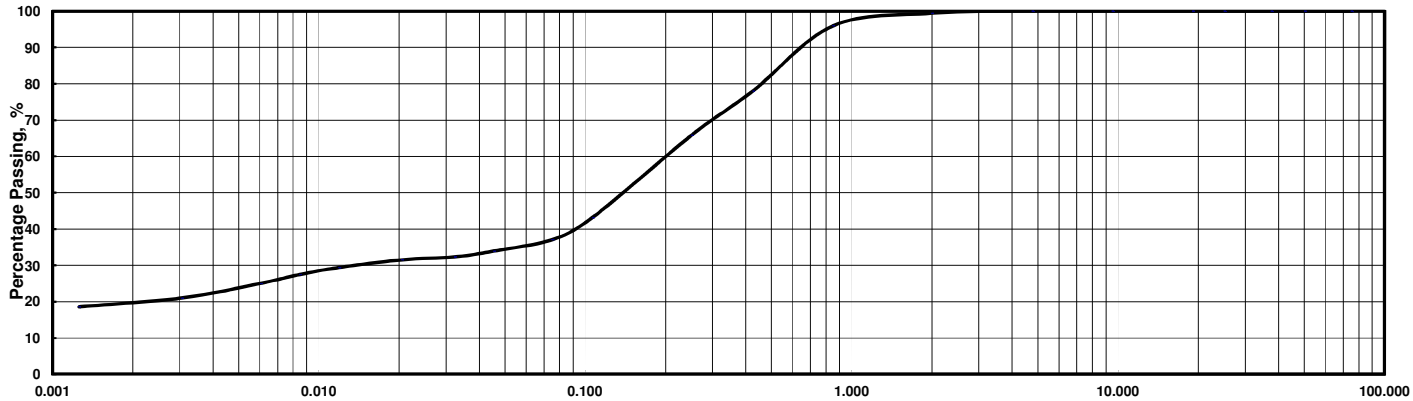
Sample No. : **OF-02-1 D-4** Depth : **11.00-11.90m** (_____) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	95.9	78.0	65.8	43.1	37.1
Hydro.	Dia., mm	0.045	0.032	0.020	0.012	0.0085	0.0060	0.0031	0.0013							
	% Passing	33.9	32.3	31.5	29.4	27.5	25.0	21.0	18.6							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-02-1 D-4 11.00-11.90m		Sample No. Depth	OF-02-1 D-4 11.00-11.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.6 %		Dia. at 60%	0.20 mm	
2.00 - 0.425 mm	21.4 %		Dia. at 30%	0.014 mm	
0.425 - 0.075 mm	40.9 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	13.4 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	23.7 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	95.9 %				
75um Sieve Passing	37.1 %				

Kiso-Jiban Consultants Co., Ltd.

10

2) OF-03-1

11

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			OF-03-1								
Sample No.			D-1	D-2	D-3	D-4					
Sample Depth			1.00m ~1.80m	5.00m ~5.80m	8.00m ~8.80m	11.00m ~11.80m					
Condition of Sample			Disturbed								
Natural Water Content		%	23.1	33.6	29.8	29.1					
Specific Gravity			2.69	2.72	2.71	2.71					
Wet Density		Mg/m^3	2.04	2.01	-	2.12					
Dry Density		Mg/m^3	1.66	1.50	-	1.64					
Natural Void Ratio			0.62	0.81	-	0.65					
Degree of Saturation		%	99	100	-	100					
Atterberg Limits	Liquid Limit,	%	- *3	24	27	- *3					
	Plastic Limit,	%	- *3	17	19	- *3					
	Plasticity Index,	%	- *3	7	8	- *3					
Grain Size Analysis	Gravel,	%	0	0	0	0					
	Sand,	%	65	50	32	24					
	Silt,	%	19	22	40	52					
	Clay & Colloid,	%	16	28	28	24					
	Max. diameter,	mm	2.00	0.425	2.00	0.850					
	Diam. at 60%	mm	0.16	0.11	0.054	0.048					
	Diam. at 10%	mm	-	-	-	-					
Visual soil description			Silty Sand	Clayey Sand	Sandy Clay	Silt with Sand					
Unified soil classification			-	SC	CL	-					
Triaxial compression test	Angle of Internal Friction	(^{0})	-	-	-	-					
	Cohesion Intercept, kPa		-	-	-	-					
	Condition of drainage		-	-	-	-					
	Angle of Internal Friction *2	(^{0})	-	-	-	-					
	Cohesion Intercept, kPa *2		-	-	-	-					
	Condition of drainage		-	-	-	-					
Consolidation Test	Preconsolidation Pressure,	kPa	-	-	-	-					
	Compression Index(Average)		-	-	-	-					
	Pressure Range for Compression Index(kPa)		-	-	-	-					
	Swell index		-	-	-	-					
Chemical Test	pH value		-	-	-	-					
	Total sulphate content as SO_3,	%	-	-	-	-					
	Chloride content as Cl,	%	-	-	-	-					
	Organic Matter content,	%	-	-	-	-					
Unconfined Compression Strength (kPa)			-	-	-	-					
Strain at failure (%)			-	-	-	-					

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No. : S27-14

Standard : ASTM D4318-10

Date of Testing : 13.12.14

Tested By : Vasantha

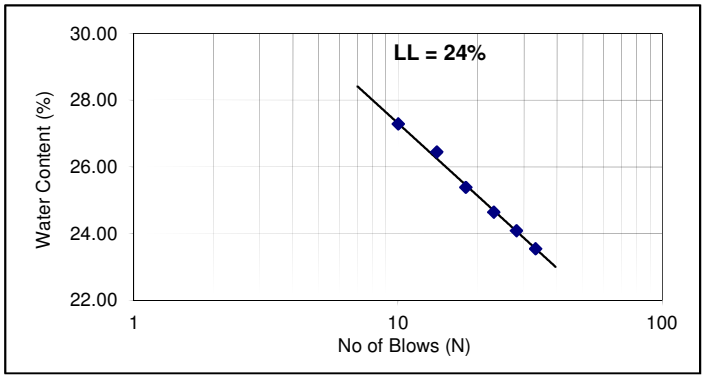
Checked By : A. B. Tan

Sample No. : OF-03-01 D-2

Depth : 5.00-5.80m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	33	23.55
2	28	24.09
3	23	24.64
4	18	25.38
5	14	26.45
6	10	27.29
Liquid Limits %		**24**
Plastic Limits %		**17**
Plasticity Index		**7**

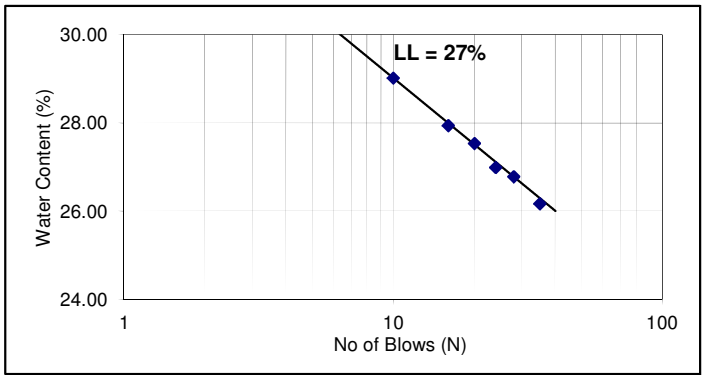


Sample No. : OF-03-01 D-3

Depth : 8.00-8.80m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	35	26.17
2	28	26.78
3	24	26.99
4	20	27.53
5	16	27.93
6	10	29.01
Liquid Limits %		**27**
Plastic Limits %		**19**
Plasticity Index		**8**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **11.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

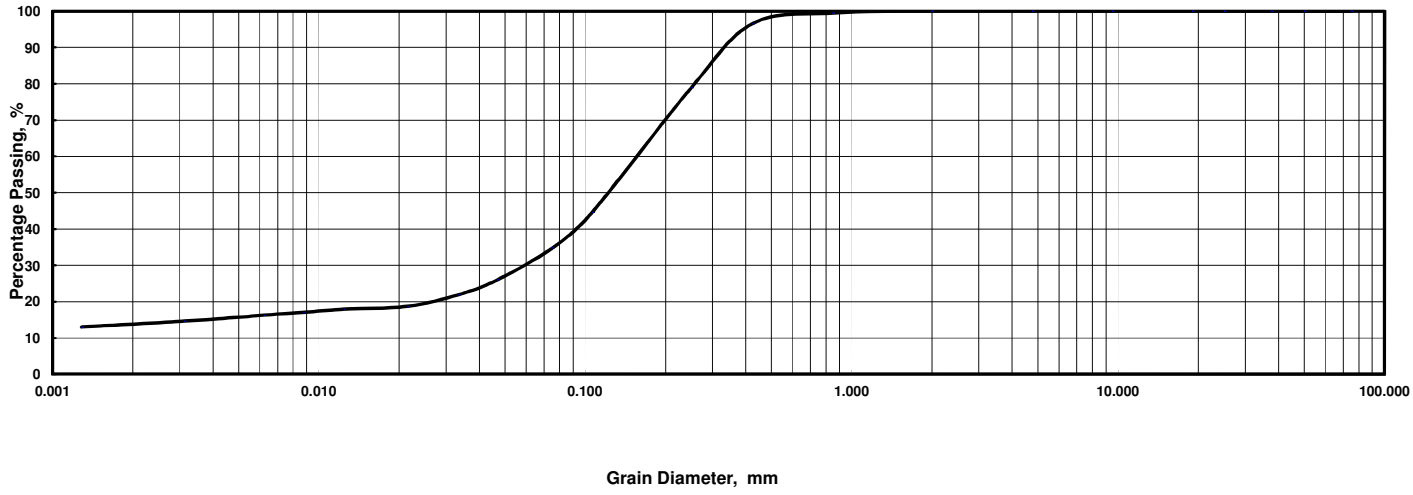
Sample No. : **OF-03-1 D-1** Depth : **1.00-1.80m** (_____) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.5	96.6	79.0	44.6	34.8
Hydro.	Dia., mm	0.047	0.034	0.021	0.012	0.0088	0.0062	0.0031	0.0013							
	% Passing	26.0	22.0	18.7	17.9	17.1	16.3	14.6	13.0							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Sample No. Depth	OF-03-1 D-1 1.00-1.80m			Sample No. Depth	OF-03-1 D-1 1.00-1.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.16	mm
2.00 - 0.425 mm	3.4	%		Dia. at 30%	0.058	mm
0.425 - 0.075 mm	61.8	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	19.1	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	15.6	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.5	%				
75um Sieve Passing	34.8	%				

Kiso-Jiban Consultants Co., Ltd.

14

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **11.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

Sample No. : **OF-03-1 D-2** Depth : **5.00-5.80m** (_____) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	57.9	49.6
Hydro.	Dia., mm	0.044	0.031	0.020	0.012	0.0083	0.0060	0.0030	0.0013							
	% Passing	45.7	43.0	38.4	35.7	32.9	29.6	23.8	20.1							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves

Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-03-1 D-2 5.00-5.80m		Sample No. Depth	OF-03-1 D-2 5.00-5.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.11 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.0062 mm	
0.425 - 0.075 mm	50.4 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	21.9 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	27.7 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	49.6 %				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **11.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

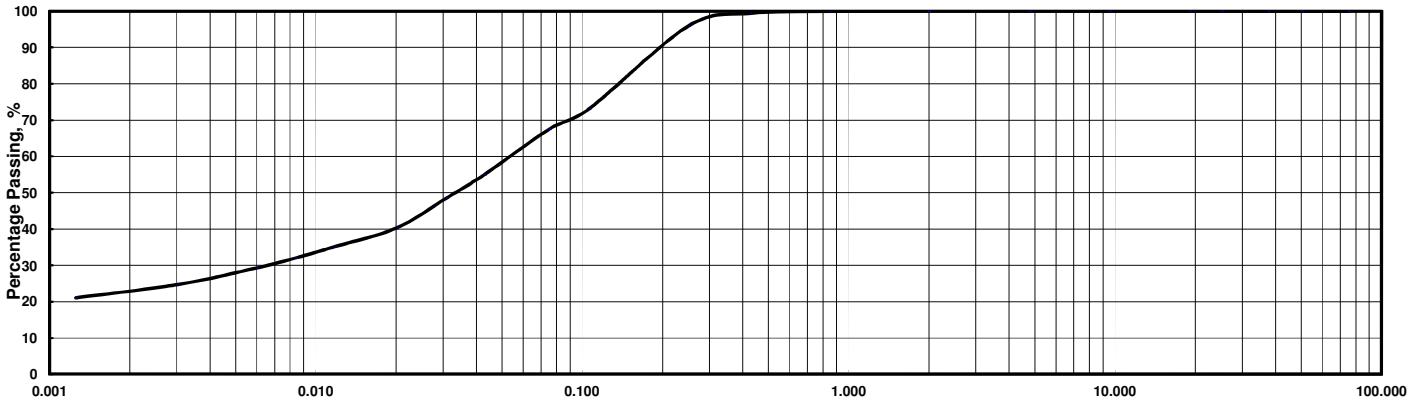
Sample No. : **OF-03-1 D-3** Depth : **8.00-8.80m** (_____) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.4	95.9	73.1	67.5
Hydro.	Dia., mm	0.043	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0013							
	% Passing	55.0	48.5	40.3	35.2	32.1	29.3	24.7	21.1							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-03-1 D-3 8.00-8.80m			Sample No. Depth	OF-03-1 D-3 8.00-8.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.054	mm
2.00 - 0.425 mm	0.6	%		Dia. at 30%	0.0065	mm
0.425 - 0.075 mm	31.9	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	39.7	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	27.8	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.9	%				
75um Sieve Passing	67.5	%				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

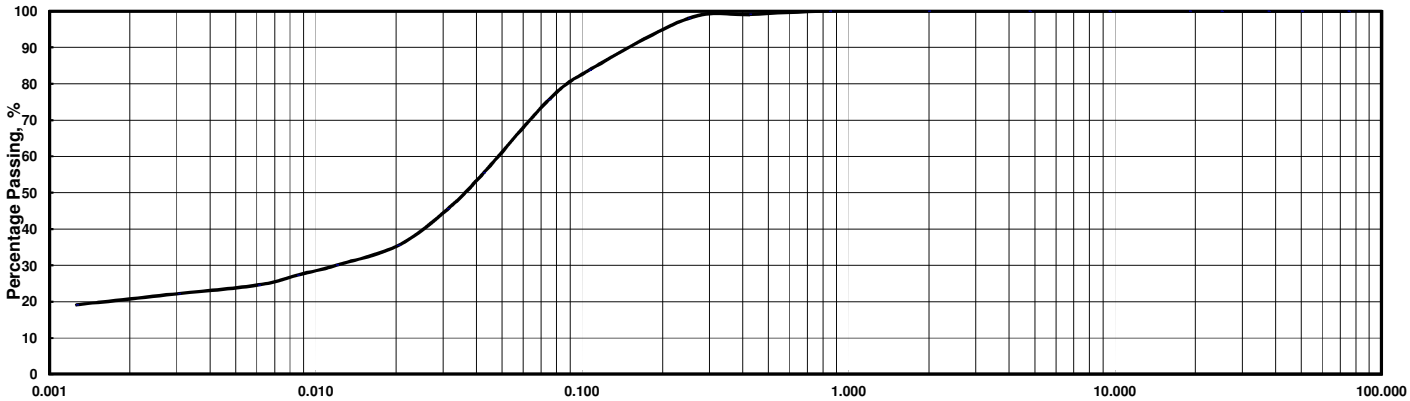
Sample No. : **OF-03-1 D-4** Depth : **11.00-11.80m** (_____) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1	98.0	83.8	75.7
Hydro.	Dia., mm	0.043	0.031	0.020	0.012	0.0085	0.0061	0.0031	0.0013							
	% Passing	55.6	45.5	35.5	30.1	27.3	24.6	22.2	19.1							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-03-1 D-4 11.00-11.80m		Sample No. Depth	OF-03-1 D-4 11.00-11.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.048 mm	
2.00 - 0.425 mm	0.9 %		Dia. at 30%	0.012 mm	
0.425 - 0.075 mm	23.4 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	52.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	23.7 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	75.7 %				

Kiso-Jiban Consultants Co., Ltd.

17

18

3) OF-03-1a

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			**OF-03-1a**								
Sample No.			D-1	D-2							
Sample Depth			4.00m ~4.80m	7.00m ~7.80m							
Condition of Sample			Disturbed								
Natural Water Content		%	25.5	27.5							
Specific Gravity			2.69	2.70							
Wet Density		Mg/m^3	1.92	1.93							
Dry Density		Mg/m^3	1.53	1.51							
Natural Void Ratio			0.76	0.78							
Degree of Saturation		%	90	95							
Atterberg Limits	Liquid Limit,	%	- *3	- *3							
	Plastic Limit,	%	- *3	- *3							
	Plasticity Index,	%	- *3	- *3							
Grain Size Analysis	Gravel,	%	0	0							
	Sand,	%	74	58							
	Silt,	%	10	18							
	Clay & Colloid,	%	16	24							
	Max. diameter,	mm	0.850	0.850							
	Diam. at 60%	mm	0.15	0.12							
	Diam. at 10%	mm	-	-							
Visual soil description			Clayey Sand	Clayey Sand							
Unified soil classification			-	-							
Triaxial compression test	Angle of Internal Friction	(^{0})	-	-							
	Cohesion Intercept, kPa		-	-							
	Condition of drainage		-	-							
	Angle of Internal Friction *2	(^{0})	-	-							
	Cohesion Intercept, kPa *2		-	-							
	Condition of drainage		-	-							
Consolidation Test	Preconsolidation Pressure,	kPa	-	-							
	Compression Index(Average)		-	-							
	Pressure Range for Compression Index(kPa)		-	-							
	Swell index		-	-							
Chemical Test	pH value		-	-							
	Total sulphate content as SO_3,	%	-	-							
	Chloride content as Cl,	%	-	-							
	Organic Matter content,	%	-	-							
Unconfined Compression Strength (kPa)			-	-							
Strain at failure (%)			-	-							

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **11.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

Sample No. : **OF-03-1a D-1** Depth : **4.00-4.80m** (_____) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.4	34.3	25.9
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	23.8	22.6	21.4	19.5	18.1	17.1	14.0	12.4							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves

Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-03-1a D-1 4.00-4.80m			Sample No. Depth	OF-03-1a D-1 4.00-4.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.15	mm
2.00 - 0.425 mm	0.2	%		Dia. at 30%	0.089	mm
0.425 - 0.075 mm	73.9	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	9.9	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	16.0	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	25.9	%				

Kiso-Jiban Consultants Co., Ltd.

21

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **11.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

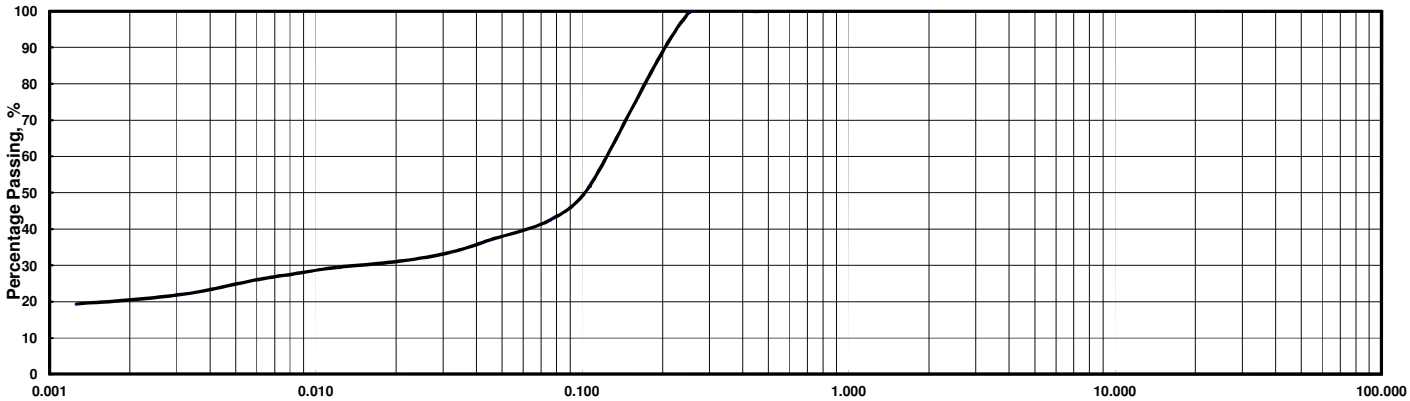
Sample No. : **OF-03-1a D-2** Depth : **7.00-7.80m** (_____) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.4	51.6	42.4
Hydro.	Dia., mm	0.045	0.032	0.021	0.012	0.0085	0.0060	0.0031	0.0013							
	% Passing	37.0	33.7	31.1	29.5	27.8	26.1	21.9	19.4							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-03-1a D-2 7.00-7.80m			Sample No. Depth	OF-03-1a D-2 7.00-7.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.12	mm
2.00 - 0.425 mm	0.1	%		Dia. at 30%	0.014	mm
0.425 - 0.075 mm	57.5	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	17.7	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	24.6	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	42.4	%				

Kiso-Jiban Consultants Co., Ltd.

22

4) OF-03-1b

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			**OF-03-1b**							
Sample No.		D-1	D-2	D-3						
Sample Depth		2.00m ~2.80m	5.00m ~5.80m	8.00m ~8.80m						
Condition of Sample			Disturbed							
Natural Water Content	%	25.9	28.6	24.4						
Specific Gravity		2.70	2.70	2.69						
Wet Density	Mg/m^3	2.05	1.87	-						
Dry Density	Mg/m^3	1.63	1.45							
Natural Void Ratio		0.66	0.86							
Degree of Saturation	%	100	90							
Atterberg Limits	Liquid Limit, %	- *3	- *3	- *3						
	Plastic Limit, %	- *3	- *3	- *3						
	Plasticity Index, %	- *3	- *3	- *3						
Grain Size Analysis	Gravel, %	0	0	0						
	Sand, %	67	70	64						
	Silt, %	13	9	18						
	Clay & Colloid, %	20	21	18						
	Max. diameter, mm	0.850	0.850	4.75						
	Diam. at 60% mm	0.15	0.15	0.13						
	Diam. at 10% mm	-	-	-						
Visual soil description		Clayey Sand	Clayey Sand	Clayey Sand						
Unified soil classification		-	-	-						
Triaxial compression test	Angle of Internal Friction (^{0})	-	-							
	Cohesion Intercept, kPa	-	-							
	Condition of drainage	-	-							
	Angle of Internal Friction *2 (^{0})	-	-							
	Cohesion Intercept, kPa *2	-	-							
	Condition of drainage	-	-							
Consolidation Test	Preconsolidation Pressure, kPa	-	-							
	Compression Index(Average)	-	-							
	Pressure Range for Compression Index(kPa)	-	-							
	Swell index	-	-							
Chemical Test	pH value	-	-							
	Total sulphate content as SO_3, %	-	-							
	Chloride content as Cl, %	-	-							
	Organic Matter content, %	-	-							
Unconfined Compression Strength (kPa)		-	-							
Strain at failure (%)		-	-							

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **11.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

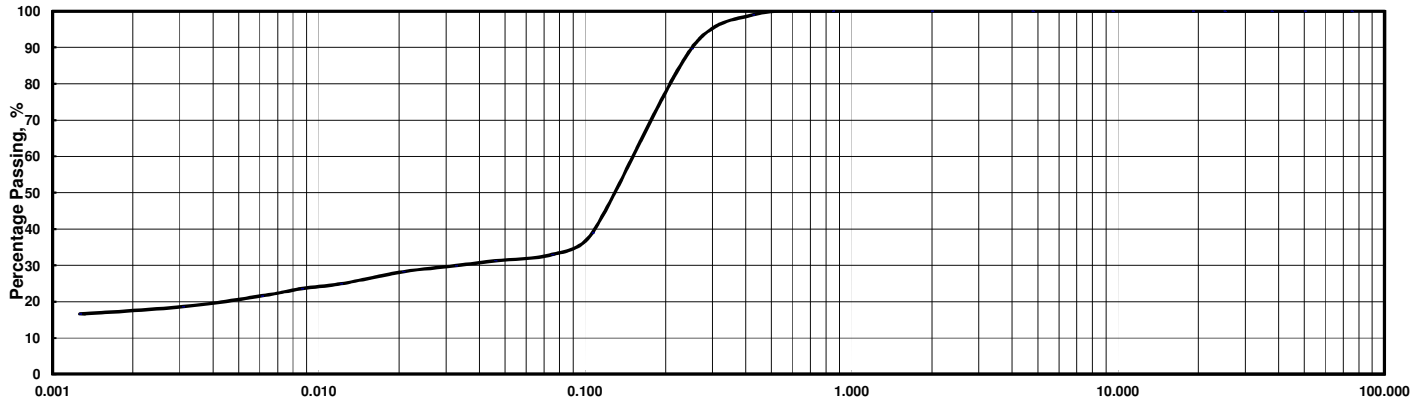
Sample No. : **OF-03-1b D-1** Depth : **2.00-2.80m** (_____) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.0	89.7	38.9	33.0
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	31.2	29.9	28.2	24.9	23.6	21.6	18.6	16.6							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

Sample No. Depth	OF-03-1b D-1 2.00-2.80m		Sample No. Depth	OF-03-1b D-1 2.00-2.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.15 mm	
2.00 - 0.425 mm	1.0 %		Dia. at 30%	0.033 mm	
0.425 - 0.075 mm	66.0 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	12.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	20.5 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	33.0 %				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **11.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

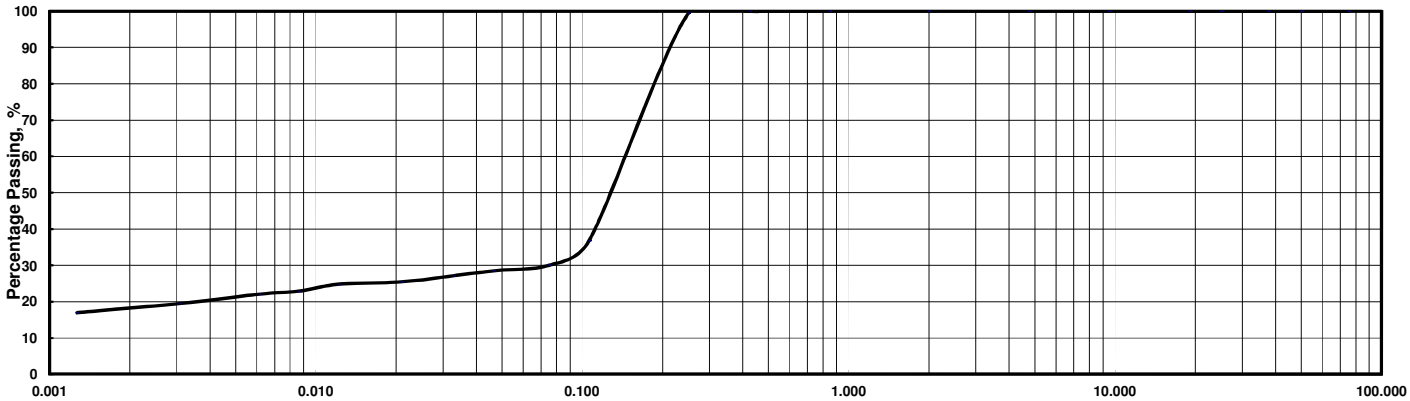
Sample No. : **OF-03-1b D-2** Depth : **5.00-5.80m** ( ) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.5	36.8	30.0
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	28.5	27.2	25.5	24.8	22.9	22.1	19.5	17.0							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-03-1b D-2 5.00-5.80m			Sample No. Depth	OF-03-1b D-2 5.00-5.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.15	mm
2.00 - 0.425 mm	0.1	%		Dia. at 30%	0.074	mm
0.425 - 0.075 mm	69.9	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	8.9	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	21.1	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	30.0	%				

Kiso-Jiban Consultants Co., Ltd.

26

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **11.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

Sample No. : **OF-03-1b D-3** Depth : **8.00-8.80m** (_____) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.8	99.3	89.6	50.9	36.6
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0087	0.0062	0.0031	0.0013							
	% Passing	31.7	29.1	25.6	22.2	20.4	19.0	17.6	15.0							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves

Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-03-1b D-3 8.00-8.80m			Sample No. Depth	OF-03-1b D-3 8.00-8.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm
4.75 - 2.00 mm	0.1	%		Dia. at 60%	0.13	mm
2.00 - 0.425 mm	0.6	%		Dia. at 30%	0.037	mm
0.425 - 0.075 mm	62.8	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	18.1	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	18.5	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.8	%				
75um Sieve Passing	36.6	%				

Kiso-Jiban Consultants Co., Ltd.

27

28

5) OF-03-1c

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			**OF-03-1c**
Sample No.			D-1
Sample Depth			1.00m ~1.90m
Condition of Sample			Disturbed
Natural Water Content		%	22.4
Specific Gravity			2.70
Wet Density		Mg/m^3	2.00
Dry Density		Mg/m^3	1.63
Natural Void Ratio			0.65
Degree of Saturation		%	93
Atterberg Limits	Liquid Limit,	%	- *3
	Plastic Limit,	%	- *3
	Plasticity Index,	%	- *3
Grain Size Analysis	Gravel,	%	0
	Sand,	%	68
	Silt,	%	11
	Clay & Colloid,	%	21
	Max. diameter,	mm	0.850
	Diam. at 60%	mm	0.17
	Diam. at 10%	mm	-
Visual soil description			Clayey Sand
Unified soil classification			-
Triaxial compression test	Angle of Internal Friction	(^{0})	-
	Cohesion Intercept, kPa		-
	Condition of drainage		-
	Angle of Internal Friction *2	(^{0})	36
	Cohesion Intercept, kPa *2		0
	Condition of drainage		CD*5
Consolidation Test	Preconsolidation Pressure,	kPa	-
	Compression Index(Average)		-
	Pressure Range for Compression Index(kPa)		-
	Swell index		-
Compaction Test *4	Maximum Dry Density, Mg/m^3		1.73
	Optimum Moisture Content , %		14.4
Unconfined Compression Strength (kPa)			-
Strain at failure (%)			-

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

*4 : By using 2.5 kg Rammer *5 : Specimens are prepared at 90% of Maximum dry density Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

30

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **13.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

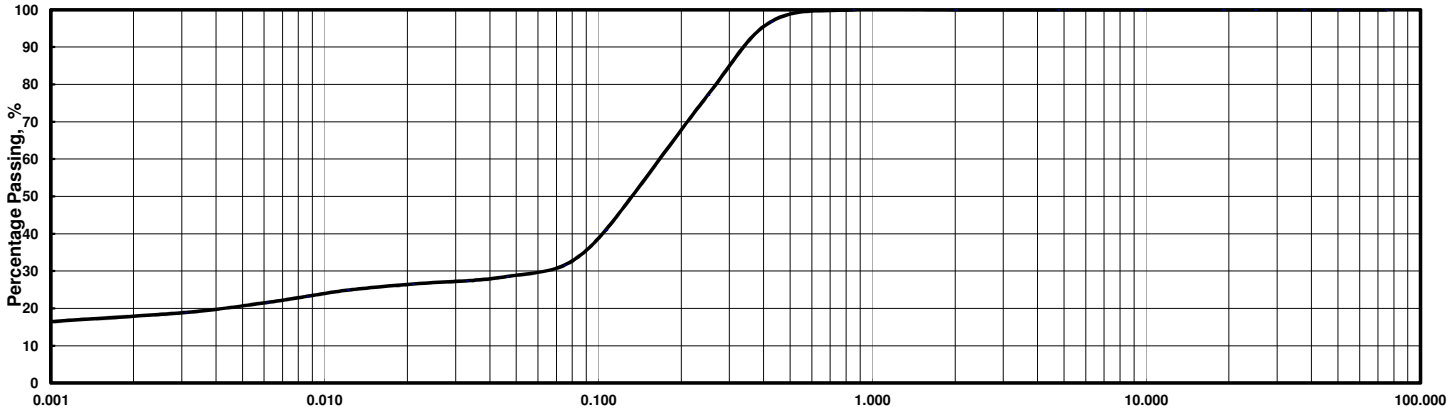
Sample No. : **OF-03-1C D-1** Depth : **1.00-1.90m** ( ) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96.8	77.1	41.0	31.6
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0009							
	% Passing	28.5	27.4	26.6	24.9	23.2	21.6	18.9	16.3							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-03-1C D-1 1.00-1.90m		Sample No. Depth	OF-03-1C D-1 1.00-1.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.17 mm	
2.00 - 0.425 mm	3.2 %		Dia. at 30%	0.058 mm	
0.425 - 0.075 mm	65.2 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	11.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	20.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	31.6 %				

Summary of Consolidated Drained Triaxial Compression Test

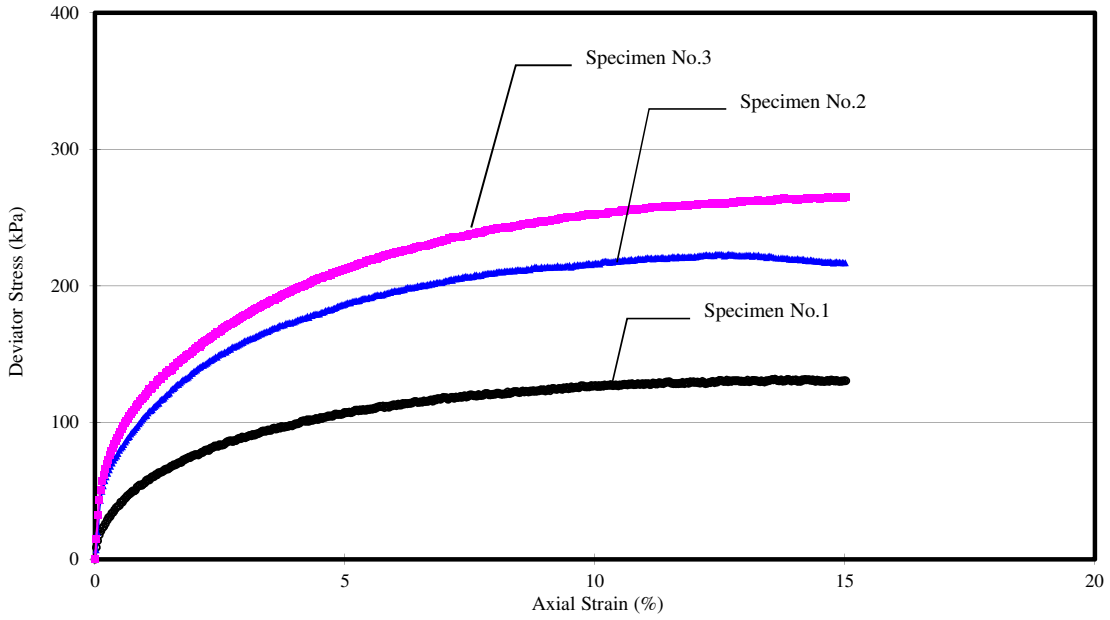
Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 06.12.14		Tested by : Perera		Checked by : A. B. Tan			
Borehole No.: OF-03-1c		Sample No.:D-1		Depth : 1.00-1.90m			
Specimen Condition : Remoulded		Test Method : ASTM D7181-11					
Soil Description : Clayey Sand		Ave. Diameter : 50.0mm		Ave. Height : 100.0mm			
Specimen No.			1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.56	1.56	1.56		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	570	600		
	B-value		0.96	0.98	0.95		
Consolidation Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	529	559	586		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.07	0.08	0.13		
	Coefficient of Consolidation Cv,	m^2/year	571	311	288		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.018	0.012	0.013		
Compression Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	132	223	265		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	0.87	1.36	1.61		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	13.60	12.68	15.02		
Shear Strength Parameters	ϕ_d = 36 Degree c_d = 0 kPa		Mode of Failure				
			1	2	3	4	

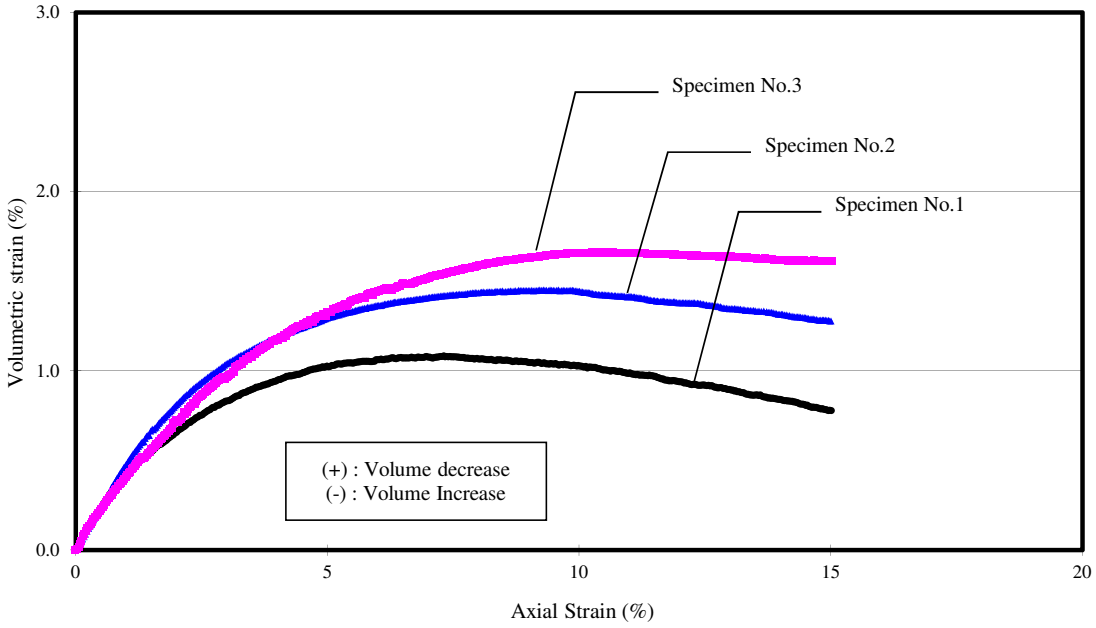
Remarks :

Specimens are prepared at 90% of Maximum dry density (from compaction Test) = 1.56 Mg/m^3

Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-1 Soil Type: Clayey Sand
Borehole No.: OF-03-1c Depth : 1.00-1.90m





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

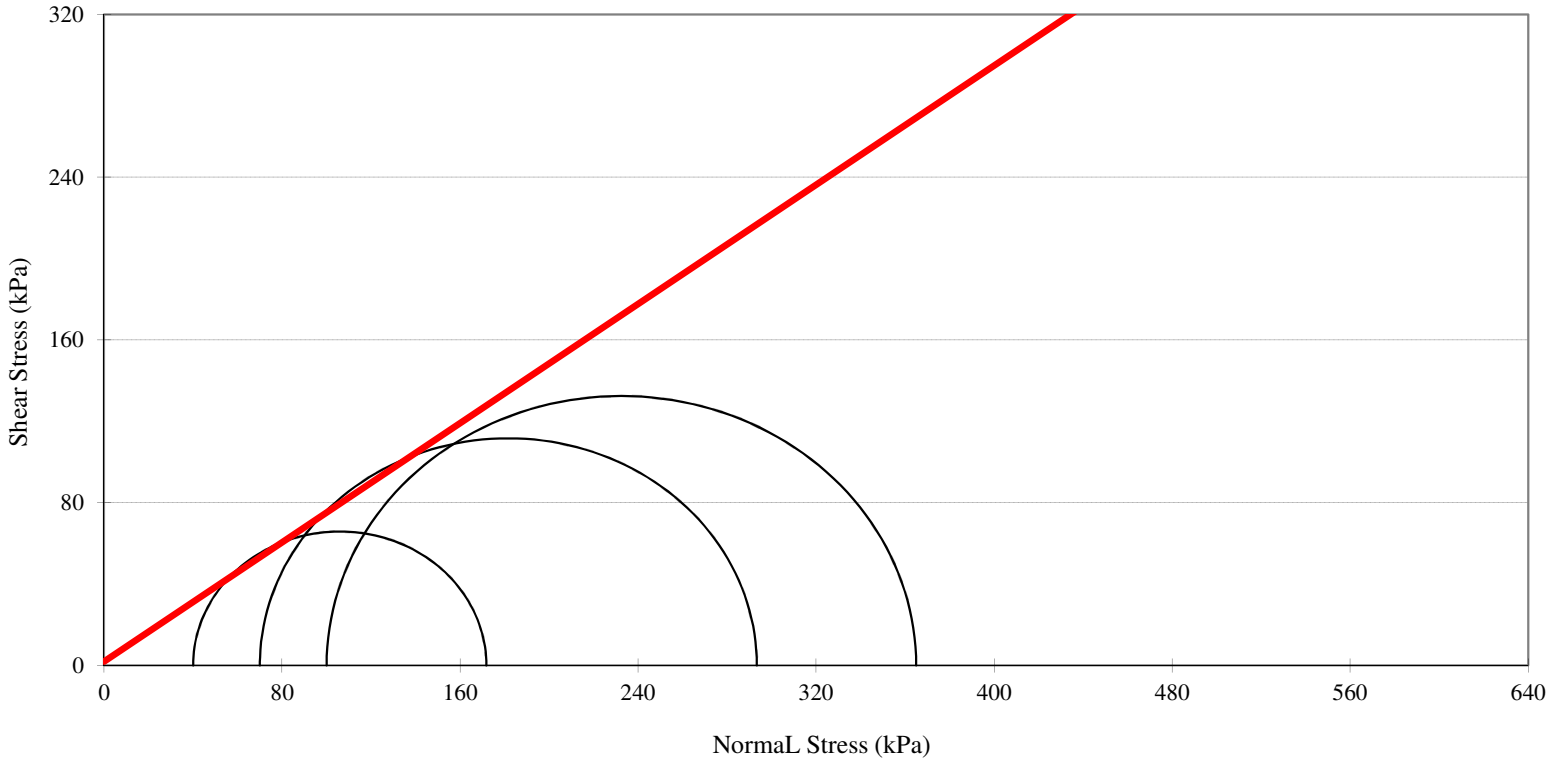
Project No. : S27-14

Borehole No. : OF-03-1c Soil Type: Clayey Sand

Sample No. : D-1 Depth : 1.00-1.90m

Angle of Internal Friction, ϕ_d 36 deg

Cohesion, c_d 0 kPa



Kiso-Jiban Consultants Co., Ltd.

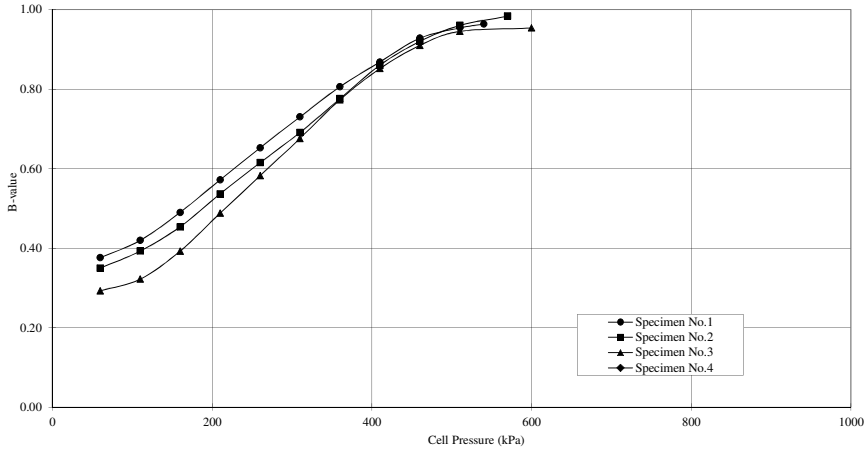
34

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: OF-03-1c
Sample No.: D-1

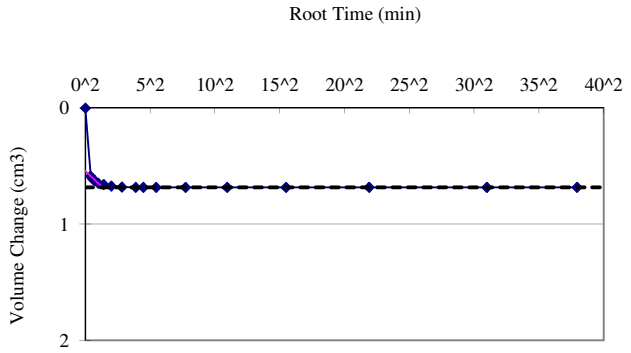
Depth : 1.00-1.90m
Soil Type: Clayey Sand

		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	31.3	20	30.5	20	28.8		
	Back Pressure (kPa)	20		20		20			
	B-value	0.38		0.35		0.29			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	71.0	50	69.6	50	66.1		
	Back Pressure (kPa)	50		50		50			
	B-value	0.42		0.39		0.32			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	124.5	100	122.7	100	119.6		
	Back Pressure (kPa)	100		100		100			
	B-value	0.49		0.45		0.39			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	178.6	150	176.8	150	174.4		
	Back Pressure (kPa)	150		150		150			
	B-value	0.57		0.54		0.49			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	232.6	200	230.7	200	229.1		
	Back Pressure (kPa)	200		200		200			
	B-value	0.65		0.61		0.58			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	286.5	250	284.5	250	283.8		
	Back Pressure (kPa)	250		250		250			
	B-value	0.73		0.69		0.68			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	340.3	300	338.8	300	338.7		
	Back Pressure (kPa)	300		300		300			
	B-value	0.81		0.78		0.77			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	393.4	350	393.0	350	392.6		
	Back Pressure (kPa)	350		350		350			
	B-value	0.87		0.86		0.85			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	446.4	400	446.0	400	445.5		
	Back Pressure (kPa)	400		400		400			
	B-value	0.93		0.92		0.91			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	497.7	450	498.0	450	497.3		
	Back Pressure (kPa)	450		450		450			
	B-value	0.95		0.96		0.95			
B-check Step.11	Cell Pressure (kPa)	510	540	510	570	510	600		
	P.W.P (kPa)	500	528.9	500	559.0	500	585.8		
	Back Pressure (kPa)	500		500		500			
	B-value	0.96		0.98		0.95			



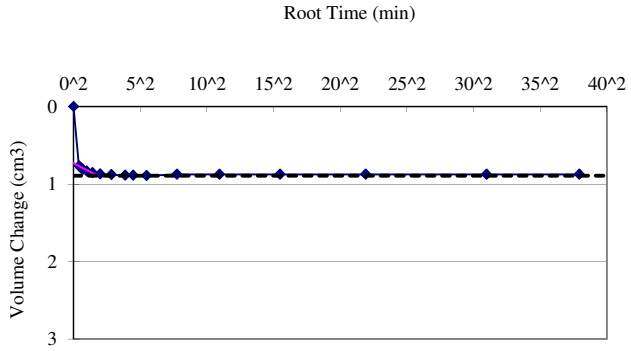
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: OF-03-1c Soil Type: Clayey Sand
Sample No.: D-1 Depth : 1.00-1.90m



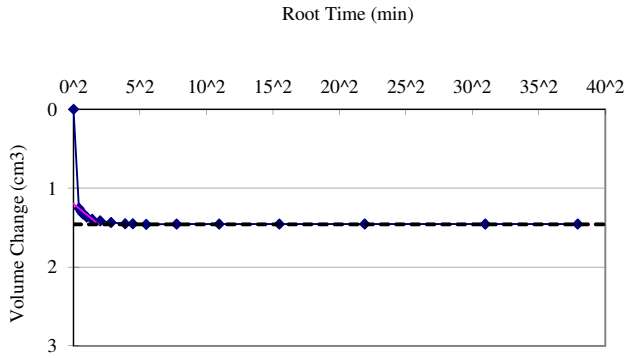
Specimen No.: 1

p' =	40	kPa
t100 =	1.8	min
Cv =	571	m^2/year
mvi=	0.018	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	3.3	min
Cv =	311	m^2/year
mvi=	0.012	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	3.6	min
Cv =	288	m^2/year
mvi=	0.013	m^2/MN

RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

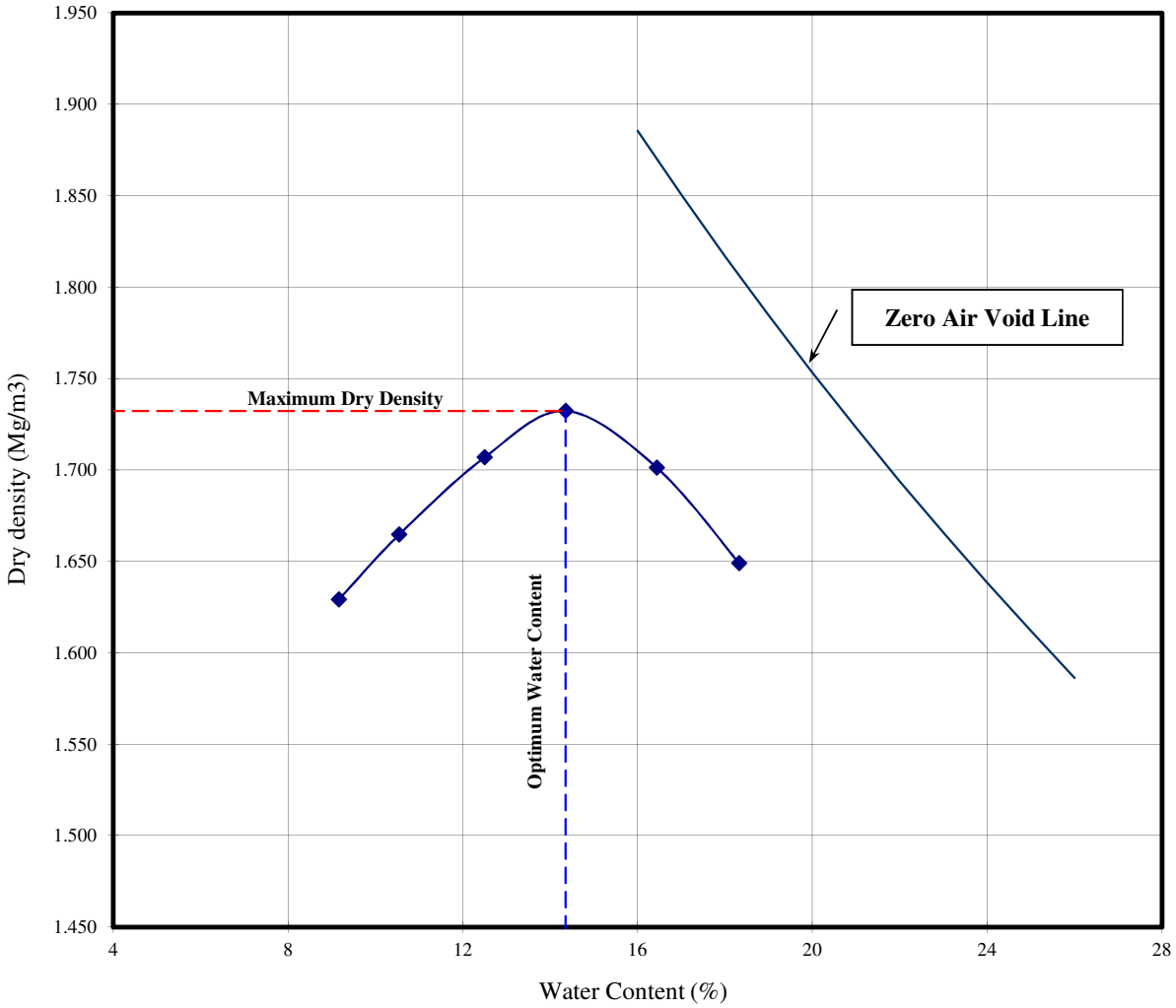
Sampling Date : - **Date of Testing :** 24-Nov-14 **Tested by :** Perera/Bala

Sample No. : OF-03-1c D-1(1.00-1.90m) **Ref. No.** -

Soil Type :	Clayey Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.70	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	9.2	10.5	12.5	14.4	16.4	18.3		
Wet Density (Mg/m3)	1.778	1.840	1.920	1.981	1.981	1.951		
Dry Density (Mg/m3)	1.629	1.665	1.707	1.732	1.701	1.649		

Maximum Dry Density	**1.732 Mg/m3**
Optimum Water Content	**14.4 %**



37

38

6) OF-04-1

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			OF-04-1								
Sample No.			D-1	D-2	HP-1	D-3					
Sample Depth			1.00m ~1.90m	5.00m ~5.90m	8.00m ~8.90m	11.00m ~11.90m					
Condition of Sample			Disturbed		Undisturbed	Disturbed					
Natural Water Content		%	26.8	22.5	34.7	26.6					
Specific Gravity			2.69	2.70	2.73	2.70					
Wet Density		Mg/m^3	1.91	2.12	1.89	1.91					
Dry Density		Mg/m^3	1.51	1.73	1.40	1.51					
Natural Void Ratio			0.78	0.56	0.95	0.79					
Degree of Saturation		%	92	100	100	91					
Atterberg Limits	Liquid Limit,	%	- *3	- *3	31	23					
	Plastic Limit,	%	- *3	- *3	18	16					
	Plasticity Index,	%	- *3	- *3	13	7					
Grain Size Analysis	Gravel,	%	0	0	0	0					
	Sand,	%	70	66	25	47					
	Silt,	%	19	11	38	26					
	Clay & Colloid,	%	11	23	37	27					
	Max. diameter,	mm	0.425	4.75	0.425	2.00					
	Diam. at 60%	mm	0.10	0.26	0.027	0.11					
	Diam. at 10%	mm	-	-	-	-					
Visual soil description			Silty Sand	Clayey Sand	Clay with Sand	Sandy Silty Clay					
Unified soil classification			-	-	CL	CL-ML					
Triaxial compression test	Angle of Internal Friction	(^{0})	-	-	-	-					
	Cohesion Intercept, kPa		-	-	-	-					
	Condition of drainage		-	-	-	-					
	Angle of Internal Friction *2	(^{0})	-	-	-	-					
	Cohesion Intercept, kPa *2		-	-	-	-					
	Condition of drainage		-	-	-	-					
Consolidation Test	Preconsolidation Pressure,	kPa	-	-	-	-					
	Compression Index(Average)		-	-	-	-					
	Pressure Range for Compression Index(kPa)		-	-	-	-					
	Swell index		-	-	-	-					
Chemical Test	pH value		-	-	-	-					
	Total sulphate content as SO_3,	%	-	-	-	-					
	Chloride content as Cl,	%	-	-	-	-					
	Organic Matter content,	%	-	-	-	-					
Unconfined Compression Strength (kPa)			-	-	-	-					
Strain at failure (%)			-	-	-	-					

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No. : S27-14

Standard : ASTM D4318-10

Date of Testing : 13.12.14

Tested By : Vasantha

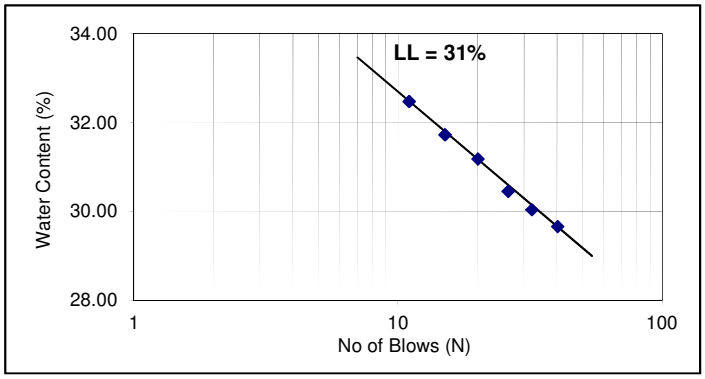
Checked By : A. B. Tan

Sample No. : OF-04-1 HP-1

Depth : 8.00-8.90m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	40	29.66
2	32	30.03
3	26	30.45
4	20	31.18
5	15	31.72
6	11	32.47
Liquid Limits %		**31**
Plastic Limits %		**8**
Plasticity Index		**23**



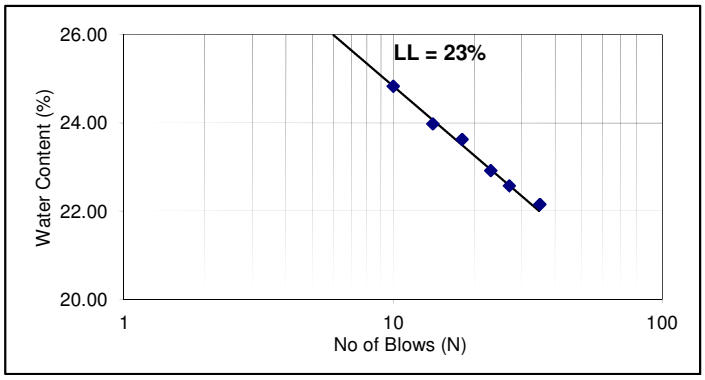
Sample No. : OF-04-1 HP-1

Depth : 11.00-11.90m

Remarks : * Tested on wet sieved material passing 0.425mm sieve

Material passing through 0.425mm sieve : 72.6 %

Liquid Limits Test		
Test No.	Blows	Wn
1	35	22.15
2	27	22.58
3	23	22.92
4	18	23.62
5	14	23.98
6	10	24.83
Liquid Limits %		**23**
Plastic Limits %		**16**
Plasticity Index		**7**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **11.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

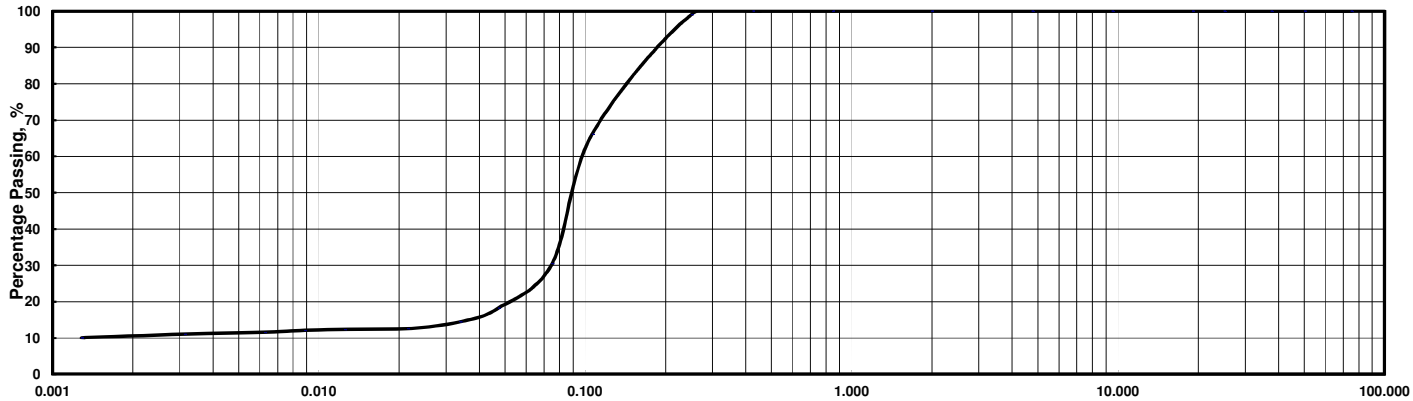
Sample No. : **OF-04-1 D-1** Depth : **1.00-1.90m** (_____) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.0	66.1	30.5
Hydro.	Dia., mm	0.047	0.034	0.022	0.012	0.0088	0.0063	0.0031	0.0013							
	% Passing	18.2	14.5	12.6	12.3	12.1	11.6	11.1	10.1							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE / COARSE		
		SAND		GRAVEL		

Sample No. Depth	OF-04-1 D-1 1.00-1.90m		Sample No. Depth	OF-04-1 D-1 1.00-1.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.10 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.074 mm	
0.425 - 0.075 mm	69.5 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	19.1 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	11.4 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	30.5 %				

Kiso-Jiban Consultants Co., Ltd.

42

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **11.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

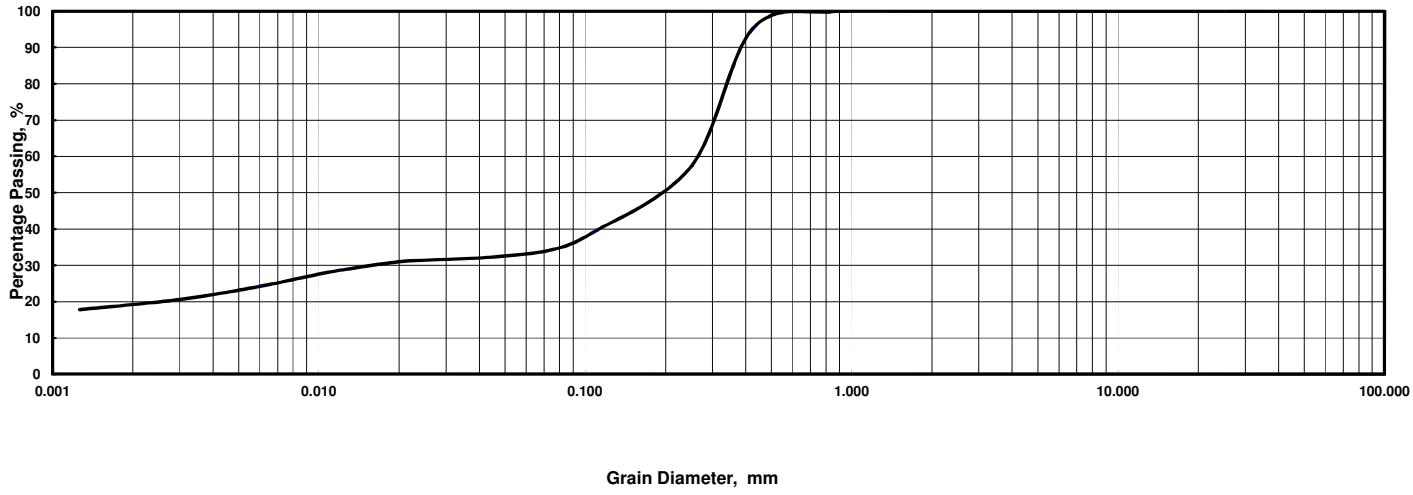
Sample No. : **OF-04-1 D-2** Depth : **5.00-5.90m** (_____) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	95.2	57.4	38.9	34.3
Hydro.	Dia., mm	0.046	0.032	0.020	0.012	0.0085	0.0060	0.0031	0.0013							
	% Passing	32.3	31.7	31.1	28.6	26.5	24.3	20.7	17.8							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-04-1 D-2 5.00-5.90m			Sample No. Depth	OF-04-1 D-2 5.00-5.90m	
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.26	mm
2.00 - 0.425 mm	4.8	%		Dia. at 30%	0.016	mm
0.425 - 0.075 mm	60.9	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	11.3	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	23.0	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.8	%				
75um Sieve Passing	34.3	%				

Kiso-Jiban Consultants Co., Ltd.

43

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **11.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

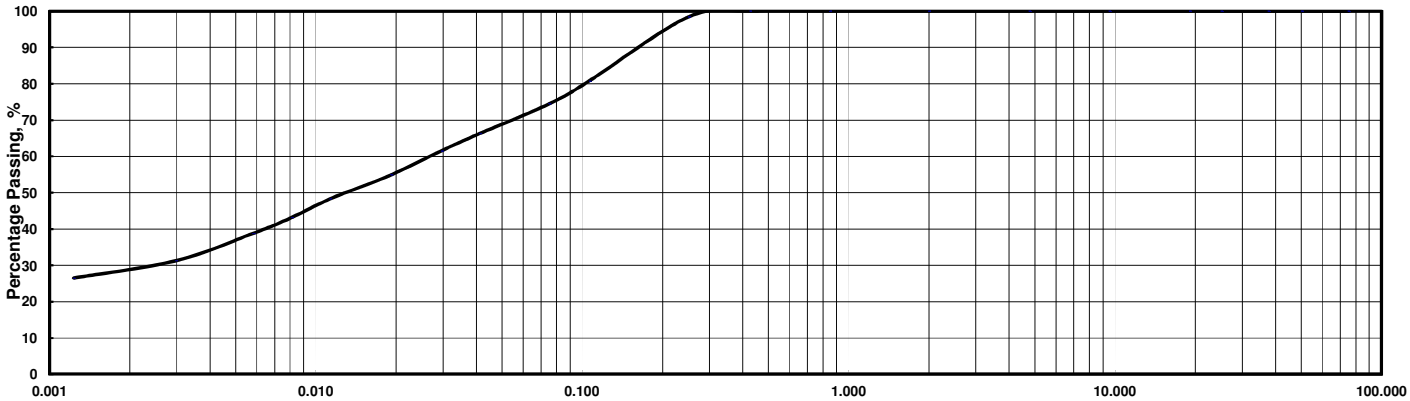
Sample No. : **OF-04-1 HP-1** Depth : **8.00-8.90m** (_____) Specific Gravity : 2.73

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.4	80.8	74.4
Hydro.	Dia., mm	0.041	0.030	0.019	0.011	0.0081	0.0058	0.0030	0.0012							
	% Passing	66.3	61.6	54.9	48.3	43.2	38.8	31.2	26.5							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-04-1 HP-1 8.00-8.90m		Sample No. Depth	OF-04-1 HP-1 8.00-8.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.027 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.0024 mm	
0.425 - 0.075 mm	25.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	37.8 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	36.7 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	74.4 %				

Kiso-Jiban Consultants Co., Ltd.

44

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **11.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

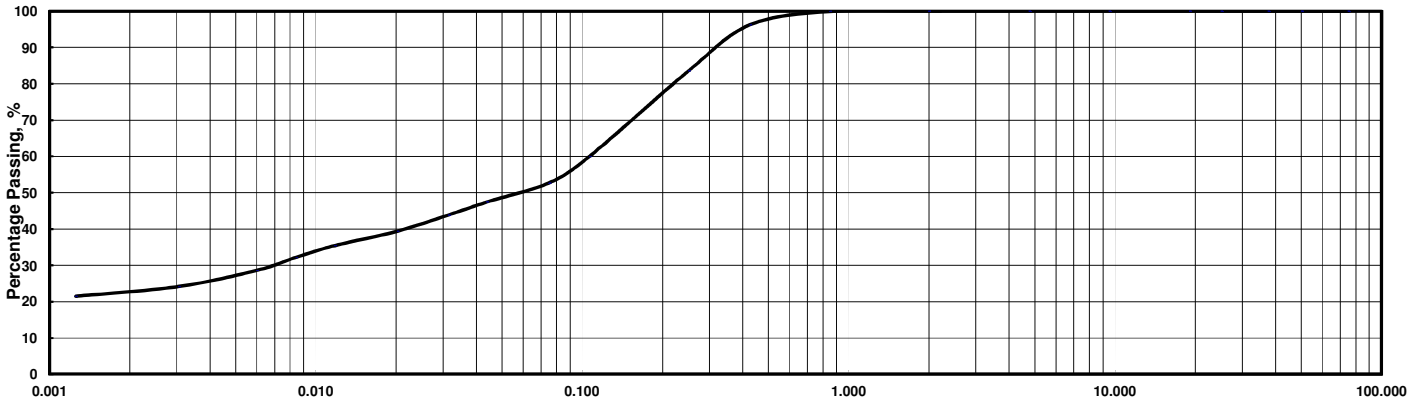
Sample No. : **OF-04-1 D-3** Depth : **11.00-11.90m** (_____) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	96.2	83.5	59.9	52.7
Hydro.	Dia., mm	0.044	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0013							
	% Passing	47.4	43.9	39.4	35.5	32.2	28.6	24.2	21.5							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-04-1 D-3 11.00-11.90m		Sample No. Depth	OF-04-1 D-3 11.00-11.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.11 mm	
2.00 - 0.425 mm	3.8 %		Dia. at 30%	0.0068 mm	
0.425 - 0.075 mm	43.5 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	25.6 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	27.1 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.9 %				
75um Sieve Passing	52.7 %				

Kiso-Jiban Consultants Co., Ltd.

7) OF-04-2

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			OF-04-2								
Sample No.			D-1	D-2	D-3	D-4	D-5				
Sample Depth			2.00m ~2.80m	5.00m ~5.80m	8.00m ~8.78m	14.00m ~14.95m	18.00m ~18.95m				
Condition of Sample			Disturbed								
Natural Water Content		%	21.1	21.3	24.0	28.4	19.0				
Specific Gravity			2.69	2.69	2.68	2.72	2.68				
Wet Density		Mg/m^3	-	-	1.93	1.90	2.01				
Dry Density		Mg/m^3	-	-	1.55	1.48	1.69				
Natural Void Ratio			-	-	0.73	0.84	0.59				
Degree of Saturation		%	-	-	89	92	87				
Atterberg Limits	Liquid Limit,	%	- *3	- *3	- *3	- *3	- *3				
	Plastic Limit,	%	- *3	- *3	- *3	- *3	- *3				
	Plasticity Index,	%	- *3	- *3	- *3	- *3	- *3				
Grain Size Analysis	Gravel,	%	0	0	0	0	0				
	Sand,	%	88	81	62	13	78				
	Silt,	%	2	8	17	57	8				
	Clay & Colloid,	%	10	11	21	30	14				
	Max. diameter,	mm	0.850	2.00	4.75	4.75	4.75				
	Diam. at 60%	mm	0.17	0.15	0.18	0.033	0.27				
	Diam. at 10%	mm	0.0042	0.0025	-	-	-				
Visual soil description			Clayey Sand	Clayey Sand	Clayey Sand	Silt with Sand	Clayey Sand				
Unified soil classification			-	-	-	-	-				
Triaxial compression test	Angle of Internal Friction	(^{0})	-	-	-	-					
	Cohesion Intercept, kPa		-	-	-	-					
	Condition of drainage		-	-	-	-					
	Angle of Internal Friction *2	(^{0})	-	36	-	-					
	Cohesion Intercept, kPa *2		-	0	-	-					
	Condition of drainage		-	CD*5	-	-					
Consolidation Test	Preconsolidation Pressure,	kPa	-	-	-	-					
	Compression Index(Average)		-	-	-	-					
	Pressure Range for Compression Index(kPa)		-	-	-	-					
	Swell index		-	-	-	-					
Compaction Test *4	Maximum Dry Density, Mg/m^3		-	1.64	-	-					
	Optimum Moisture Content , %		-	15.7	-	-					
Unconfined Compression Strength (kPa)			-	-	-	-					
Strain at failure (%)			-	-	-	-					

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

*4 : By using 2.5 kg Rammer *5 : Specimens are prepared at 90% of Maximum dry density

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

48

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

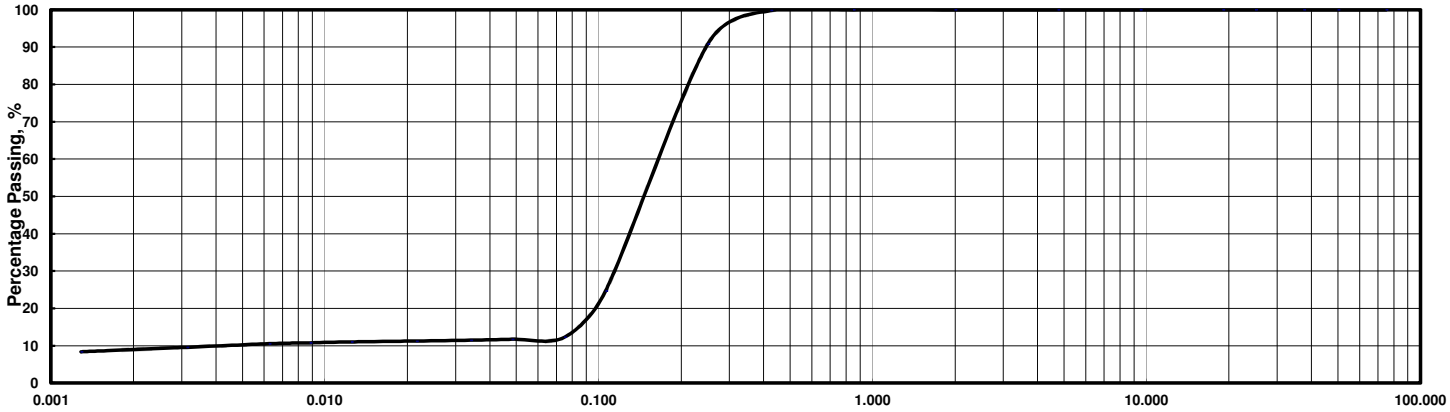
Sample No. : **OF-04-2 D-1** Depth : **2.00-2.80m** ( ) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	90.8	24.7	12.3
Hydro.	Dia., mm	0.048	0.034	0.022	0.012	0.0088	0.0062	0.0031	0.0013							
	% Passing	11.7	11.5	11.3	11.0	10.8	10.5	9.6	8.4							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-04-2 D-1 2.00-2.80m		Sample No. Depth	OF-04-2 D-1 2.00-2.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.17 mm	
2.00 - 0.425 mm	0.2 %		Dia. at 30%	0.11 mm	
0.425 - 0.075 mm	87.5 %		Dia. at 10%	0.0042 mm	
0.075 - 0.005 mm	2.1 %		Coeff. of Uniformity	39.9	
Smaller than 0.005 mm	10.2 %		Coeff. of Curvature	18.3	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	12.3 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

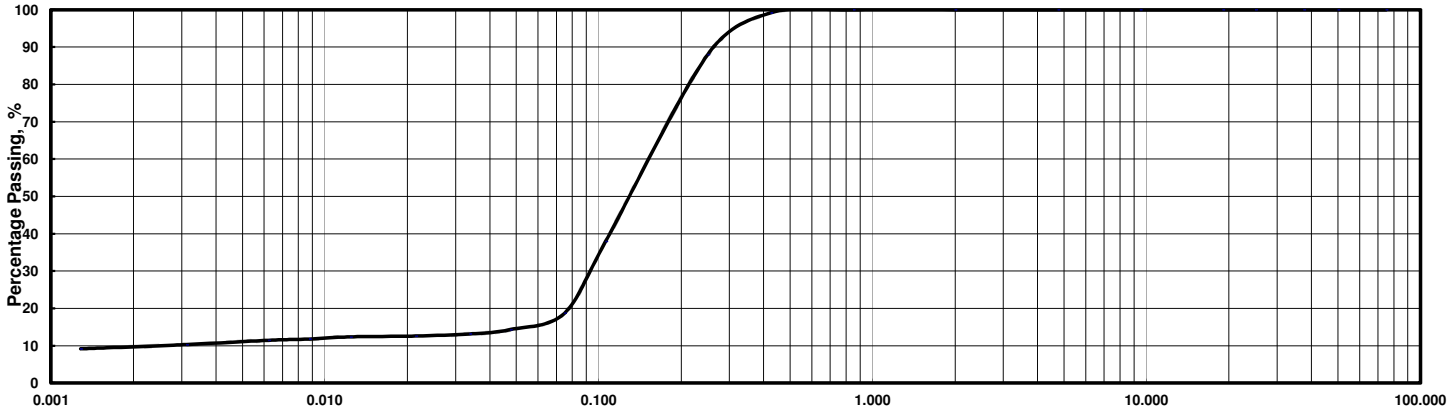
Sample No. : **OF-04-2 D-2** Depth : **5.00-5.80m** ( ) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	88.0	38.0	18.7
Hydro.	Dia., mm	0.048	0.034	0.021	0.012	0.0088	0.0062	0.0031	0.0013							
	% Passing	14.3	13.2	12.6	12.4	11.8	11.5	10.3	9.2							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-04-2 D-2 5.00-5.80m			Sample No. Depth	OF-04-2 D-2 5.00-5.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.15	mm
2.00 - 0.425 mm	0.8	%		Dia. at 30%	0.092	mm
0.425 - 0.075 mm	80.4	%		Dia. at 10%	0.0025	mm
0.075 - 0.005 mm	7.7	%		Coeff. of Uniformity	61.9	
Smaller than 0.005 mm	11.0	%		Coeff. of Curvature	21.8	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	18.7	%				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

Sample No. : **OF-04-2 D-3** Depth : **8.00-8.78m** ( ) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.0	93.6	68.9	44.3	38.0
Hydro.	Dia., mm	0.045	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	34.0	30.8	27.7	25.0	23.4	21.8	19.0	16.6							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves

Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-04-2 D-3 8.00-8.78m			Sample No. Depth	OF-04-2 D-3 8.00-8.78m		
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.18	mm	
2.00 - 0.425 mm	6.4	%		Dia. at 30%	0.029	mm	
0.425 - 0.075 mm	55.6	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	17.2	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	20.7	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.0	%					
75um Sieve Passing	38.0	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

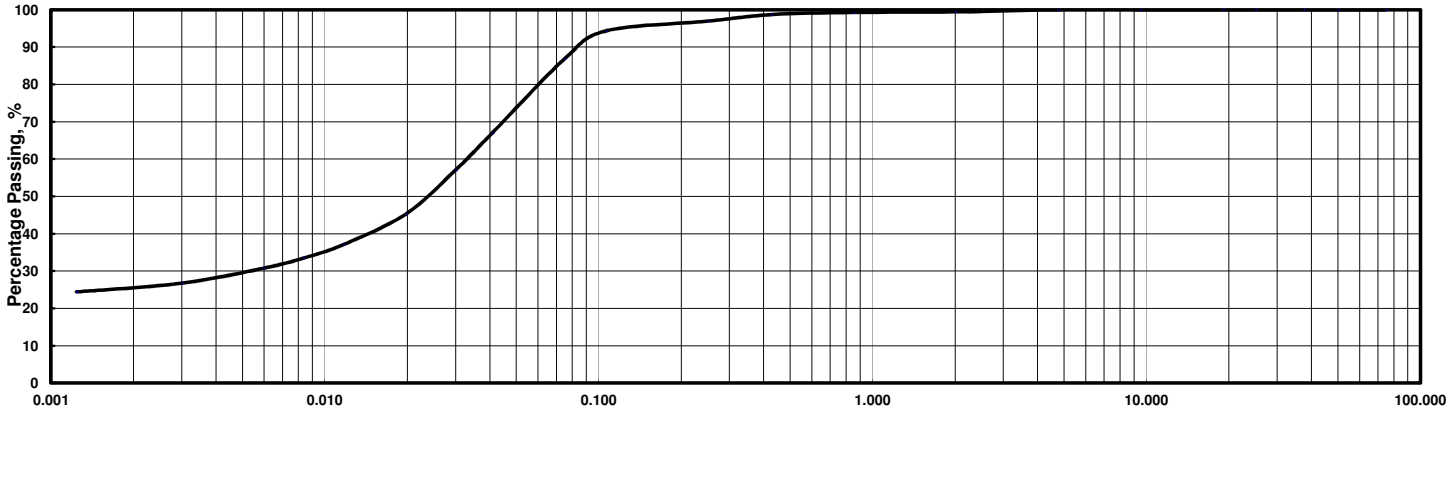
Sample No. : **OF-04-2 D-4** Depth : **14.00-14.95m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	99.2	98.7	96.9	94.3	86.8
Hydro.	Dia., mm	0.041	0.030	0.020	0.012	0.0083	0.0060	0.0030	0.0012							
	% Passing	66.9	57.0	45.2	37.1	33.5	30.7	26.8	24.4							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-04-2 D-4 14.00-14.95m			Sample No. Depth	OF-04-2 D-4 14.00-14.95m		
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm	
4.75 - 2.00 mm	0.6	%		Dia. at 60%	0.033	mm	
2.00 - 0.425 mm	0.8	%		Dia. at 30%	0.0052	mm	
0.425 - 0.075 mm	11.8	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	57.4	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	29.5	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.2	%					
75um Sieve Passing	86.8	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

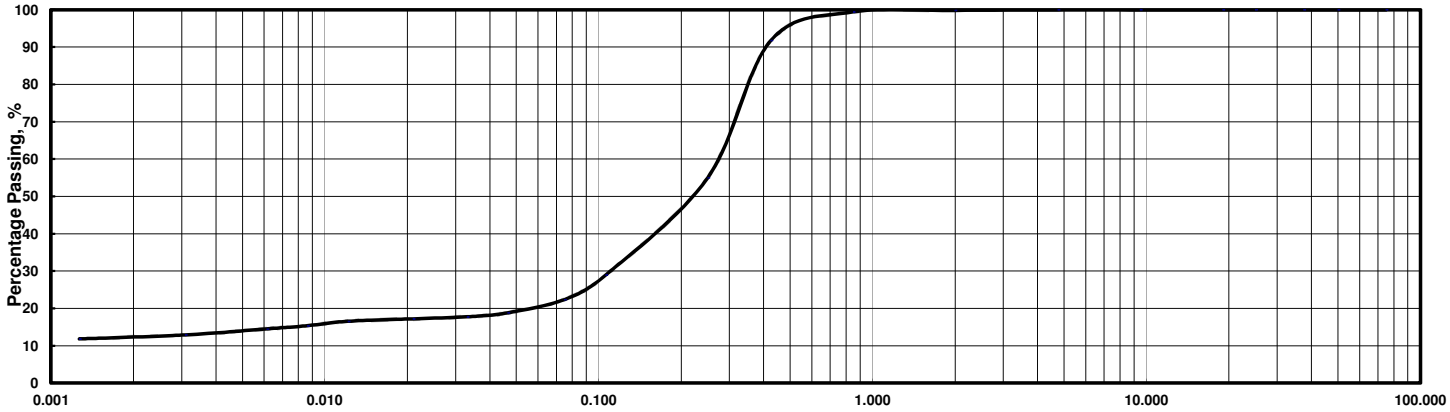
Sample No. : **OF-04-2 D-5** Depth : **18.00-18.95m** ( ) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.4	91.8	55.0	28.9	22.4
Hydro.	Dia., mm	0.047	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	18.8	17.7	17.2	16.6	15.4	14.5	12.9	11.8							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-04-2 D-5 18.00-18.95m			Sample No. Depth	OF-04-2 D-5 18.00-18.95m	
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm
4.75 - 2.00 mm	0.2	%		Dia. at 60%	0.27	mm
2.00 - 0.425 mm	8.0	%		Dia. at 30%	0.11	mm
0.425 - 0.075 mm	69.4	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	8.5	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	13.9	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.4	%				
75um Sieve Passing	22.4	%				

Summary of Consolidated Drained Triaxial Compression Test

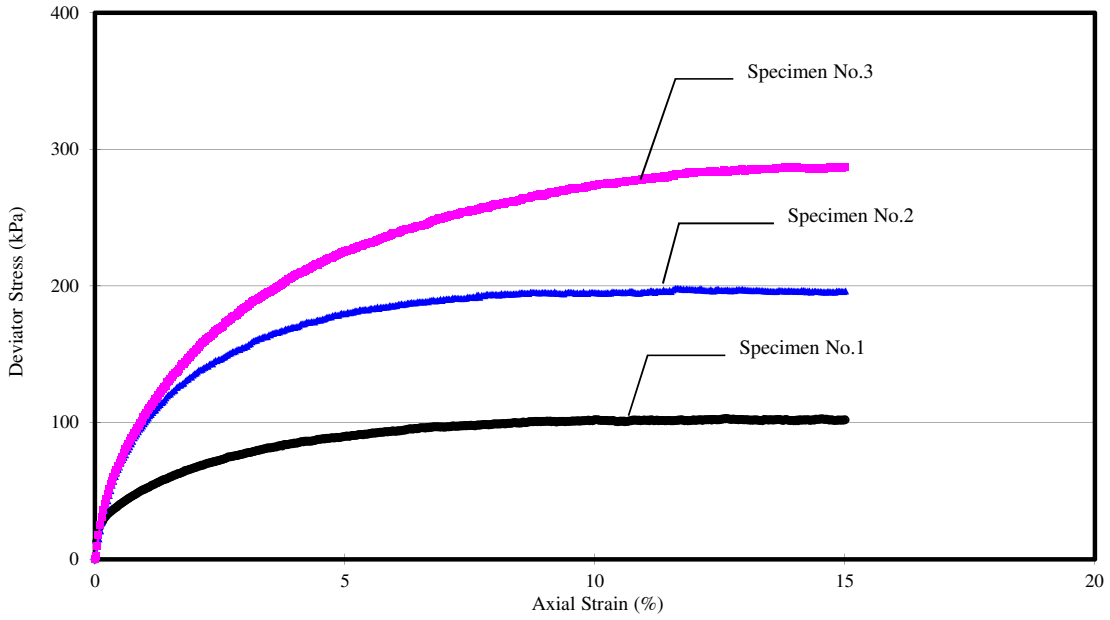
Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 08.12.14		Tested by : Rahim		Checked by : A. B. Tan			
Borehole No.: OF-04-02		Sample No.:D-2		Depth : 5.00-5.80m			
Specimen Condition : Remoulded		Test Method : ASTM D7181-11					
Soil Description : Clayey Sand		Ave. Diameter : 50.0mm		Ave. Height : 100.0mm			
Specimen No.			1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.48	1.48	1.48		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	570	600		
	B-value		0.95	0.96	0.96		
Consolidation Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	529	558	587		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.07	0.09	0.15		
	Coefficient of Consolidation Cv,	m^2/year	773	391	557		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.017	0.014	0.015		
Compression Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	103	198	287		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	0.11	0.30	1.38		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	12.63	11.62	14.05		
Shear Strength Parameters	ϕ_d = 36 Degree c_d = 0 kPa		Mode of Failure				
			1	2	3	4	
Remarks : Specimens are prepared at 90% of Maximum dry density (from compaction Test) = 1.48 Mg/m^3							

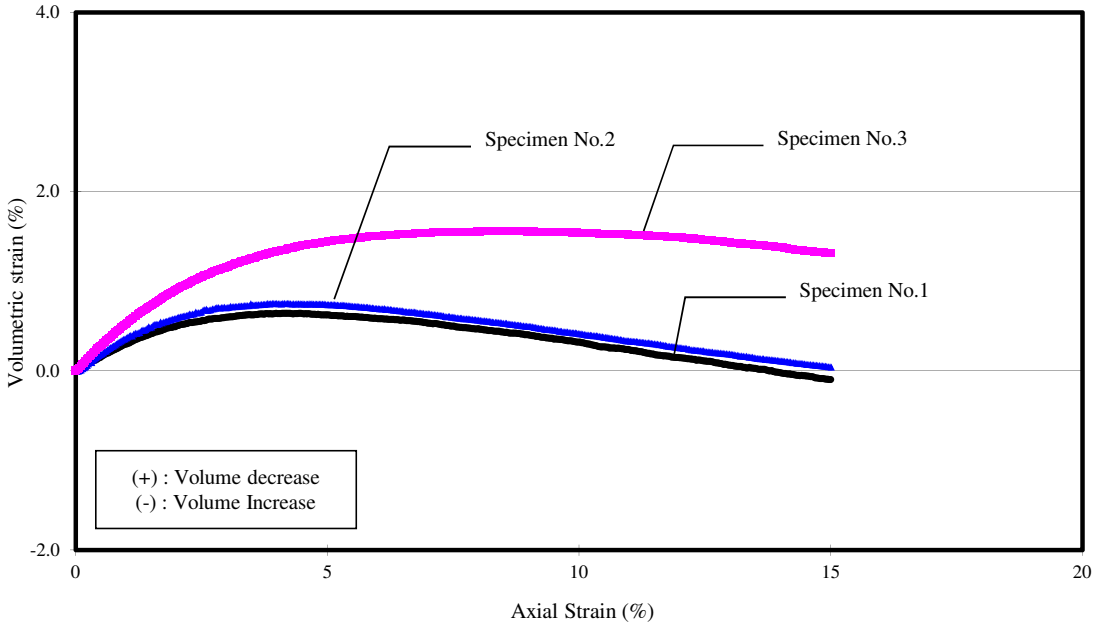
Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No.: S27-14 Sample No.: D-2 Soil Type: Clayey Sand

Borehole No.: OF-04-02 Depth : 5.00-5.80m





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

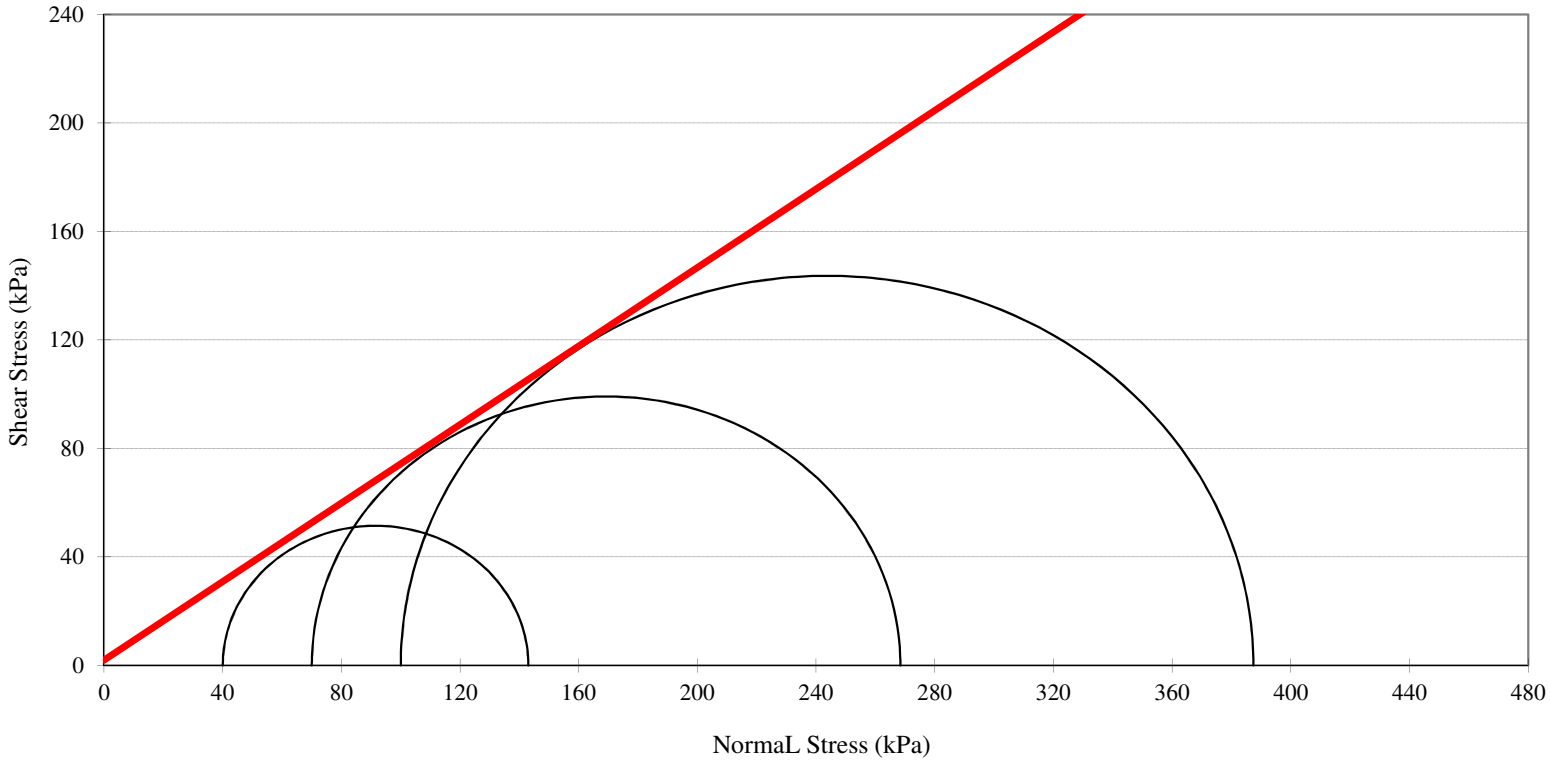
Project No. : S27-14

Borehole No. : OF-04-02 Soil Type: Clayey Sand

Sample No. : D-2 Depth : 5.00-5.80m

Angle of Internal Friction, ϕ_d 36 deg

Cohesion, c_d 0 kPa



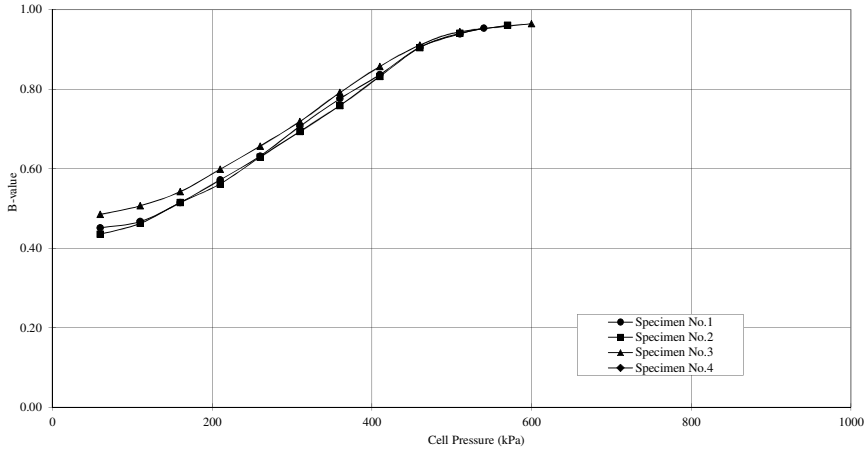
Kiso-Jiban Consultants Co., Ltd.

56

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

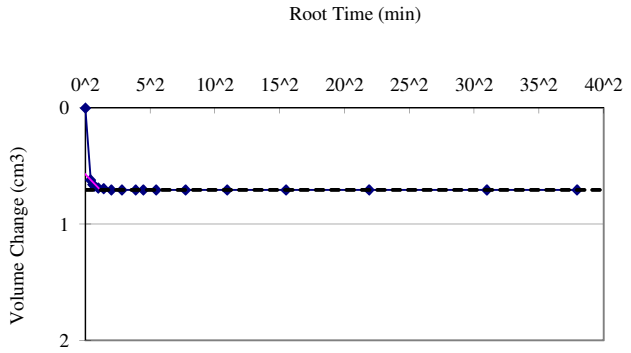
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: OF-04-02 Depth : 5.00-5.80m
Sample No.: D-2 Soil Type: Clayey Sand

		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	33.5	20	33.1	20	34.6		
	Back Pressure (kPa)	20		20		20			
	B-value	0.45		0.44		0.49			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	73.3	50	73.1	50	75.3		
	Back Pressure (kPa)	50		50		50			
	B-value	0.47		0.46		0.51			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	125.7	100	125.7	100	127.1		
	Back Pressure (kPa)	100		100		100			
	B-value	0.51		0.51		0.54			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	178.6	150	178.1	150	179.9		
	Back Pressure (kPa)	150		150		150			
	B-value	0.57		0.56		0.60			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	231.6	200	231.5	200	232.8		
	Back Pressure (kPa)	200		200		200			
	B-value	0.63		0.63		0.66			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	285.3	250	284.7	250	285.9		
	Back Pressure (kPa)	250		250		250			
	B-value	0.71		0.69		0.72			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	338.8	300	337.9	300	339.6		
	Back Pressure (kPa)	300		300		300			
	B-value	0.78		0.76		0.79			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	391.8	350	391.6	350	392.8		
	Back Pressure (kPa)	350		350		350			
	B-value	0.84		0.83		0.86			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	445.3	400	445.2	400	445.5		
	Back Pressure (kPa)	400		400		400			
	B-value	0.91		0.90		0.91			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	497.0	450	497.0	450	497.2		
	Back Pressure (kPa)	450		450		450			
	B-value	0.94		0.94		0.94			
B-check Step.11	Cell Pressure (kPa)	510	540	510	570	510	600		
	P.W.P (kPa)	500	528.6	500	557.6	500	586.8		
	Back Pressure (kPa)	500		500		500			
	B-value	0.95		0.96		0.96			



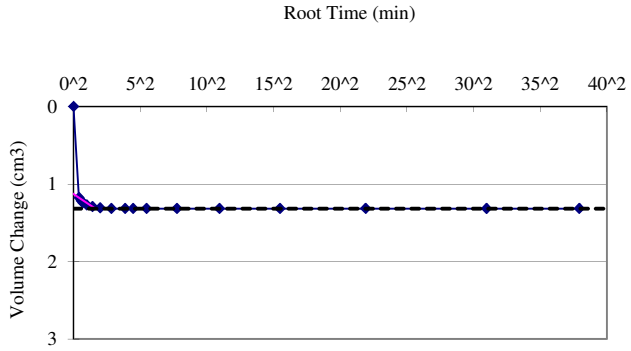
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: OF-04-02 Soil Type: Clayey Sand
Sample No.: D-2 Depth : 5.00-5.80m



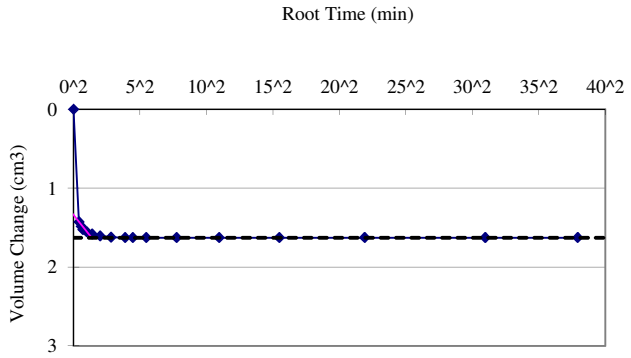
Specimen No.: 1

p' =	40	kPa
t100 =	1.3	min
Cv =	773	m^2/year
mvi=	0.017	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	2.6	min
Cv =	391	m^2/year
mvi=	0.014	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	1.8	min
Cv =	557	m^2/year
mvi=	0.015	m^2/MN

RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

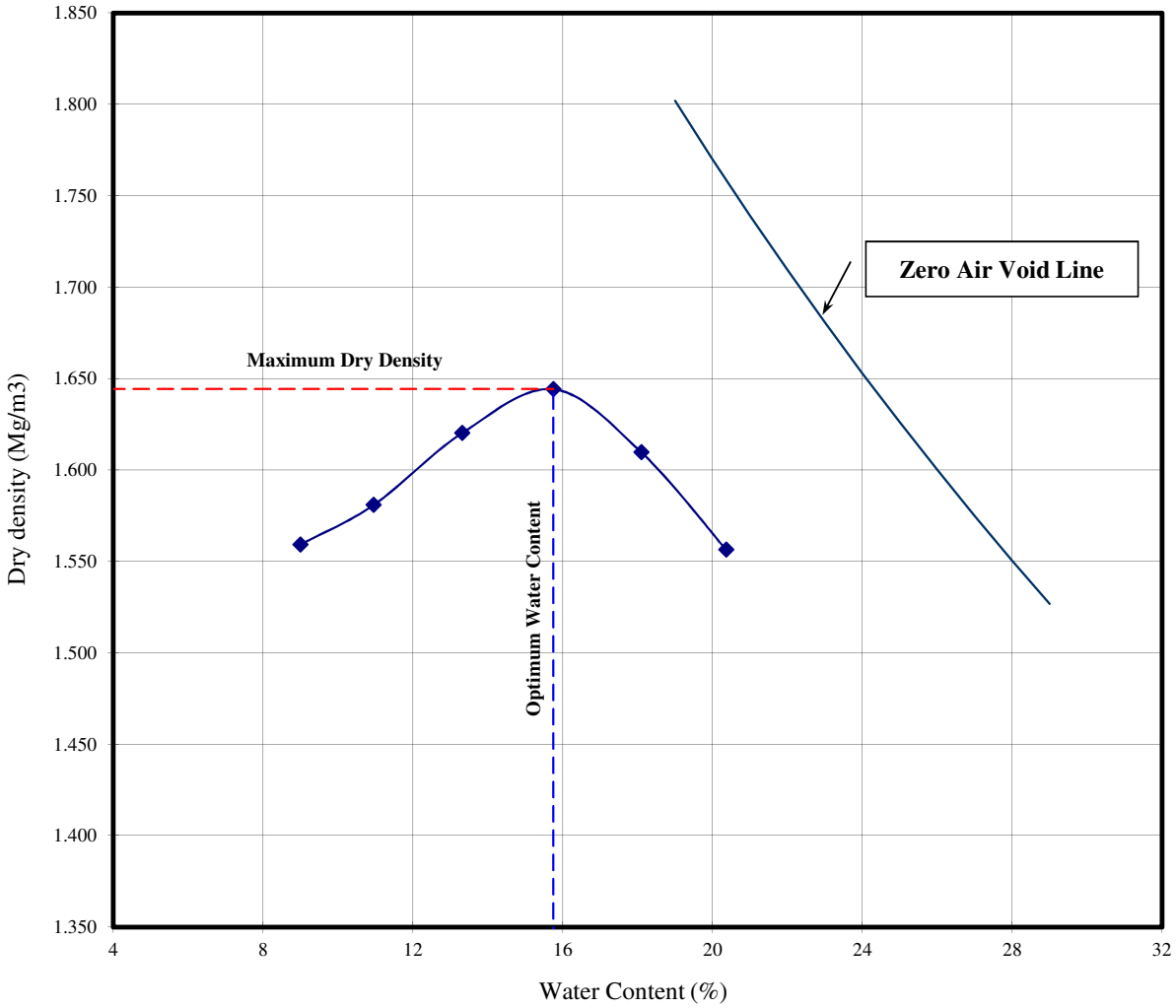
Sampling Date : - **Date of Testing :** 4-Dec-14 **Tested by :** Perera/Bala

Sample No. : OF-04-02 D-2(5.00-5.80m) **Ref. No.** -

Soil Type :	Silty Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.74	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	9.0	10.9	13.3	15.7	18.1	20.4		
Wet Density (Mg/m3)	1.700	1.754	1.836	1.903	1.901	1.873		
Dry Density (Mg/m3)	1.559	1.581	1.620	1.644	1.610	1.556		

Maximum Dry Density	**1.644 Mg/m3**
Optimum Water Content	**15.7 %**



59

8) OF-04-3

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			**OF-04-3**							
Sample No.		D-1	D-2	D-3	D-4					
Sample Depth		3.00m ~3.90m	6.00m ~6.90m	9.00m ~9.90m	12.00m ~12.90m					
Condition of Sample			Disturbed							
Natural Water Content	%	21.5	24.3	18.8	20.6					
Specific Gravity		2.70	2.69	2.69	2.70					
Wet Density	Mg/m^3	2.05	2.02	2.11	1.98					
Dry Density	Mg/m^3	1.68	1.63	1.78	1.64					
Natural Void Ratio		0.60	0.66	0.51	0.64					
Degree of Saturation	%	96	100	99	87					
Atterberg Limits	Liquid Limit, %	- *3	- *3	- *3	- *3					
	Plastic Limit, %	- *3	- *3	- *3	- *3					
	Plasticity Index, %	- *3	- *3	- *3	- *3					
Grain Size Analysis	Gravel, %	0	0	0	0					
	Sand, %	80	72	82	66					
	Silt, %	8	10	6	13					
	Clay & Colloid, %	12	18	12	21					
	Max. diameter, mm	2.00	2.00	4.75	2.00					
	Diam. at 60% mm	0.17	0.18	0.18	0.19					
	Diam. at 10% mm	-	-	-	-					
Visual soil description		Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand					
Unified soil classification		-	-	-	-					
Triaxial compression test	Angle of Internal Friction (^{0})	-	-	-	-					
	Cohesion Intercept, kPa	-	-	-	-					
	Condition of drainage	-	-	-	-					
	Angle of Internal Friction *2 (^{0})	-	-	-	-					
	Cohesion Intercept, kPa *2	-	-	-	-					
	Condition of drainage	-	-	-	-					
Consolidation Test	Preconsolidation Pressure, kPa	-	-	-	-					
	Compression Index(Average)	-	-	-	-					
	Pressure Range for Compression Index(kPa)	-	-	-	-					
	Swell index	-	-	-	-					
Chemical Test	pH value	-	-	-	-					
	Total sulphate content as SO_3, %	-	-	-	-					
	Chloride content as Cl, %	-	-	-	-					
	Organic Matter content, %	-	-	-	-					
Unconfined Compression Strength (kPa)		-	-	-	-					
Strain at failure (%)		-	-	-	-					

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

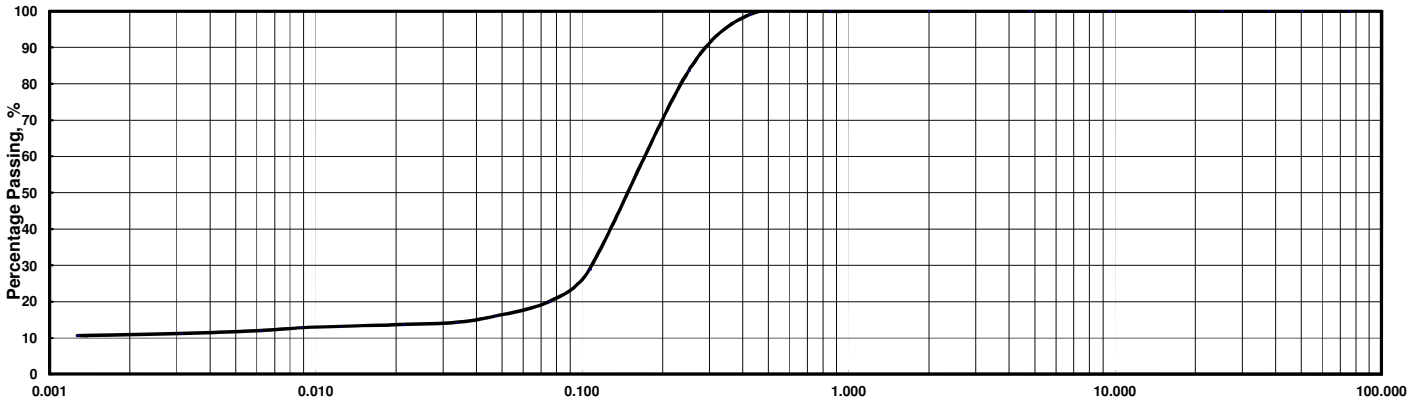
Sample No. : **OF-04-3 D-1** Depth : **3.00-3.90m** (_____) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.1	83.5	28.8	20.1
Hydro.	Dia., mm	0.047	0.034	0.021	0.012	0.0087	0.0062	0.0031	0.0013							
	% Passing	16.0	14.3	13.7	13.2	12.8	12.0	11.2	10.7							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-04-3 D-1 3.00-3.90m		Sample No. Depth	OF-04-3 D-1 3.00-3.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.17 mm	
2.00 - 0.425 mm	0.9 %		Dia. at 30%	0.11 mm	
0.425 - 0.075 mm	79.0 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	8.3 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	11.7 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.9 %				
75um Sieve Passing	20.1 %				

Kiso-Jiban Consultants Co., Ltd.

63

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

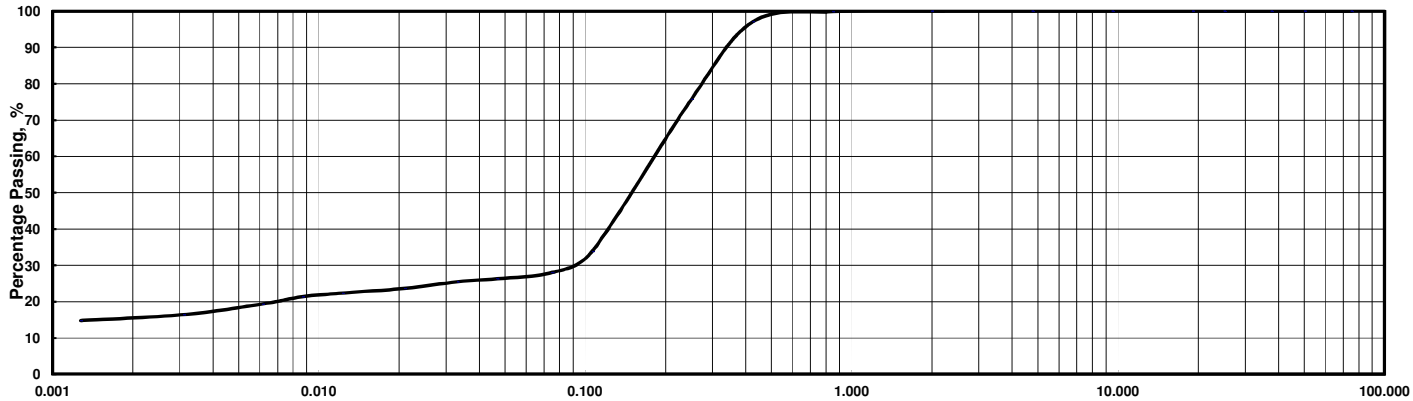
Sample No. : **OF-04-3 D-2** Depth : **6.00-6.90m** ( ) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	97.1	75.8	33.9	28.0
Hydro.	Dia., mm	0.047	0.033	0.021	0.012	0.0087	0.0062	0.0031	0.0013							
	% Passing	26.3	25.5	23.7	22.4	21.4	19.4	16.4	14.8							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-04-3 D-2 6.00-6.90m		Sample No. Depth	OF-04-3 D-2 6.00-6.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.18 mm	
2.00 - 0.425 mm	2.9 %		Dia. at 30%	0.084 mm	
0.425 - 0.075 mm	69.0 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	9.8 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	18.3 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.8 %				
75um Sieve Passing	28.0 %				

Kiso-Jiban Consultants Co., Ltd.

64

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

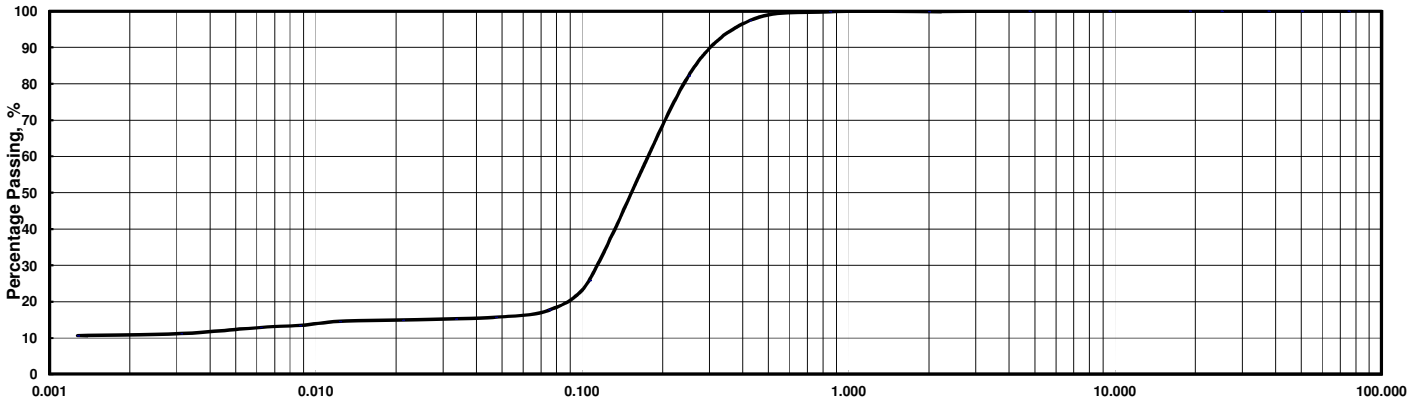
Sample No. : **OF-04-3 D-3** Depth : **9.00-9.90m** (_____) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.8	97.4	82.2	25.9	17.7
Hydro.	Dia., mm	0.047	0.033	0.021	0.012	0.0087	0.0062	0.0031	0.0013							
	% Passing	15.7	15.3	14.9	14.6	13.5	12.9	11.2	10.7							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-04-3 D-3 9.00-9.90m		Sample No. Depth	OF-04-3 D-3 9.00-9.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.2 %		Dia. at 60%	0.18 mm	
2.00 - 0.425 mm	2.4 %		Dia. at 30%	0.11 mm	
0.425 - 0.075 mm	79.7 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	5.4 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	12.3 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.8 %				
75um Sieve Passing	17.7 %				

Kiso-Jiban Consultants Co., Ltd.

65

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

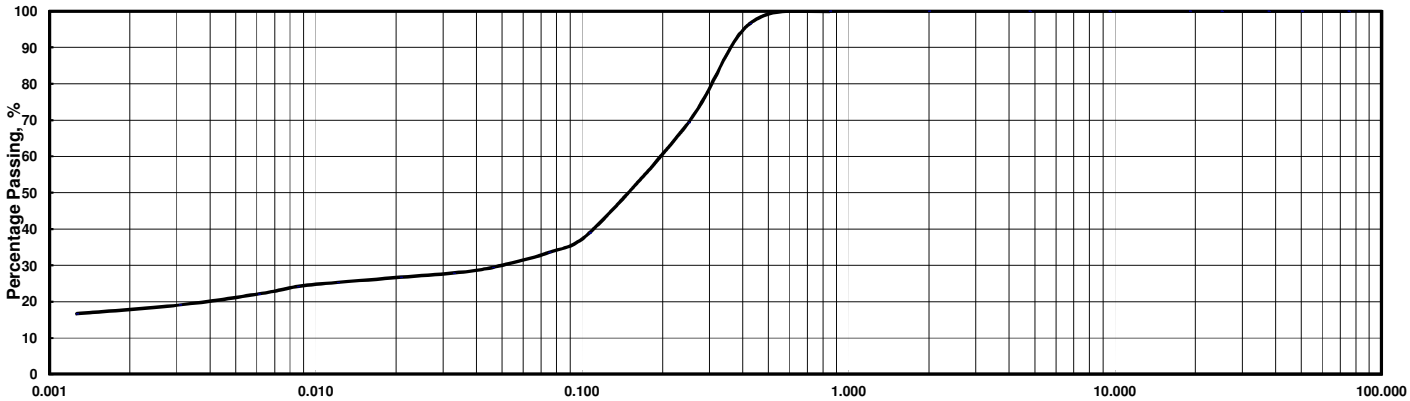
Sample No. : **OF-04-3 D-4** Depth : **12.00-12.90m** (_____) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96.6	69.3	38.9	33.6
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0085	0.0061	0.0031	0.0013							
	% Passing	29.4	27.9	26.7	25.3	24.2	22.1	19.1	16.7							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-04-3 D-4 12.00-12.90m			Sample No. Depth	OF-04-3 D-4 12.00-12.90m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.19	mm
2.00 - 0.425 mm	3.4	%		Dia. at 30%	0.049	mm
0.425 - 0.075 mm	63.0	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	12.5	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	21.0	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	33.6	%				

Kiso-Jiban Consultants Co., Ltd.

9) OF-05-1

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			OF-05-1								
Sample No.			D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	
Sample Depth			2.00m ~2.50m	2.50m ~3.30m	6.00m ~6.80m	9.00m ~9.50m	12.00m ~12.30m	12.30m ~12.90m	15.00m ~15.75m	18.00m ~18.80m	
Condition of Sample			Disturbed								
Natural Water Content		%	20.2	19.3	13.9	22.3	17.3	12.9	26.5	28.9	
Specific Gravity			2.70	2.70	2.69	2.68	2.68	2.69	2.70	2.71	
Wet Density		Mg/m^3	1.98	-	-	-	-	1.966	1.905	-	
Dry Density		Mg/m^3	1.64	-	-	-	-	1.74	1.51	-	
Natural Void Ratio			0.64	-	-	-	-	0.54	0.79	-	
Degree of Saturation		%	85	-	-	-	-	64	90	-	
Atterberg Limits	Liquid Limit,	%	- *3	- *3	- *3	- *3	- *3	- *3	23	27	
	Plastic Limit,	%	- *3	- *3	- *3	- *3	- *3	- *3	15	18	
	Plasticity Index,	%	- *3	- *3	- *3	- *3	- *3	- *3	8	9	
Grain Size Analysis	Gravel,	%	0	0	0	0	0	0	0	0	
	Sand,	%	66	77	94	83	77	94	55	50	
	Silt,	%	19	11	6	6	10	6	20	25	
	Clay & Colloid,	%	15	12		11	13		25	25	
	Max. diameter,	mm	4.75	4.75	2.00	0.850	2.00	4.75	4.75	4.75	
	Diam. at 60%	mm	0.21	0.22	0.34	0.16	0.31	0.47	0.12	0.11	
	Diam. at 10%	mm	-	0.0015	0.10	0.0024	0.0011	0.17	-	-	
Visual soil description			Silty Sand	Clayey Sand	Sand with Clay	Clayey Sand	Clayey Sand	Sand with Clay	Clayey Sand	Clayey Sand	
Unified soil classification			-	-	-	-	-	-	CL	CL	
Triaxial compression test	Angle of Internal Friction	(^{0})	-	-	-	-	-	-	-	-	
	Cohesion Intercept, kPa		-	-	-	-	-	-	-	-	
	Condition of drainage		-	-	-	-	-	-	-	-	
	Angle of Internal Friction *2	(^{0})	-	-	-	-	-	-	-	-	
	Cohesion Intercept, kPa *2		-	-	-	-	-	-	-	-	
	Condition of drainage		-	-	-	-	-	-	-	-	
Consolidation Test	Preconsolidation Pressure,	kPa	-	-	-	-	-	-	-	-	
	Compression Index(Average)		-	-	-	-	-	-	-	-	
	Pressure Range for Compression Index(kPa)		-	-	-	-	-	-	-	-	
	Swell index		-	-	-	-	-	-	-	-	
Chemical Test	pH value		-	-	-	-	-	-	-	-	
	Total sulphate content as SO_3,	%	-	-	-	-	-	-	-	-	
	Chloride content as Cl,	%	-	-	-	-	-	-	-	-	
	Organic Matter content,	%	-	-	-	-	-	-	-	-	
Unconfined Compression Strength (kPa)			-	-	-	-	-	-	-	-	
Strain at failure (%)			-	-	-	-	-	-	-	-	

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No. : S27-14

Standard : ASTM D4318-10

Date of Testing : 15.12.14

Tested By : Vasantha

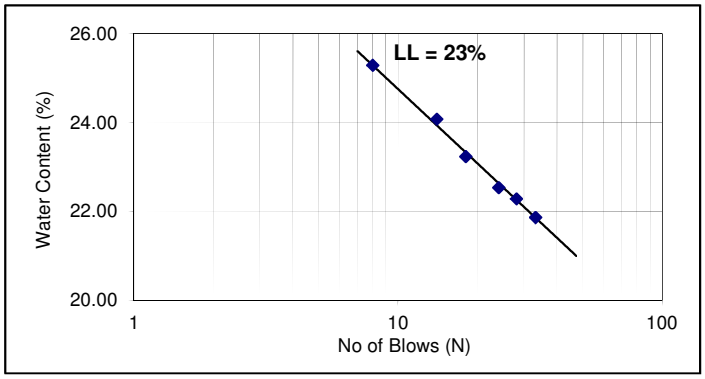
Checked By : A. B. Tan

Sample No. : OF-05-1 D-7

Depth : 15.00-15.75m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	33	21.86
2	28	22.28
3	24	22.53
4	18	23.23
5	14	24.07
6	8	25.28
Liquid Limits %		**23**
Plastic Limits %		**15**
Plasticity Index		**8**

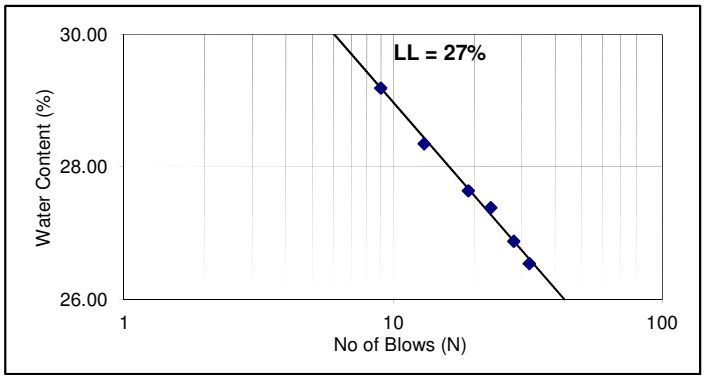


Sample No. : OF-05-1 D-8

Depth : 18.00-18.80m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	32	26.54
2	28	26.88
3	23	27.39
4	19	27.64
5	13	28.35
6	9	29.19
Liquid Limits %		**27**
Plastic Limits %		**18**
Plasticity Index		**9**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **13.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

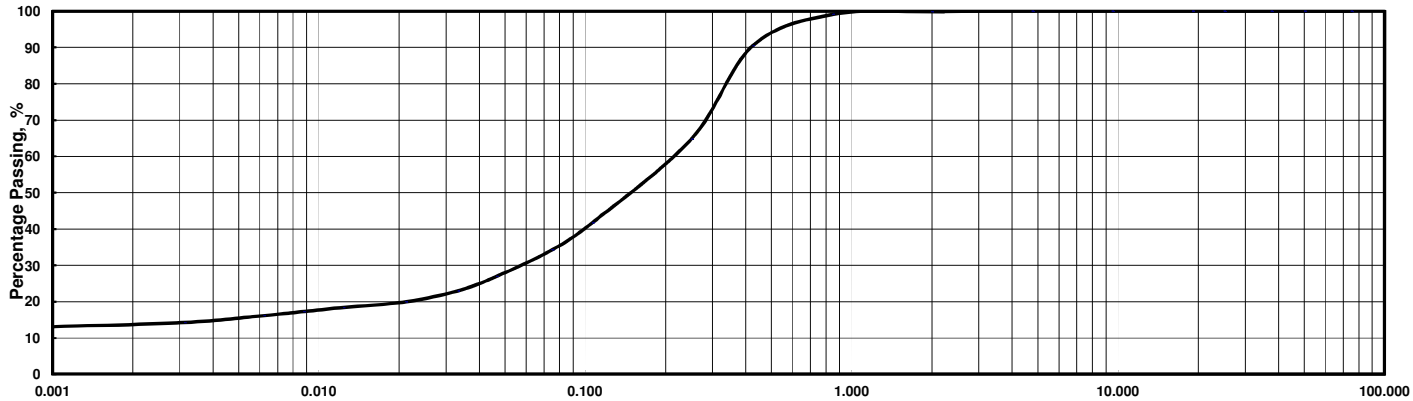
Sample No. : **OF-05-1 D-1** Depth : **2.00-2.50m** ( ) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.1	90.5	64.8	41.7	34.3
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0087	0.0062	0.0031	0.0009							
	% Passing	27.0	23.0	20.0	18.4	17.3	16.2	14.3	13.0							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1 D-1 2.00-2.50m		Sample No. Depth	OF-05-1 D-1 2.00-2.50m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.2 %		Dia. at 60%	0.21 mm	
2.00 - 0.425 mm	9.3 %		Dia. at 30%	0.057 mm	
0.425 - 0.075 mm	56.2 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	18.8 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	15.4 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.1 %				
75um Sieve Passing	34.3 %				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **13.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

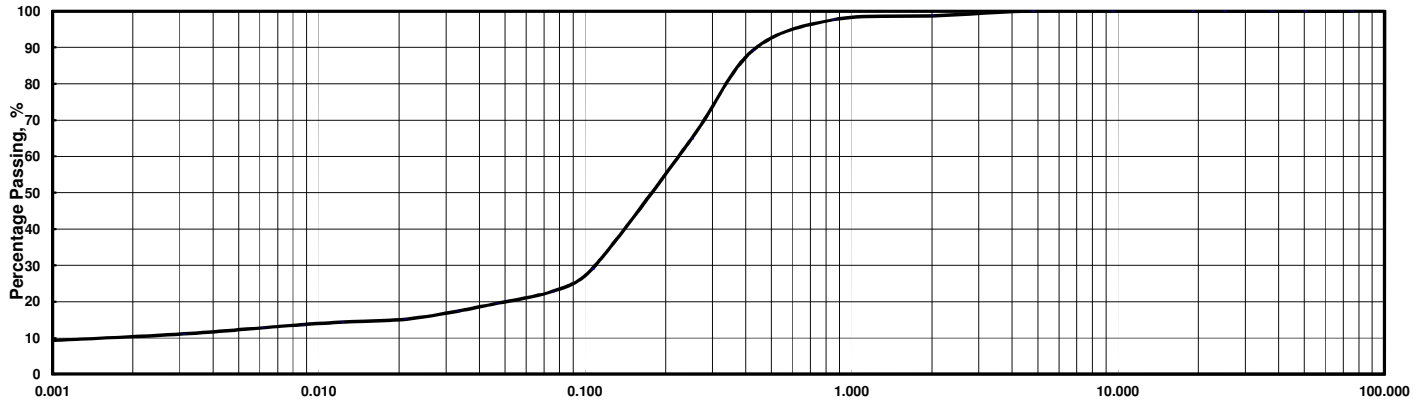
Sample No. : **OF-05-1 D-2** Depth : **2.50-3.30m** (_____) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.7	97.6	89.2	64.9	29.0	22.8
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0087	0.0061	0.0031	0.0009							
	% Passing	19.5	17.4	15.2	14.4	13.7	12.8	11.1	9.1							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1 D-2 2.50-3.30m			Sample No. Depth	OF-05-1 D-2 2.50-3.30m	
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm
4.75 - 2.00 mm	1.3	%		Dia. at 60%	0.22	mm
2.00 - 0.425 mm	9.5	%		Dia. at 30%	0.11	mm
0.425 - 0.075 mm	66.4	%		Dia. at 10%	0.0015	mm
0.075 - 0.005 mm	10.7	%		Coeff. of Uniformity	148	
Smaller than 0.005 mm	12.2	%		Coeff. of Curvature	35.3	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	97.6	%				
75um Sieve Passing	22.8	%				

Kiso-Jiban Consultants Co., Ltd.

71

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Motiur** Checked by : **A. B. Tan**

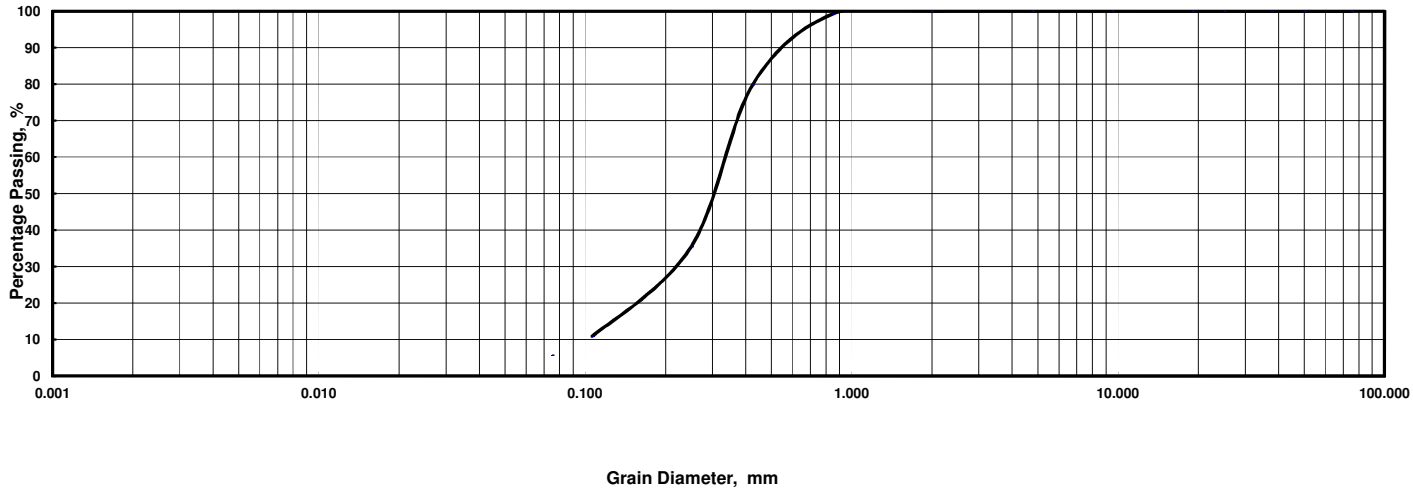
Sample No. : **OF-05-1 D-3** Depth : **6.00-6.80m** (_____) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3	79.9	35.5	11.0	5.7
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1 D-3 6.00-6.80m			Sample No. Depth	OF-05-1 D-3 6.00-6.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.34	mm
2.00 - 0.425 mm	20.1	%		Dia. at 30%	0.21	mm
0.425 - 0.075 mm	74.2	%		Dia. at 10%	0.10	mm
0.075 - 0.005 mm	5.7	%		Coeff. of Uniformity	3.37	
Smaller than 0.005 mm				Coeff. of Curvature	1.27	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.3	%				
75um Sieve Passing	5.7	%				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **13.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

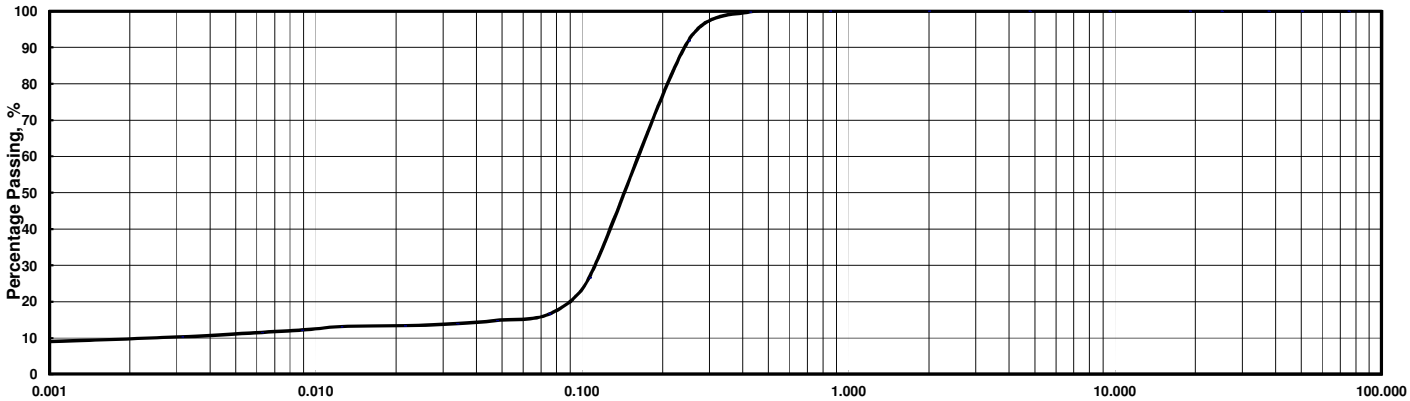
Sample No. : **OF-05-1 D-4** Depth : **9.00-9.50m** (_____) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	91.9	26.6	16.6
Hydro.	Dia., mm	0.048	0.034	0.022	0.012	0.0088	0.0063	0.0031	0.0009							
	% Passing	14.8	14.0	13.4	13.1	12.2	11.6	10.3	8.9							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1 D-4 9.00-9.50m		Sample No. Depth	OF-05-1 D-4 9.00-9.50m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.16 mm	
2.00 - 0.425 mm	0.2 %		Dia. at 30%	0.11 mm	
0.425 - 0.075 mm	83.2 %		Dia. at 10%	0.0024 mm	
0.075 - 0.005 mm	5.5 %		Coeff. of Uniformity	68.5	
Smaller than 0.005 mm	11.1 %		Coeff. of Curvature	31.2	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	16.6 %				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **13.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

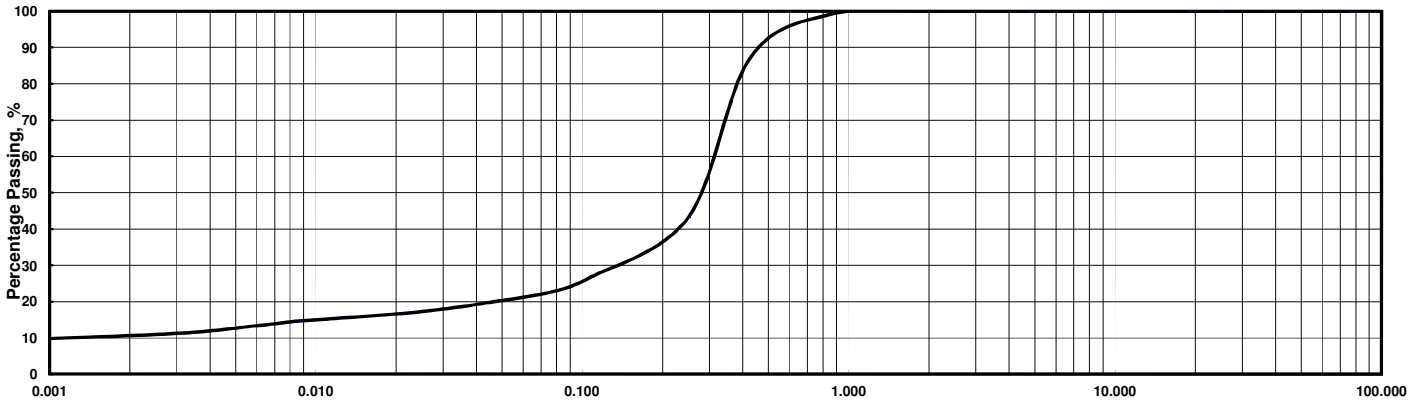
Sample No. : **OF-05-1 D-5** Depth : **12.00-12.30m** (_____) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1	87.0	43.3	26.5	22.5
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0087	0.0062	0.0031	0.0009							
	% Passing	20.0	18.4	16.7	15.4	14.7	13.5	11.3	9.7							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1 D-5 12.00-12.30m		Sample No. Depth	OF-05-1 D-5 12.00-12.30m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.31 mm	
2.00 - 0.425 mm	13.0 %		Dia. at 30%	0.13 mm	
0.425 - 0.075 mm	64.4 %		Dia. at 10%	0.0011 mm	
0.075 - 0.005 mm	9.9 %		Coeff. of Uniformity	278	
Smaller than 0.005 mm	12.7 %		Coeff. of Curvature	47.6	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.1 %				
75um Sieve Passing	22.5 %				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Motiur** Checked by : **A. B. Tan**

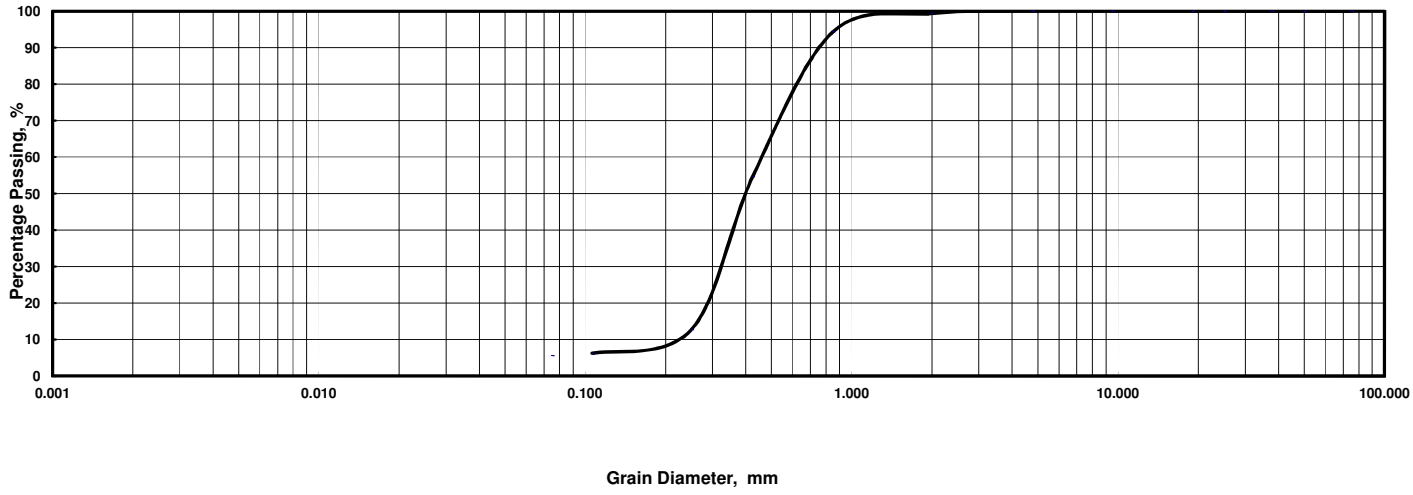
Sample No. : **OF-05-1 D-6** Depth : **12.30-12.90m** (_____) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	94.3	54.7	12.7	6.2	5.7
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1 D-6 12.30-12.90m			Sample No. Depth	OF-05-1 D-6 12.30-12.90m	
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm
4.75 - 2.00 mm	0.6	%		Dia. at 60%	0.47	mm
2.00 - 0.425 mm	44.7	%		Dia. at 30%	0.31	mm
0.425 - 0.075 mm	49.0	%		Dia. at 10%	0.17	mm
0.075 - 0.005 mm	5.7	%		Coeff. of Uniformity	2.68	
Smaller than 0.005 mm				Coeff. of Curvature	1.19	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	94.3	%				
75um Sieve Passing	5.7	%				

Kiso-Jiban Consultants Co., Ltd.

75

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **13.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

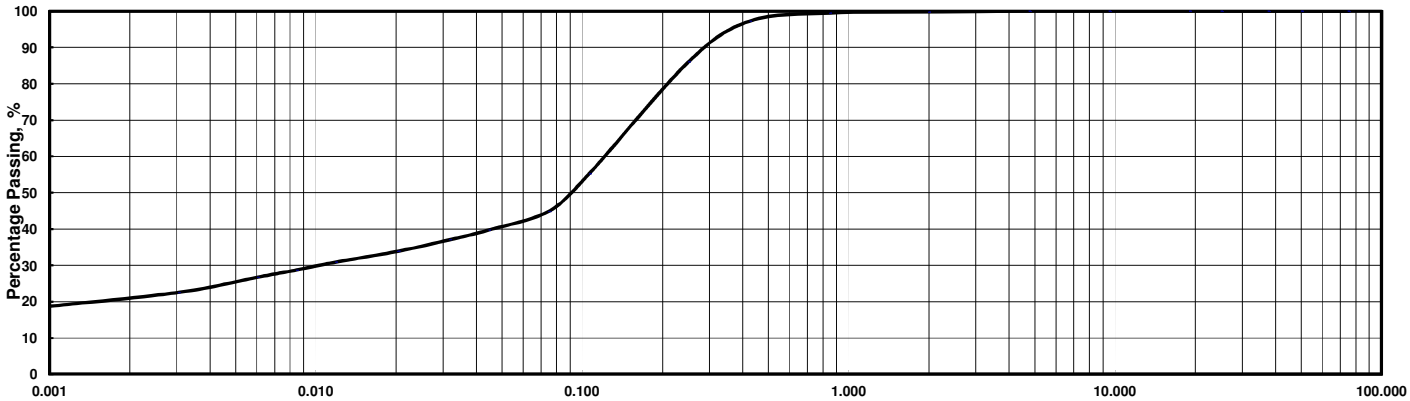
Sample No. : **OF-05-1 D-7** Depth : **15.00-15.75m** (_____) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	99.5	97.2	86.0	55.2	44.9
Hydro.	Dia., mm	0.045	0.032	0.020	0.012	0.0085	0.0060	0.0030	0.0009							
	% Passing	39.8	37.1	33.9	30.9	28.7	26.7	22.5	18.4							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1 D-7 15.00-15.75m		Sample No. Depth	OF-05-1 D-7 15.00-15.75m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.3 %		Dia. at 60%	0.12 mm	
2.00 - 0.425 mm	2.5 %		Dia. at 30%	0.010 mm	
0.425 - 0.075 mm	52.3 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	19.6 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	25.3 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.5 %				
75um Sieve Passing	44.9 %				

Kiso-Jiban Consultants Co., Ltd.

76

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **13.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

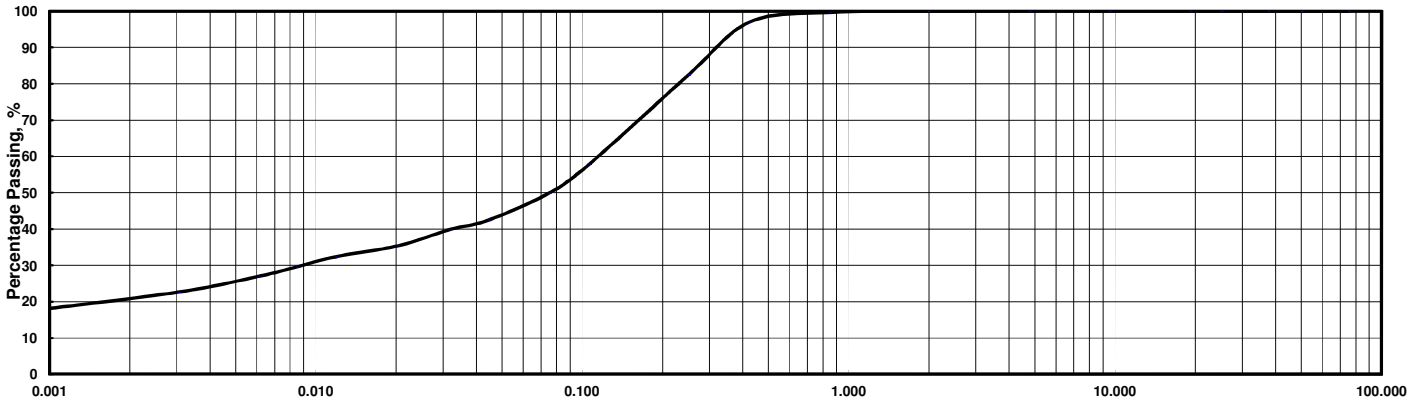
Sample No. : **OF-05-1 D-8** Depth : **18.00-18.80m** (_____) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.6	97.0	82.4	57.8	49.9
Hydro.	Dia., mm	0.044	0.032	0.020	0.012	0.0084	0.0060	0.0030	0.0009							
	% Passing	42.5	39.8	35.4	32.4	29.5	26.9	22.6	17.7							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1 D-8 18.00-18.80m		Sample No. Depth	OF-05-1 D-8 18.00-18.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.1 %		Dia. at 60%	0.11 mm	
2.00 - 0.425 mm	2.9 %		Dia. at 30%	0.0089 mm	
0.425 - 0.075 mm	47.1 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	24.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	25.4 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.6 %				
75um Sieve Passing	49.9 %				

Kiso-Jiban Consultants Co., Ltd.

77

10) OF-05-1a

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			OF-05-1a								
Sample No.			D-1	D-2	D-3	D-4	D-5	D-6			
Sample Depth			4.00m ~4.90m	4.90m ~5.70m	8.00m ~8.75m	11.00m ~11.90m	15.00m ~15.90m	18.00m ~18.90m			
Condition of Sample			Disturbed								
Natural Water Content		%	27.5	28.0	22.7	24.3	28.2	20.9			
Specific Gravity			2.70	2.69	2.68	2.68	2.72	2.70			
Wet Density		Mg/m^3	1.96	1.97	2.07	2.01	1.98	2.01			
Dry Density		Mg/m^3	1.53	1.54	1.68	1.62	1.55	1.66			
Natural Void Ratio			0.76	0.75	0.59	0.65	0.76	0.63			
Degree of Saturation		%	98	100	100	100	100	90			
Atterberg Limits	Liquid Limit,	%	- *3	- *3	- *3	- *3	26	- *3			
	Plastic Limit,	%	- *3	- *3	- *3	- *3	18	- *3			
	Plasticity Index,	%	- *3	- *3	- *3	- *3	8	- *3			
Grain Size Analysis	Gravel,	%	0	0	0	0	0	0			
	Sand,	%	75	76	93	93	33	52			
	Silt,	%	10	11	7	7	40	27			
	Clay & Colloid,	%	15	13			27	21			
	Max. diameter,	mm	0.425	2.00	2.00	2.00	2.00	2.00			
	Diam. at 60%	mm	0.13	0.15	0.24	0.19	0.042	0.12			
	Diam. at 10%	mm	-	-	0.095	0.094	-	-			
Visual soil description			Clayey Sand	Clayey Sand	Sand with Clay	Sand with Clay	Sandy Clay	Silty Sand			
Unified soil classification			-	-	-	-	CL	-			
Triaxial compression test	Angle of Internal Friction	(^{0})	-	-	-	-	-	-			
	Cohesion Intercept, kPa		-	-	-	-	-	-			
	Condition of drainage		-	-	-	-	-	-			
	Angle of Internal Friction *2	(^{0})	-	-	-	-	-	-			
	Cohesion Intercept, kPa *2		-	-	-	-	-	-			
	Condition of drainage		-	-	-	-	-	-			
Consolidation Test	Preconsolidation Pressure,	kPa	-	-	-	-	-	-			
	Compression Index(Average)		-	-	-	-	-	-			
	Pressure Range for Compression Index(kPa)		-	-	-	-	-	-			
	Swell index		-	-	-	-	-	-			
Chemical Test	pH value		-	-	-	-	-	-			
	Total sulphate content as SO_3,	%	-	-	-	-	-	-			
	Chloride content as Cl,	%	-	-	-	-	-	-			
	Organic Matter content,	%	-	-	-	-	-	-			
Unconfined Compression Strength (kPa)			-	-	-	-	-	-			
Strain at failure (%)			-	-	-	-	-	-			

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No. : S27-14

Standard : ASTM D4318-10

Date of Testing : 15.12.14

Tested By : Vasantha

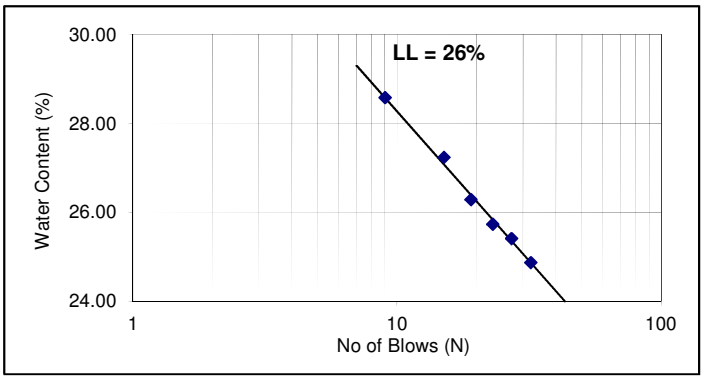
Checked By : A. B. Tan

Sample No. : OF-05-1A D-5

Depth : 15.00-15.90m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	32	24.87
2	27	25.40
3	23	25.73
4	19	26.28
5	15	27.23
6	9	28.57
Liquid Limits %		**26**
Plastic Limits %		**18**
Plasticity Index		**8**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

81

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

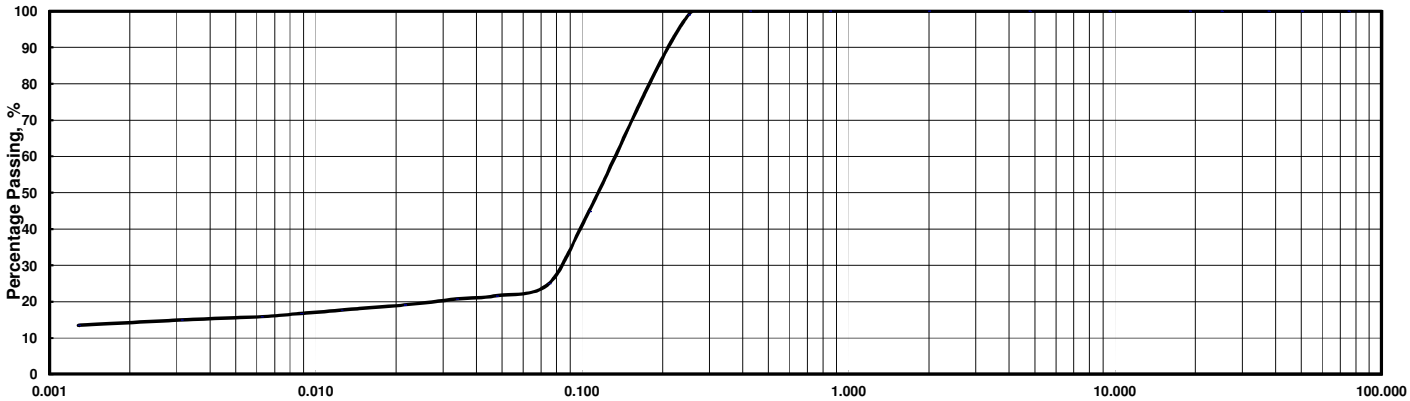
Sample No. : **OF-05-1a D-1** Depth : **4.00-4.90m** (_____) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.9	44.9	25.0
Hydro.	Dia., mm	0.048	0.034	0.021	0.012	0.0088	0.0062	0.0031	0.0013							
	% Passing	21.6	20.7	19.1	17.7	16.8	15.9	15.0	13.5							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-05-1a D-1 4.00-4.90m		Sample No. Depth	OF-05-1a D-1 4.00-4.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.13 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.082 mm	
0.425 - 0.075 mm	75.0 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	9.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	15.5 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	25.0 %				

Kiso-Jiban Consultants Co., Ltd.

82

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

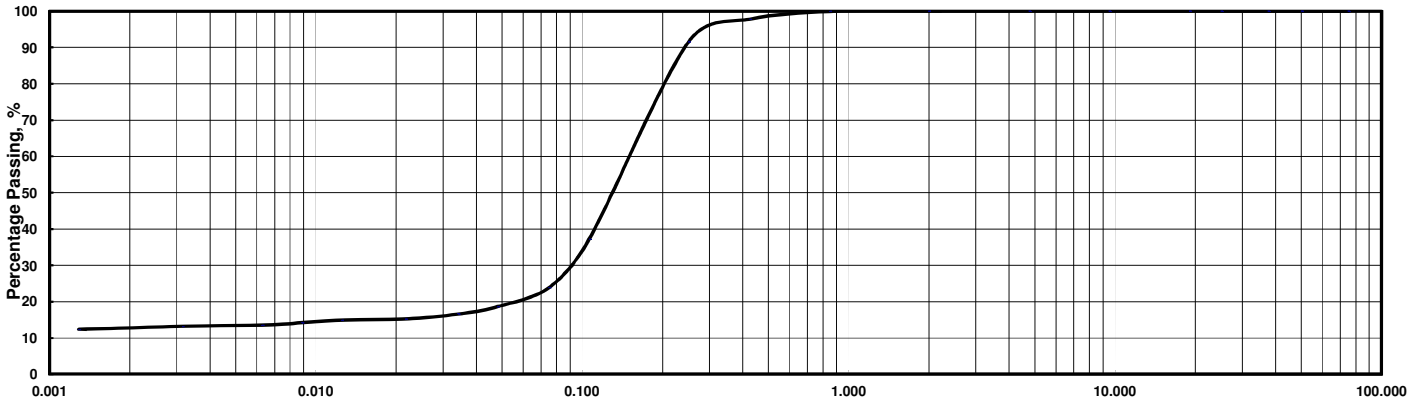
Sample No. : **OF-05-1a D-2** Depth : **4.90-5.70m** (_____) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	97.8	91.5	37.2	23.9
Hydro.	Dia., mm	0.048	0.034	0.022	0.013	0.0089	0.0063	0.0031	0.0013							
	% Passing	18.6	16.6	15.2	14.9	14.2	13.5	13.2	12.4							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-05-1a D-2 4.90-5.70m			Sample No. Depth	OF-05-1a D-2 4.90-5.70m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.15	mm
2.00 - 0.425 mm	2.2	%		Dia. at 30%	0.088	mm
0.425 - 0.075 mm	73.9	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	10.5	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	13.4	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.9	%				
75um Sieve Passing	23.9	%				

Kiso-Jiban Consultants Co., Ltd.

83

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Motiur** Checked by : **A. B. Tan**

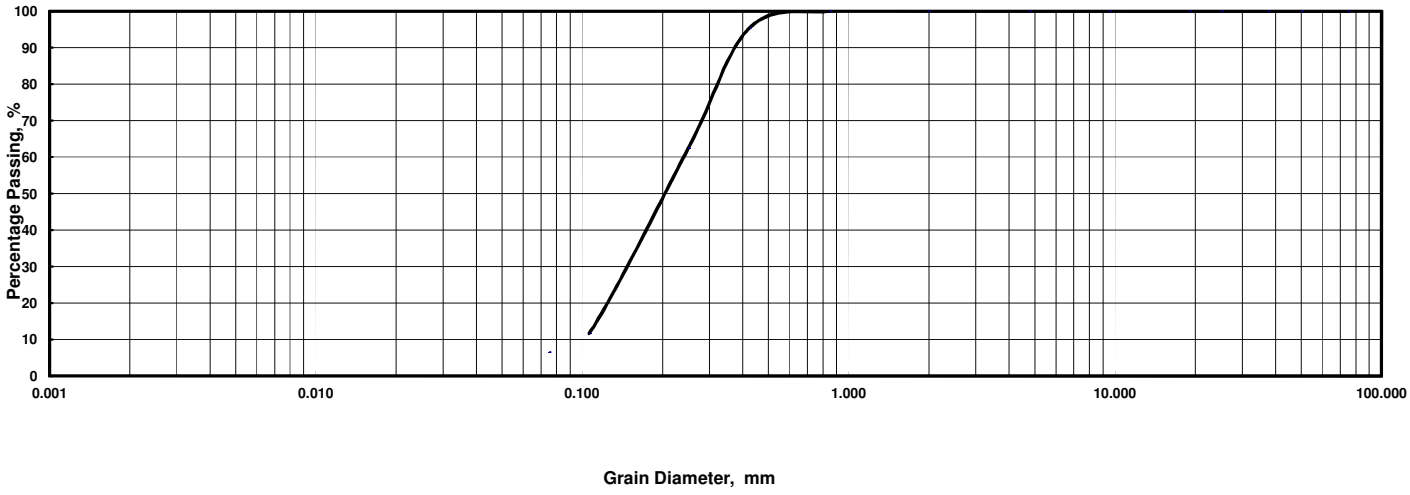
Sample No. : **OF-05-1a D-3** Depth : **8.00-8.75m** (_____) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.5	62.5	11.7	6.6
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Sample No. Depth	OF-05-1a D-3 8.00-8.75m			Sample No. Depth	OF-05-1a D-3 8.00-8.75m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.24	mm
2.00 - 0.425 mm	4.5	%		Dia. at 30%	0.14	mm
0.425 - 0.075 mm	88.8	%		Dia. at 10%	0.095	mm
0.075 - 0.005 mm	6.6	%		Coeff. of Uniformity	2.54	
Smaller than 0.005 mm				Coeff. of Curvature	0.92	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	6.6	%				

Kiso-Jiban Consultants Co., Ltd.

84

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Motiur** Checked by : **A. B. Tan**

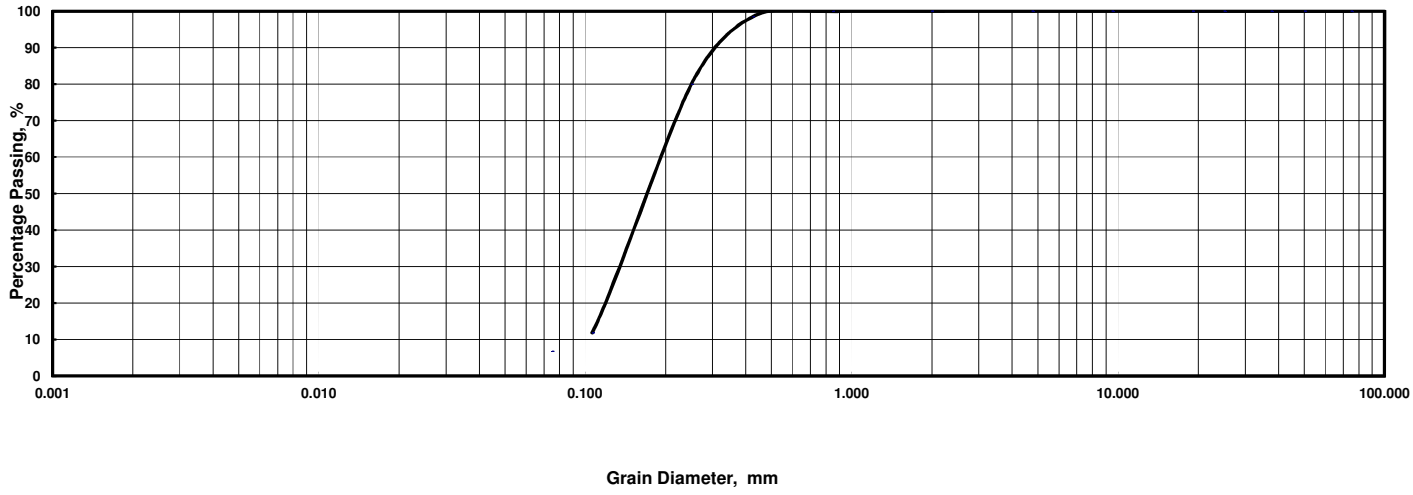
Sample No. : **OF-05-1a D-4** Depth : **11.00-11.90m** (_____) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	98.5	80.0	11.8	6.8
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1a D-4 11.00-11.90m			Sample No. Depth	OF-05-1a D-4 11.00-11.90m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.19	mm
2.00 - 0.425 mm	1.5	%		Dia. at 30%	0.13	mm
0.425 - 0.075 mm	91.7	%		Dia. at 10%	0.094	mm
0.075 - 0.005 mm	6.8	%		Coeff. of Uniformity	2.08	
Smaller than 0.005 mm				Coeff. of Curvature	0.98	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.9	%				
75um Sieve Passing	6.8	%				

Kiso-Jiban Consultants Co., Ltd.

85

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **13.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

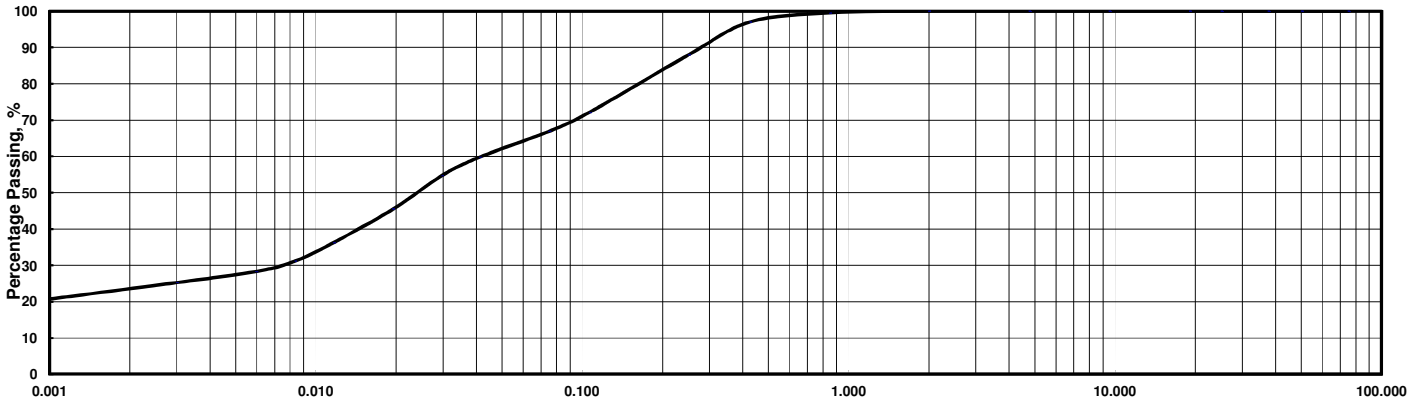
Sample No. : **OF-05-1a D-5** Depth : **15.00-15.90m** (_____) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.5	97.0	88.0	72.1	66.9
Hydro.	Dia., mm	0.041	0.030	0.019	0.012	0.0083	0.0060	0.0030	0.0009							
	% Passing	59.8	54.8	45.5	36.2	31.2	28.3	25.3	20.2							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1a D-5 15.00-15.90m		Sample No. Depth	OF-05-1a D-5 15.00-15.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.042 mm	
2.00 - 0.425 mm	3.0 %		Dia. at 30%	0.0073 mm	
0.425 - 0.075 mm	30.1 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	39.6 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	27.3 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.5 %				
75um Sieve Passing	66.9 %				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **13.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

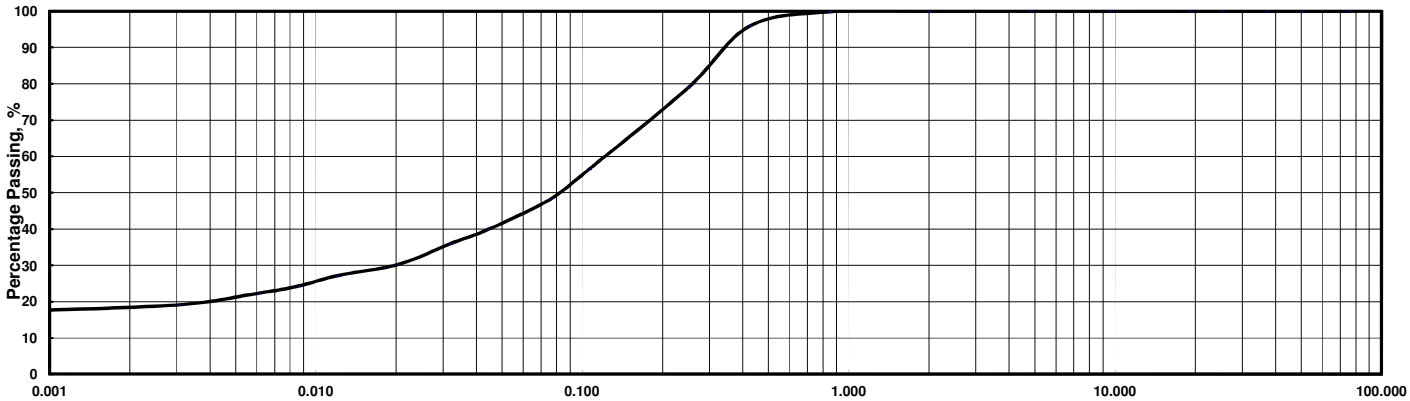
Sample No. : **OF-05-1a D-6** Depth : **18.00-18.90m** (_____) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	95.9	79.0	56.5	48.0
Hydro.	Dia., mm	0.044	0.032	0.021	0.012	0.0085	0.0061	0.0031	0.0009							
	% Passing	39.9	35.9	30.3	27.1	24.3	22.3	19.2	17.6							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1a D-6 18.00-18.90m		Sample No. Depth	OF-05-1a D-6 18.00-18.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.12 mm	
2.00 - 0.425 mm	4.1 %		Dia. at 30%	0.019 mm	
0.425 - 0.075 mm	47.8 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	26.9 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	21.2 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.8 %				
75um Sieve Passing	48.0 %				

Kiso-Jiban Consultants Co., Ltd.

87

11) OF-05-1b

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			OF-05-1b								
Sample No.			D-1	D-2	D-3	D-4					
Sample Depth			7.00m ~7.85m	10.00m ~10.90m	13.00m ~13.70m	16.00m ~16.80m					
Condition of Sample			Disturbed								
Natural Water Content		%	25.6	25.0	19.8	20.0					
Specific Gravity			2.69	2.70	2.67	2.67					
Wet Density		Mg/m^3	1.95	1.95	1.98	2.00					
Dry Density		Mg/m^3	1.55	1.56	1.65	1.67					
Natural Void Ratio			0.73	0.73	0.61	0.60					
Degree of Saturation		%	94	92	86	88					
Atterberg Limits	Liquid Limit,	%	- *3	- *3	- *3	- *3					
	Plastic Limit,	%	- *3	- *3	- *3	- *3					
	Plasticity Index,	%	- *3	- *3	- *3	- *3					
Grain Size Analysis	Gravel,	%	0	0	0	0					
	Sand,	%	78	62	96	92					
	Silt,	%	9	19	4	8					
	Clay & Colloid,	%	13	19							
	Max. diameter,	mm	2.00	0.425	2.00	0.85					
	Diam. at 60%	mm	0.16	0.13	0.33	0.33					
	Diam. at 10%	mm	-	-	0.12	0.090					
Visual soil description			Clayey Sand	Clayey Sand	Sand	Sand with Clay					
Unified soil classification			-	-	-	-					
Triaxial compression test	Angle of Internal Friction	(^{0})	-	-	-	-					
	Cohesion Intercept, kPa		-	-	-	-					
	Condition of drainage		-	-	-	-					
	Angle of Internal Friction *2	(^{0})	-	-	-	-					
	Cohesion Intercept, kPa *2		-	-	-	-					
	Condition of drainage		-	-	-	-					
Consolidation Test	Preconsolidation Pressure,	kPa	-	-	-	-					
	Compression Index(Average)		-	-	-	-					
	Pressure Range for Compression Index(kPa)		-	-	-	-					
	Swell index		-	-	-	-					
Chemical Test	pH value		-	-	-	-					
	Total sulphate content as SO_3,	%	-	-	-	-					
	Chloride content as Cl,	%	-	-	-	-					
	Organic Matter content,	%	-	-	-	-					
Unconfined Compression Strength (kPa)			-	-	-	-					
Strain at failure (%)			-	-	-	-					

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **13.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

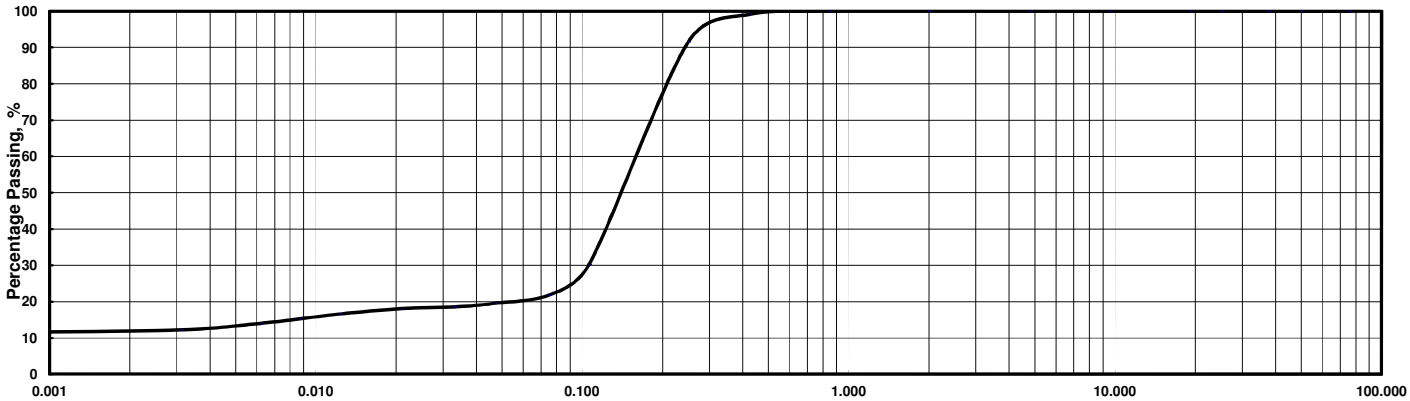
Sample No. : **OF-05-1b D-1** Depth : **7.00-7.85m** (_____) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1	91.6	30.2	21.8
Hydro.	Dia., mm	0.047	0.033	0.021	0.012	0.0087	0.0062	0.0031	0.0009							
	% Passing	19.5	18.6	18.1	16.6	15.3	14.0	12.2	11.6							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1b D-1 7.00-7.80m			Sample No. Depth	OF-05-1b D-1 7.00-7.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.16	mm
2.00 - 0.425 mm	0.9	%		Dia. at 30%	0.11	mm
0.425 - 0.075 mm	77.3	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	8.5	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	13.3	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	21.8	%				

Kiso-Jiban Consultants Co., Ltd.

91

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **13.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

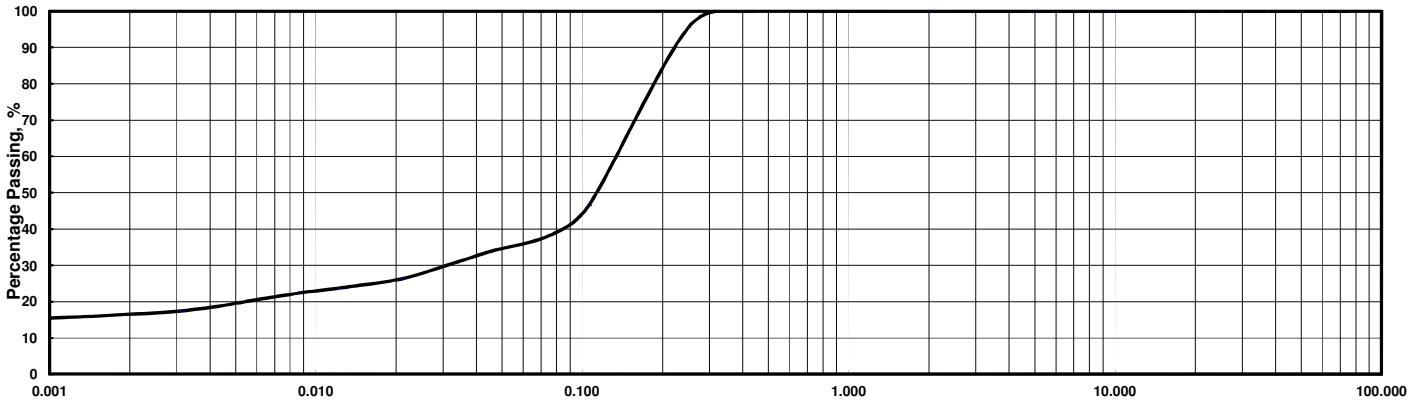
Sample No. : **OF-05-1b D-2** Depth : **10.00-10.90m** (_____) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.5	46.7	38.2
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0009							
	% Passing	33.9	30.5	26.3	23.7	22.4	20.7	17.5	15.3							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1b D-2 10.00-10.90m			Sample No. Depth	OF-05-1b D-2 10.00-10.90m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.425	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.13	mm
2.00 - 0.425 mm	0.0	%		Dia. at 30%	0.031	mm
0.425 - 0.075 mm	61.8	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	18.7	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	19.5	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	38.2	%				

Kiso-Jiban Consultants Co., Ltd.

92

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Motiur** Checked by : **A. B. Tan**

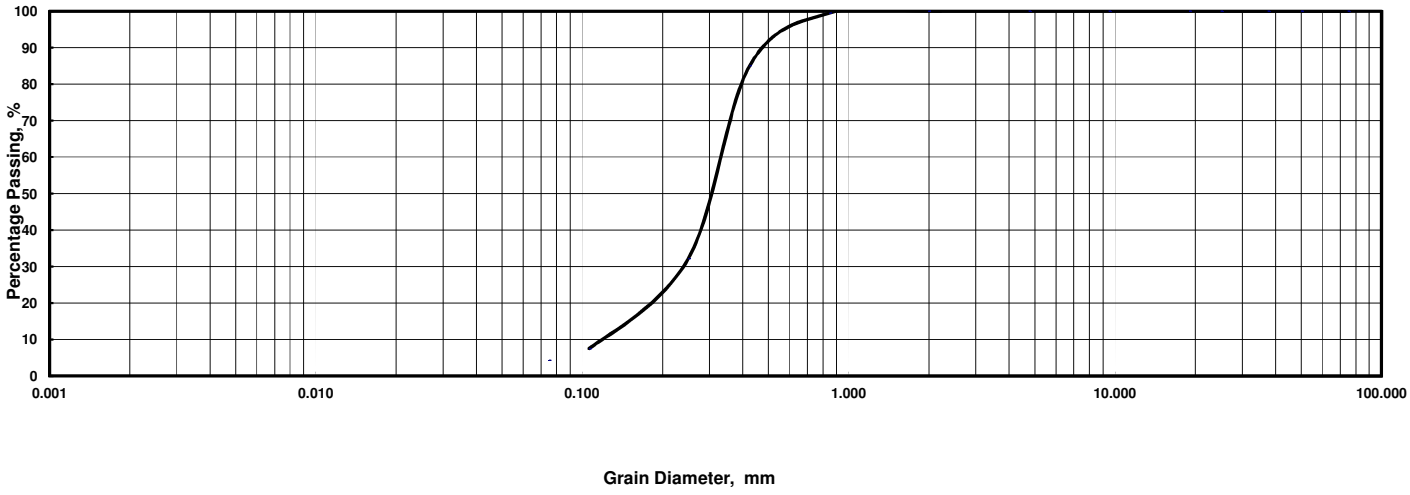
Sample No. : **OF-05-1b D-3** Depth : **13.00-13.70m** (_____) Specific Gravity : 2.67

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.5	85.1	32.2	7.6	4.4
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-05-1b D-3 13.00-13.70m		Sample No. Depth	OF-05-1b D-3 13.00-13.70m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.33 mm	
2.00 - 0.425 mm	14.9 %		Dia. at 30%	0.23 mm	
0.425 - 0.075 mm	80.7 %		Dia. at 10%	0.12 mm	
0.075 - 0.005 mm	4.4 %		Coeff. of Uniformity	2.86	
Smaller than 0.005 mm			Coeff. of Curvature	1.40	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.5 %				
75um Sieve Passing	4.4 %				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **12.12.14** Tested By : **Motiur** Checked by : **A. B. Tan**

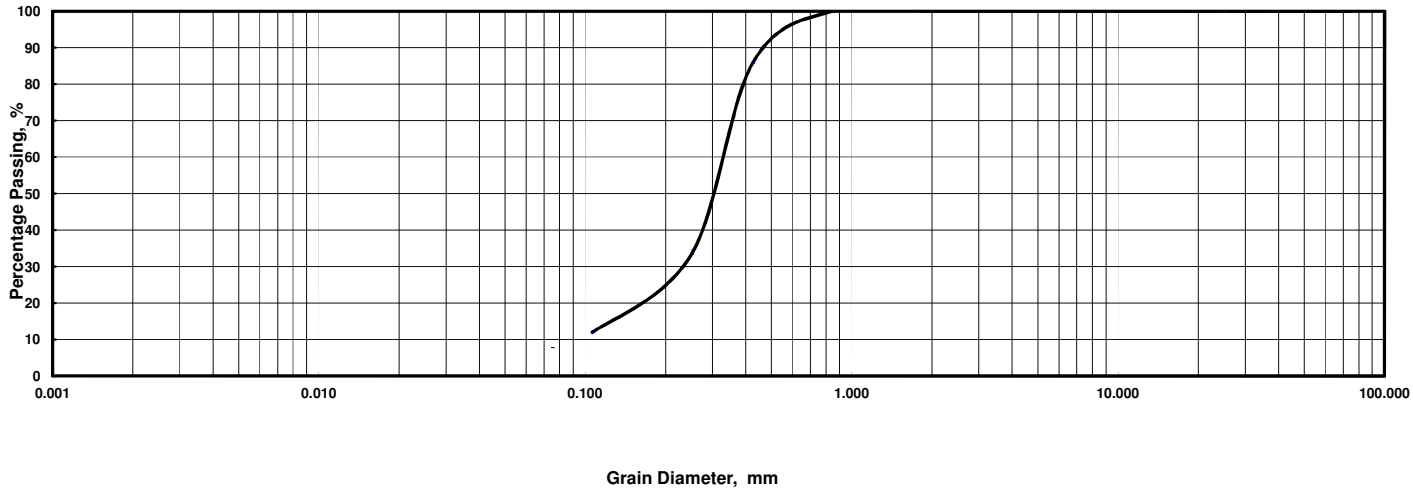
Sample No. : **OF-05-1b D-4** Depth : **16.00-16.80m** (_____) Specific Gravity : 2.67

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	85.9	33.4	12.0	7.9
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-1b D-4 16.00-16.80m		Sample No. Depth	OF-05-1b D-4 16.00-16.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.85 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.33 mm	
2.00 - 0.425 mm	14.1 %		Dia. at 30%	0.22 mm	
0.425 - 0.075 mm	78.0 %		Dia. at 10%	0.090 mm	
0.075 - 0.005 mm	7.9 %		Coeff. of Uniformity	3.64	
Smaller than 0.005 mm			Coeff. of Curvature	1.62	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	7.9 %				

Kiso-Jiban Consultants Co., Ltd.

94

12) OF-05-2

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.		OF-05-2								
Sample No.		D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	D-9
Sample Depth		1.00m ~1.80m	3.00m ~3.80m	5.00m ~5.80m	7.00m ~7.80m	10.00m ~10.50m	10.50m ~11.30m	14.00m ~14.80m	17.00m ~17.80m	20.00m ~20.80m
Condition of Sample		Disturbed								
Natural Water Content	%	19.5	34.5	23.5	25.8	20.8	21.6	15.6	25.2	23.2
Specific Gravity		2.77	2.72	2.69	2.70	2.69	2.68	2.67	2.70	2.70
Wet Density	Mg/m^3	1.90	1.90	1.96	1.83	-	1.81	-	-	-
Dry Density	Mg/m^3	1.59	1.41	1.58	1.45	-	1.49	-	-	-
Natural Void Ratio		0.74	0.92	0.70	0.86	-	0.80	-	-	-
Degree of Saturation	%	73	100	91	81	-	72	-	-	-
Atterberg Limits	Liquid Limit, %	- *3	- *3	- *3	- *3	- *3	- *3	- *3	- *3	- *3
	Plastic Limit, %	- *3	- *3	- *3	- *3	- *3	- *3	- *3	- *3	- *3
	Plasticity Index, %	- *3	- *3	- *3	- *3	- *3	- *3	- *3	- *3	- *3
Grain Size Analysis	Gravel, %	0	0	0	0	0	0	1	0	0
	Sand, %	97	32	59	75	77	89	87	62	47
	Silt, %	3	38	18	12	10	11	12	13	26
	Clay & Colloid, %		30	23	13	13			25	27
	Max. diameter, mm	4.75	2.00	2.00	2.00	0.850	2.00	9.50	2.00	2.00
	Diam. at 60% mm	0.23	0.050	0.15	0.14	0.17	0.18	0.34	0.14	0.10
	Diam. at 10% mm	0.11	-	-	-	-	-	-	-	-
Visual soil description		Sand	Sandy Clay	Clayey Sand	Clayey Sand	Clayey Sand	Sand with Clay	Clayey Sand	Clayey Sand	Sandy Clay
Unified soil classification		-	-	-	-	-	-	-		
Triaxial compression test	Angle of Internal Friction (^{0})	-	-	-	-	-	-	-	-	-
	Cohesion Intercept, kPa	-	-	-	-	-	-	-	-	-
	Condition of drainage	-	-	-	-	-	-	-	-	-
	Angle of Internal Friction *2 (^{0})	38	-	35	-	-	-	39	-	-
	Cohesion Intercept, kPa *2	0	-	0	-	-	-	0	-	-
	Condition of drainage	CD*5	-	CD*5	-	-	-	CD*5	-	-
Consolidation Test	Preconsolidation Pressure, kPa	-	-	-	-	-	-	-	-	-
	Compression Index(Average)	-	-	-	-	-	-	-	-	-
	Pressure Range for Compression Index(kPa)	-	-	-	-	-	-	-	-	-
	Swell index	-	-	-	-	-	-	-	-	-
Compaction Test *4	Maximum Dry Density, Mg/m^3	1.67	-	1.91	-	-	-	1.79	-	-
	Optimum Moisture Content , %	15.7	-	12.9	-	-	-	13.0	-	-
Unconfined Compression Strength (kPa)		-	-	-	-	-	-	-	-	-
Strain at failure (%)		-	-	-	-	-	-	-	-	-

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

*4 : By using 2.5 kg Rammer *5 : Specimens are prepared at 90% of Maximum dry density

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

96

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			OF-05-2							
Sample No.			D-10	D-11						
Sample Depth			23.00m ~23.75m	25.00m ~25.50m						
Condition of Sample			Disturbed							
Natural Water Content		%	21.7	18.1						
Specific Gravity			2.69	2.67						
Wet Density		Mg/m^3	1.92	-						
Dry Density		Mg/m^3	1.58	-						
Natural Void Ratio			0.70	-						
Degree of Saturation		%	83	-						
Atterberg Limits	Liquid Limit,	%	- *3	- *3						
	Plastic Limit,	%	- *3	- *3						
	Plasticity Index,	%	- *3	- *3						
Grain Size Analysis	Gravel,	%	0	0						
	Sand,	%	51	74						
	Silt,	%	20	8						
	Clay & Colloid,	%	29	18						
	Max. diameter,	mm	2.00	4.75						
	Diam. at 60%	mm	0.12	0.34						
	Diam. at 10%	mm	-	-						
Visual soil description			Clayey Sand	Clayey Sand						
Unified soil classification			-	-						
Triaxial compression test	Angle of Internal Friction	(^{0})	-	-						
	Cohesion Intercept, kPa		-	-						
	Condition of drainage		-	-						
	Angle of Internal Friction *2	(^{0})	-	-						
	Cohesion Intercept, kPa *2		-	-						
	Condition of drainage		-	-						
Consolidation Test	Preconsolidation Pressure,	kPa	-	-						
	Compression Index(Average)		-	-						
	Pressure Range for Compression Index(kPa)		-	-						
	Swell index		-	-						
Chemical Test	pH value		-	-						
	Total sulphate content as $S0_3$,	%	-	-						
	Chloride content as Cl,	%	-	-						
	Organic Matter content,	%	-	-						
Unconfined Compression Strength (kPa)			-	-						
Strain at failure (%)			-	-						

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

Checked by : A. B. Tan

97

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **24.11.14** Tested By : **Motiur** Checked by : **A. B. Tan**

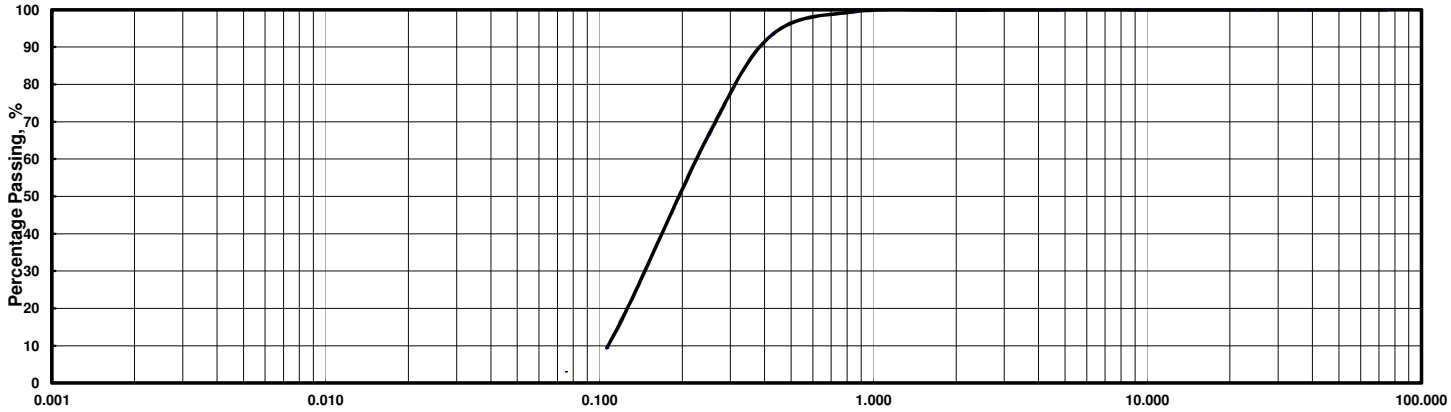
Sample No. : **OF-05-2 D-1** Depth : **1.00-1.80m** ( ) Specific Gravity : 2.77

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.5	93.2	66.6	9.4	3.0
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-05-2 D-1 1.00-1.80m			Sample No. Depth	OF-05-2 D-1 1.00-1.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm
4.75 - 2.00 mm	0.1	%		Dia. at 60%	0.23	mm
2.00 - 0.425 mm	6.6	%		Dia. at 30%	0.14	mm
0.425 - 0.075 mm	90.2	%		Dia. at 10%	0.11	mm
0.075 - 0.005 mm	3.0	%		Coeff. of Uniformity	2.12	
Smaller than 0.005 mm				Coeff. of Curvature	0.86	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.5	%				
75um Sieve Passing	3.0	%				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **26.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

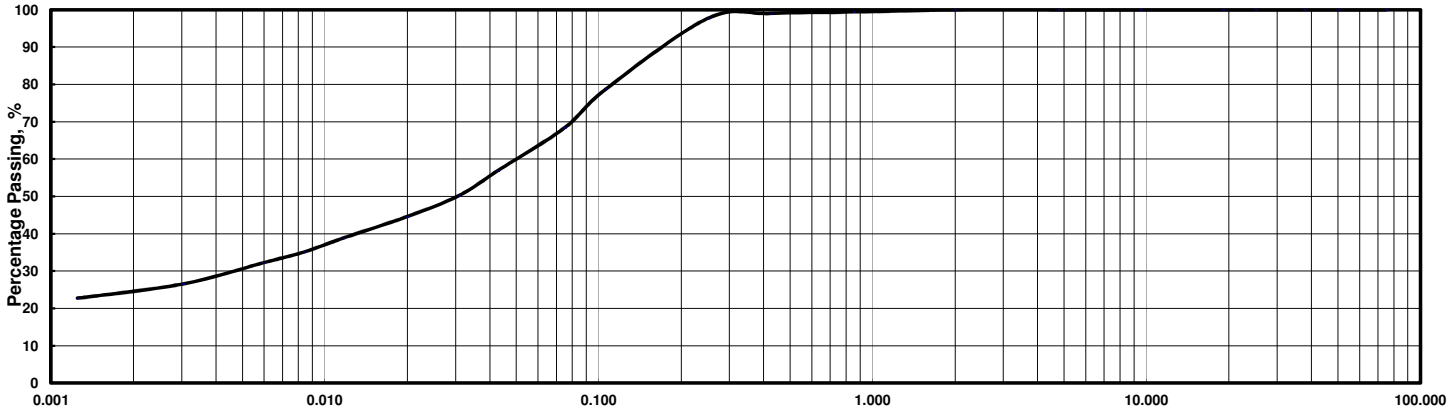
Sample No. : **OF-05-2 D-2** Depth : **3.00-3.80m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	99.0	97.7	78.7	68.4
Hydro.	Dia., mm	0.043	0.031	0.020	0.012	0.0083	0.0060	0.0030	0.0012							
	% Passing	56.8	50.2	44.5	38.8	35.1	32.2	26.5	22.7							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-2 D-2 3.00-3.80m			Sample No. Depth	OF-05-2 D-2 3.00-3.80m		
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.050	mm	
2.00 - 0.425 mm	1.0	%		Dia. at 30%	0.0046	mm	
0.425 - 0.075 mm	30.6	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	38.0	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	30.4	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.4	%					
75um Sieve Passing	68.4	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **26.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

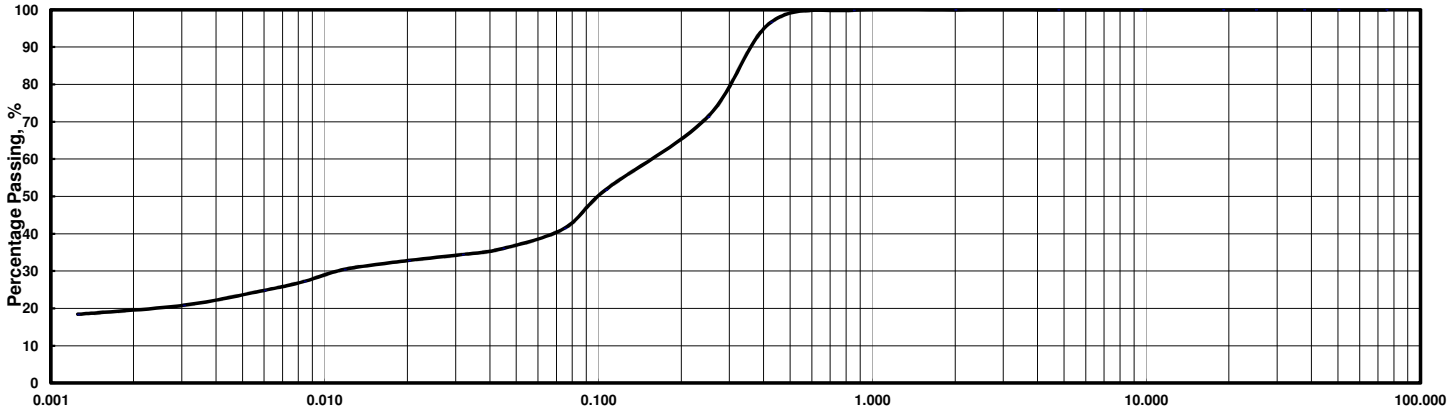
Sample No. : **OF-05-2 D-3** Depth : **5.00-5.80m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	96.6	71.3	51.8	41.5
Hydro.	Dia., mm	0.045	0.032	0.020	0.012	0.0084	0.0060	0.0030	0.0013							
	% Passing	36.0	34.4	32.8	30.4	27.2	24.8	20.8	18.4							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-05-2 D-3 5.00-5.80m		Sample No. Depth	OF-05-2 D-3 5.00-5.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.15 mm	
2.00 - 0.425 mm	3.4 %		Dia. at 30%	0.011 mm	
0.425 - 0.075 mm	55.2 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	18.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	23.5 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.9 %				
75um Sieve Passing	41.5 %				

Kiso-Jiban Consultants Co., Ltd.

100

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **26.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

(Assumed)

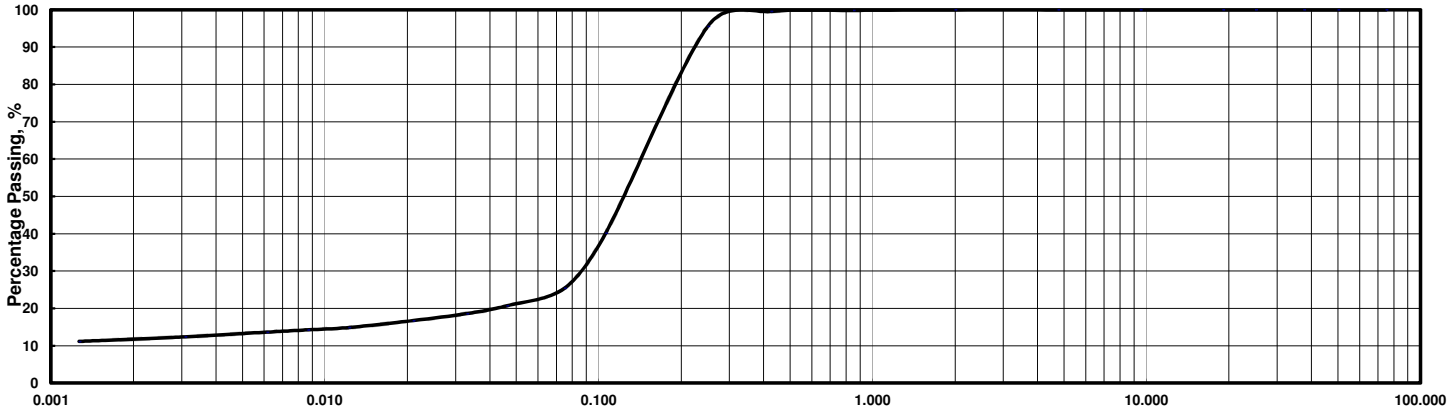
Sample No. : **OF-05-2 D-4** Depth : **7.00-7.80m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.5	95.5	40.1	25.4
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0087	0.0061	0.0031	0.0013							
	% Passing	20.7	18.6	16.7	14.9	14.3	13.6	12.4	11.2							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-2 D-4 7.00-7.80m			Sample No. Depth	OF-05-2 D-4 7.00-7.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.14	mm
2.00 - 0.425 mm	0.5	%		Dia. at 30%	0.084	mm
0.425 - 0.075 mm	74.1	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	12.2	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	13.2	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.8	%				
75um Sieve Passing	25.4	%				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **27.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

(Assumed)

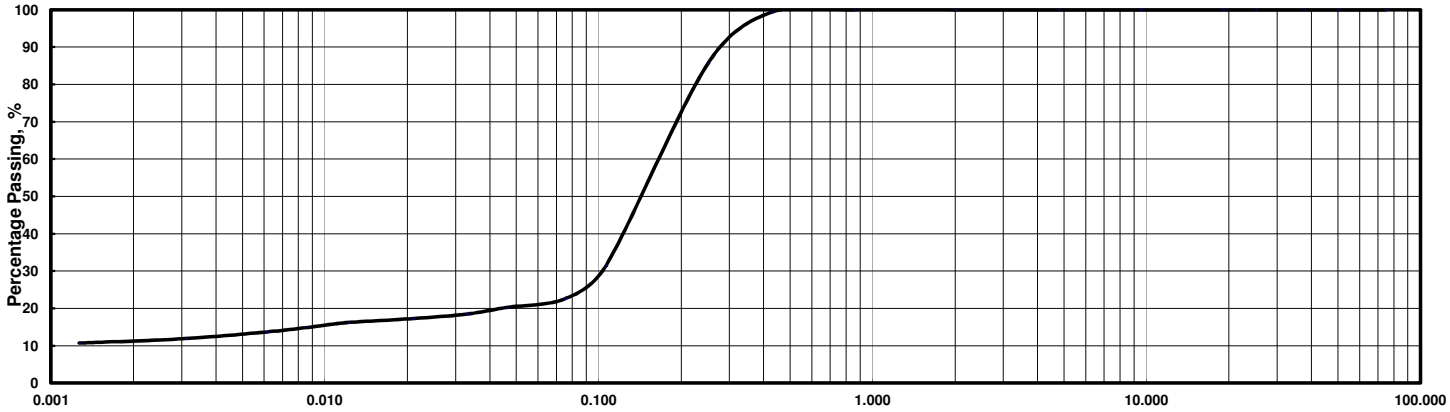
Sample No. : **OF-05-2 D-5** Depth : **10.00-10.50m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3	85.6	31.3	22.5
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	20.3	18.5	17.3	16.2	14.9	13.7	11.9	10.7							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-2 D-5 10.00-10.50m			Sample No. Depth	OF-05-2 D-5 10.00-10.50m		
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.17	mm	
2.00 - 0.425 mm	0.7	%		Dia. at 30%	0.10	mm	
0.425 - 0.075 mm	76.7	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	9.5	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	13.0	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	100.0	%					
75um Sieve Passing	22.5	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **24.11.14** Tested By : **Motiur** Checked by : **A. B. Tan**

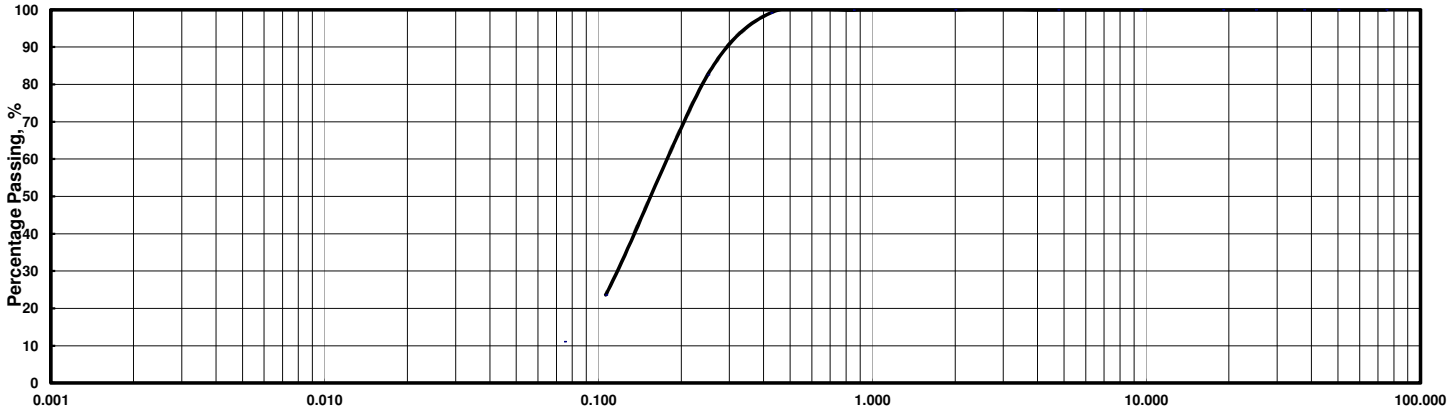
Sample No. : **OF-05-2 D-6** Depth : **10.50-11.30m** ( ) Specific Gravity :

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.2	82.6	23.6	11.2
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-2 D-6 10.50-11.30m			Sample No. Depth	OF-05-2 D-6 10.50-11.30m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.18	mm
2.00 - 0.425 mm	0.8	%		Dia. at 30%	0.12	mm
0.425 - 0.075 mm	88.0	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	11.2	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm				Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.9	%				
75um Sieve Passing	11.2	%				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **24.11.14** Tested By : **Motiur** Checked by : **A. B. Tan**

Sample No. : **OF-05-2 D-7** Depth : **14.00-14.80m** ( ) Specific Gravity :

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.5	99.0	97.6	81.2	30.1	16.1	12.1
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves

Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-2 D-7 14.00-14.80m		Sample No. Depth	OF-05-2 D-7 14.00-14.80m	
Larger than 4.75 mm	0.5 %		Max. Diameter	9.50 mm	
4.75 - 2.00 mm	0.5 %		Dia. at 60%	0.34 mm	
2.00 - 0.425 mm	17.8 %		Dia. at 30%	0.25 mm	
0.425 - 0.075 mm	69.1 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	12.1 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm			Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	97.6 %				
75um Sieve Passing	12.1 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **27.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

(Assumed)

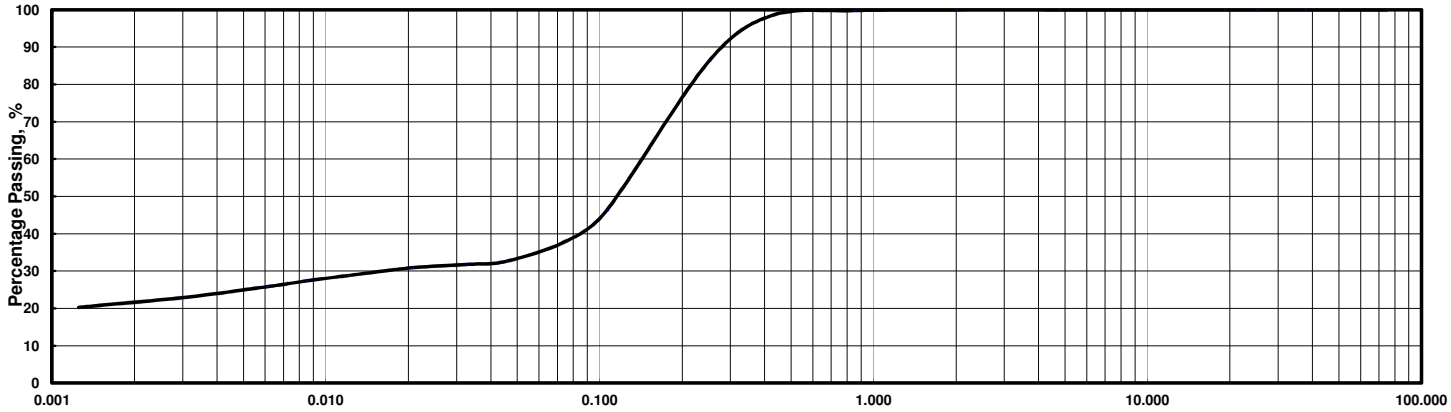
Sample No. : **OF-05-2 D-8** Depth : **17.00-17.80m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	98.4	86.2	46.3	37.9
Hydro.	Dia., mm	0.046	0.032	0.021	0.012	0.0085	0.0060	0.0030	0.0013							
	% Passing	32.6	31.8	30.9	28.8	27.3	25.8	22.9	20.3							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-05-2 D-8 17.00-17.80m		Sample No. Depth	OF-05-2 D-8 17.00-17.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.14 mm	
2.00 - 0.425 mm	1.6 %		Dia. at 30%	0.016 mm	
0.425 - 0.075 mm	60.5 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	13.1 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	24.8 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.7 %				
75um Sieve Passing	37.9 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **28.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

(Assumed)

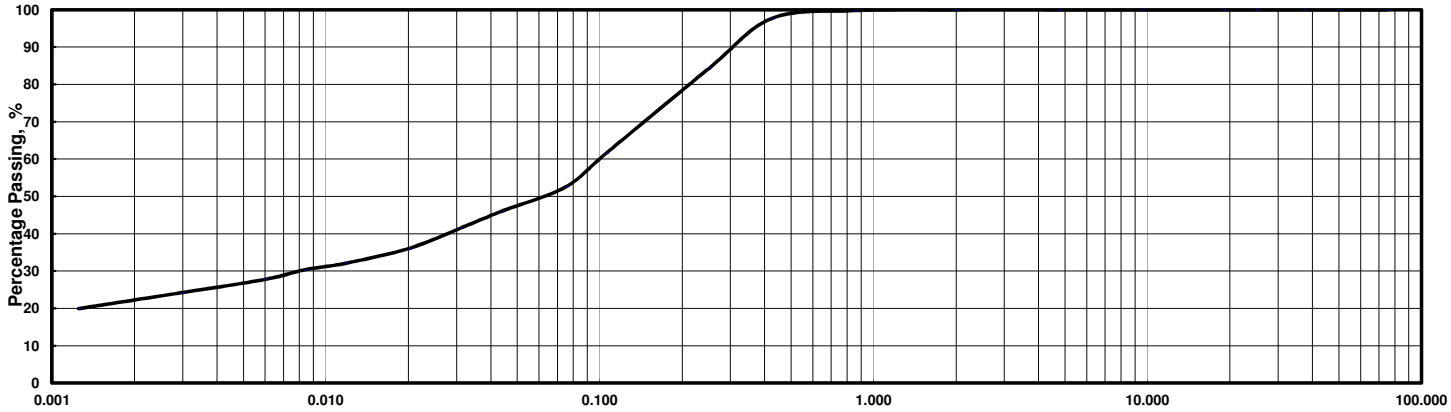
Sample No. : **OF-05-2 D-9** Depth : **20.00-20.80m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	97.7	84.3	61.7	52.5
Hydro.	Dia., mm	0.044	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0013							
	% Passing	46.0	41.6	36.1	32.1	30.4	27.8	24.3	20.0							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-05-2 D-9 20.00-20.80m			Sample No. Depth	OF-05-2 D-9 20.00-20.80m		
Larger than 4.75 mm	0.0	%		Max. Diameter	2.000	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.10	mm	
2.00 - 0.425 mm	2.3	%		Dia. at 30%	0.0080	mm	
0.425 - 0.075 mm	45.2	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	25.9	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	26.6	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.8	%					
75um Sieve Passing	52.5	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **28.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

(Assumed)

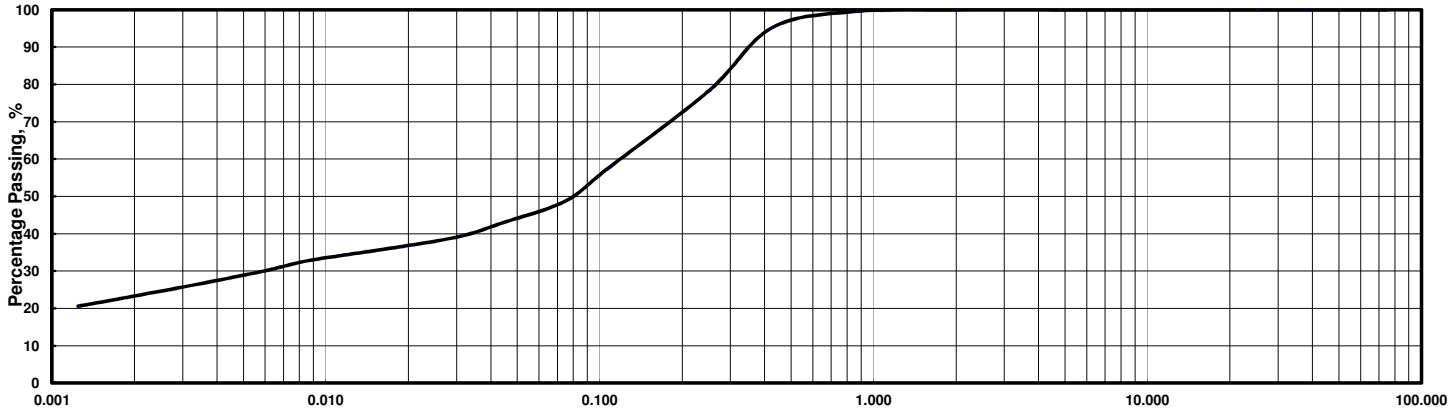
Sample No. : **OF-05-2 D-10** Depth : **23.00-23.75m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.5	95.2	78.2	57.3	48.7
Hydro.	Dia., mm	0.044	0.031	0.020	0.012	0.0083	0.0059	0.0030	0.0012							
	% Passing	42.8	39.4	36.8	34.3	32.6	30.0	25.7	20.6							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-05-2 D-10 23.00-23.75m		Sample No. Depth	OF-05-2 D-10 23.00-23.75m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.12 mm	
2.00 - 0.425 mm	4.8 %		Dia. at 30%	0.0059 mm	
0.425 - 0.075 mm	46.4 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	20.1 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	28.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.5 %				
75um Sieve Passing	48.7 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **28.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

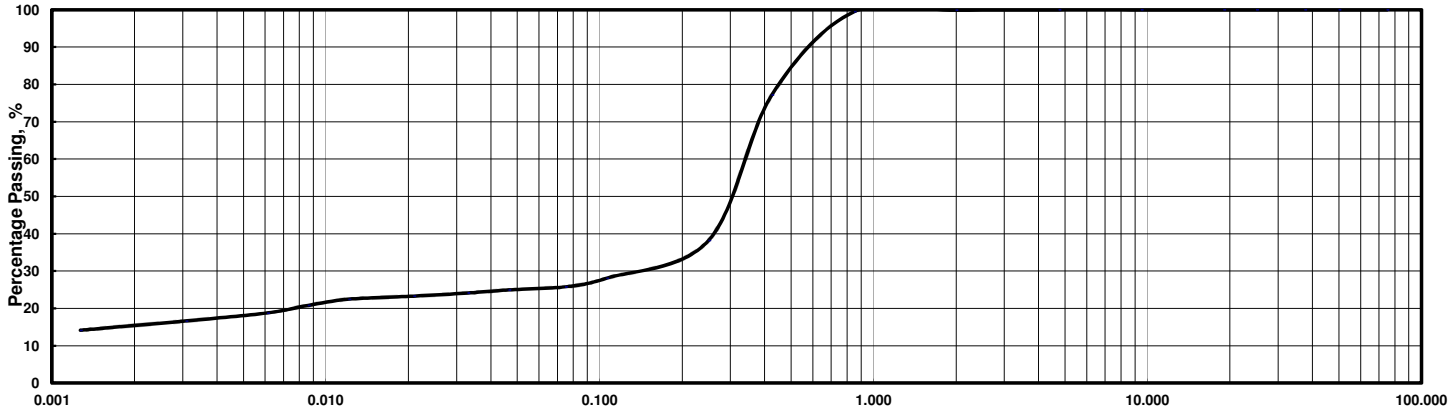
Sample No. : **OF-05-2 D-11** Depth : **25.00-25.50m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.5	77.2	38.2	28.1	25.8
Hydro.	Dia., mm	0.047	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	25.0	24.1	23.3	22.5	20.8	18.8	16.6	14.1							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-2 D-11 25.00-25.50m		Sample No. Depth	OF-05-2 D-11 25.00-25.50m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.1 %		Dia. at 60%	0.34 mm	
2.00 - 0.425 mm	22.7 %		Dia. at 30%	0.12 mm	
0.425 - 0.075 mm	51.4 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	7.8 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	18.0 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.5 %				
75um Sieve Passing	25.8 %				

Summary of Consolidated Drained Triaxial Compression Test

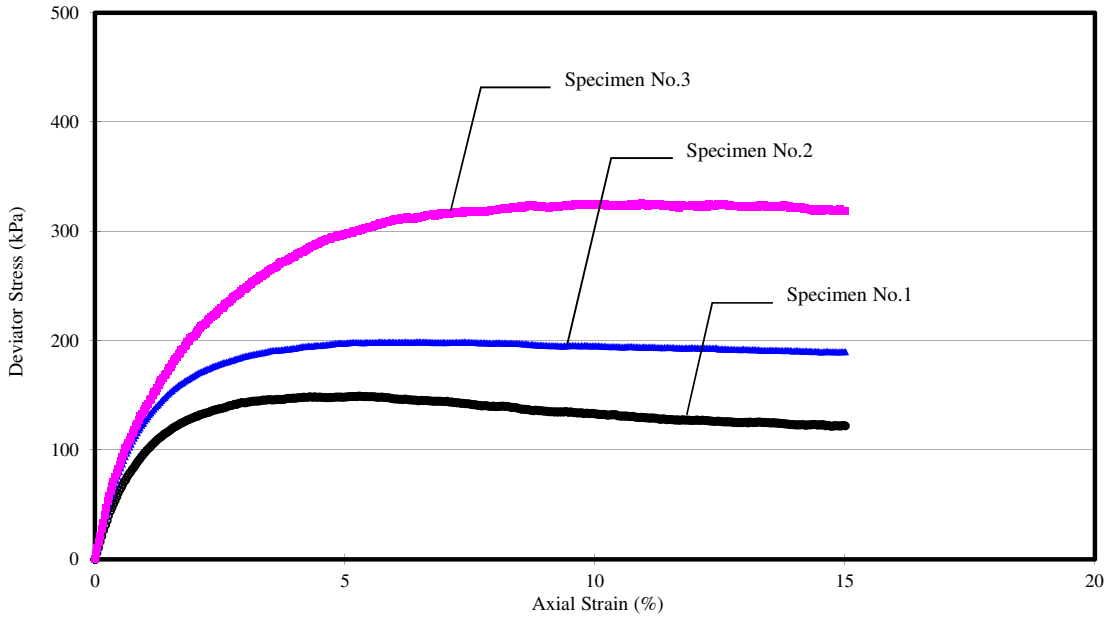
Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 05.12.14		Tested by : Perera		Checked by : A. B. Tan			
Borehole No.: OF-05-2		Sample No.:D-1		Depth : 1.00-1.80m			
Specimen Condition : Remoulded		Test Method : ASTM D7181-11					
Soil Description : Sand		Ave. Diameter : 50.0mm		Ave. Height : 99.9mm			
Specimen No.			1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.50	1.50	1.50		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	570	600		
	B-value		0.96	0.95	0.96		
Consolidation Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	529	557	587		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.05	0.11	0.22		
	Coefficient of Consolidation Cv,	m^2/year	362	388	285		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.011	0.016	0.022		
Compression Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	149	199	326		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-1.24	-0.46	0.32		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	5.27	6.61	10.93		
Shear Strength Parameters	ϕ_d = 38 Degree c_d = 0 kPa		Mode of Failure				
			1	2	3	4	

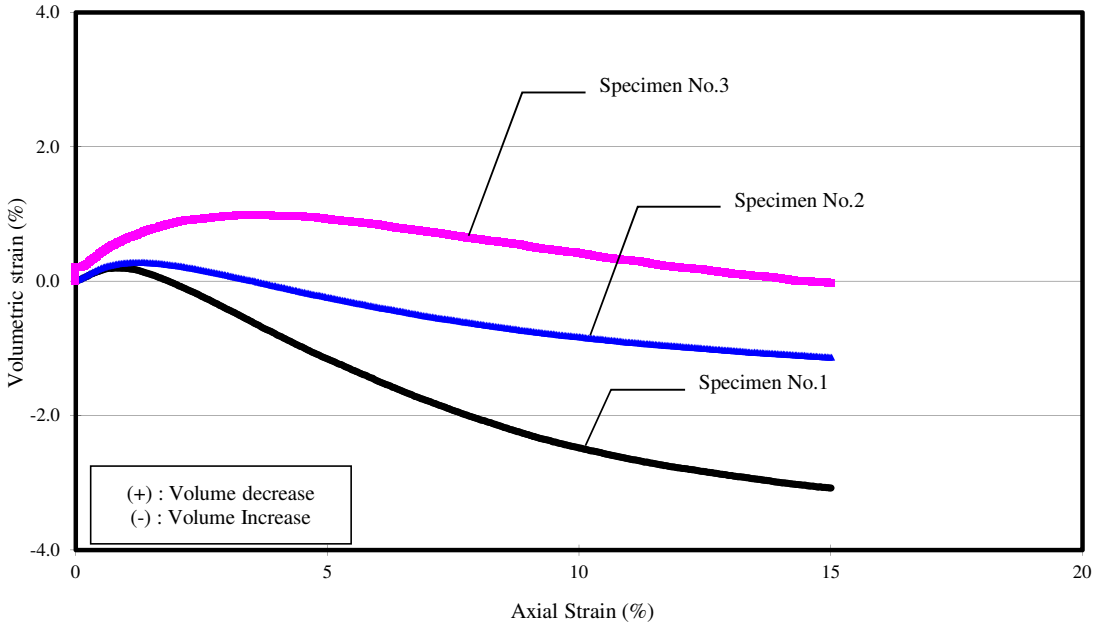
Remarks :

Specimens are prepared at 90% of Maximum dry density (from compaction Test) = 1.50 Mg/m^3

Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-1 Soil Type: Sand
Borehole No.: OF-05-2 Depth : 1.00-1.80m





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

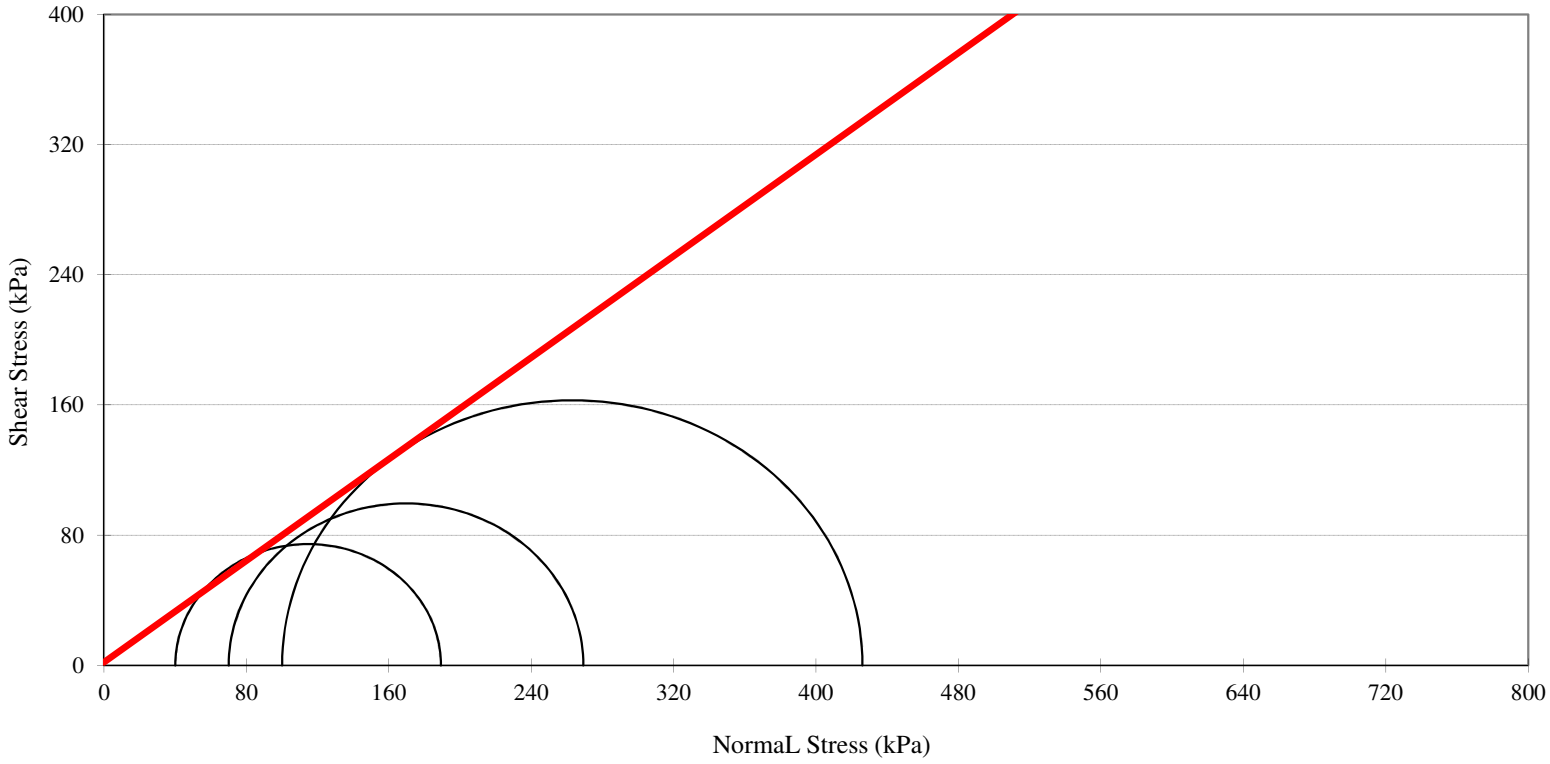
Project No. : S27-14

Borehole No. : OF-05-2 Soil Type: Sand

Sample No. : D-1 Depth : 1.00-1.80m

Angle of Internal Friction, ϕ_d 38 deg

Cohesion, c_d 0 kPa



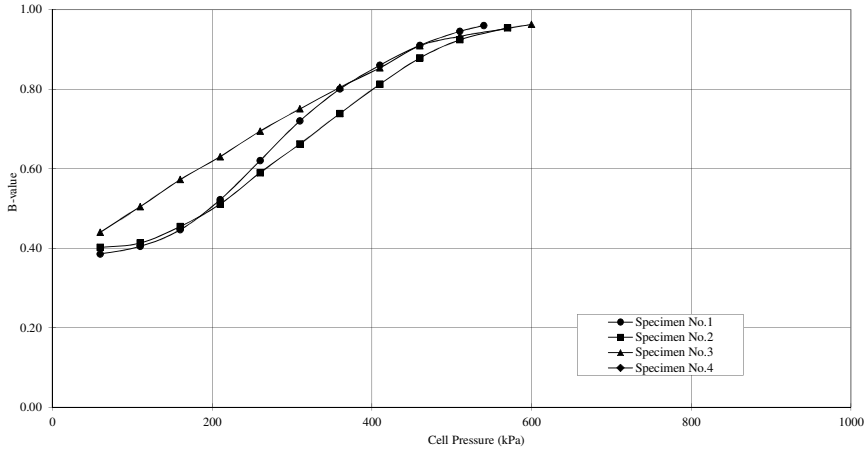
Kiso-Jiban Consultants Co., Ltd.

111

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

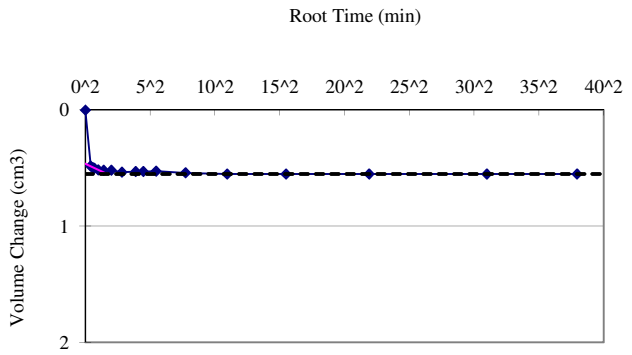
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: OF-05-2 Depth : 1.00-1.80m
Sample No.: D-1 Soil Type: Sand

		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	31.6	20	32.1	20	33.2		
	Back Pressure (kPa)	20		20		20			
	B-value	0.39		0.40		0.44			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	70.2	50	70.7	50	75.2		
	Back Pressure (kPa)	50		50		50			
	B-value	0.40		0.41		0.50			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	122.3	100	122.7	100	128.6		
	Back Pressure (kPa)	100		100		100			
	B-value	0.45		0.45		0.57			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	176.1	150	175.5	150	181.5		
	Back Pressure (kPa)	150		150		150			
	B-value	0.52		0.51		0.63			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	231.0	200	229.5	200	234.7		
	Back Pressure (kPa)	200		200		200			
	B-value	0.62		0.59		0.69			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	286.0	250	283.1	250	287.5		
	Back Pressure (kPa)	250		250		250			
	B-value	0.72		0.66		0.75			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	340.0	300	336.9	300	340.2		
	Back Pressure (kPa)	300		300		300			
	B-value	0.80		0.74		0.80			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	393.0	350	390.6	350	392.7		
	Back Pressure (kPa)	350		350		350			
	B-value	0.86		0.81		0.85			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	445.5	400	443.9	400	445.4		
	Back Pressure (kPa)	400		400		400			
	B-value	0.91		0.88		0.91			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	497.3	450	496.2	450	496.6		
	Back Pressure (kPa)	450		450		450			
	B-value	0.95		0.92		0.93			
B-check Step.11	Cell Pressure (kPa)	510	540	510	570	510	600		
	P.W.P (kPa)	500	528.8	500	557.2	500	586.6		
	Back Pressure (kPa)	500		500		500			
	B-value	0.96		0.95		0.96			



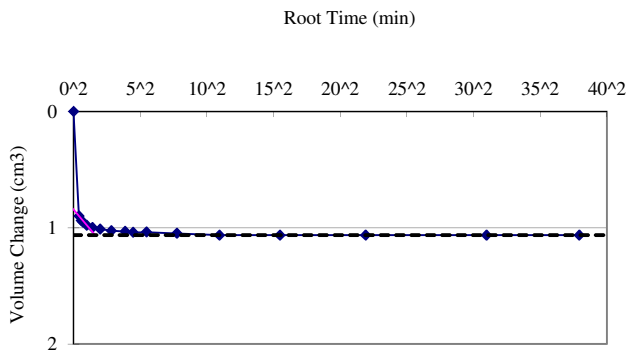
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: OF-05-2 Soil Type: Sand
Sample No.: D-1 Depth : 1.00-1.80m



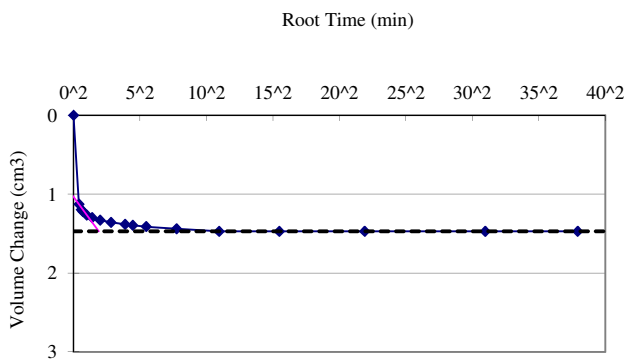
Specimen No.: 1

p' =	40	kPa
t100 =	2.8	min
Cv =	362	m^2/year
mvi=	0.011	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	2.7	min
Cv =	388	m^2/year
mvi=	0.016	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	3.6	min
Cv =	285	m^2/year
mvi=	0.022	m^2/MN

Summary of Consolidated Drained Triaxial Compression Test

Project No.: S27-14	Project :Preparatory Survey on Matarbari USC Coral-fired Power Project		
Date Tested : 04.12.14	Tested by : Perera	Checked by : A. B. Tan	
Borehole No.: OF-05-02	Sample No.:D-3	Depth : 5.00-5.80m	
Specimen Condition : Remoulded	Test Method : ASTM D7181-11		
Soil Description : Clayey Sand	Ave. Diameter : 50.0mm	Ave. Height : 100.0mm	

	Specimen No.		1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.72	1.72	1.72		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	570	600		
	B-value		0.95	0.96	0.97		
Consolidation Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	528	558	587		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.14	0.54	1.45		
	Coefficient of Consolidation Cv,	m^2/year	703	587	151		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.034	0.078	0.145		
Compression Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	127	198	279		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	1.83	3.96	2.97		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	14.56	14.92	13.31		
Shear Strength Parameters	ϕ_d = 36 Degree c_d = 0 kPa		Mode of Failure				

1 2 3 4

Remarks :

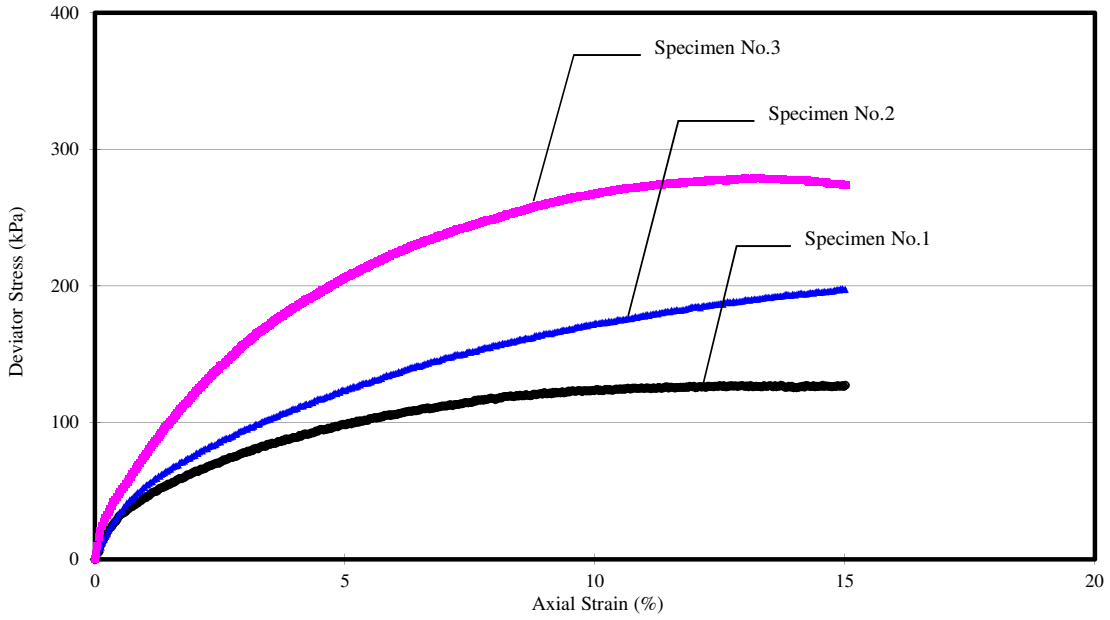
Specimens are prepared at 90% of Maximum dry density (from compaction Test) = 1.72 Mg/m^3

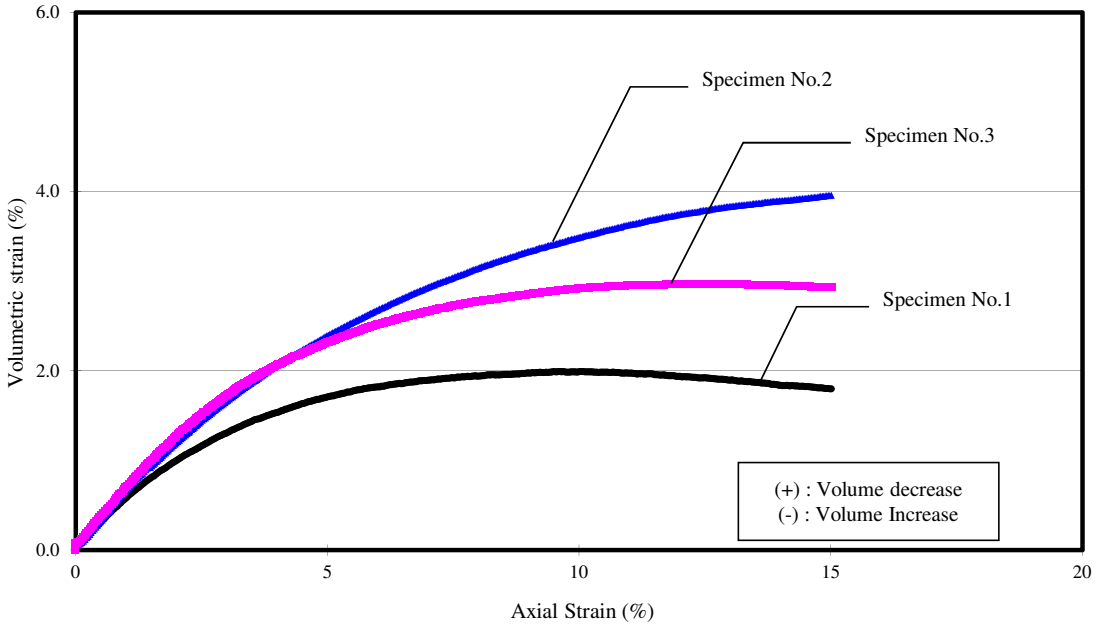
Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No.: S27-14 Sample No.: D-3 Soil Type: Clayey Sand

Borehole No.: OF-05-02 Depth : 5.00-5.80m





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

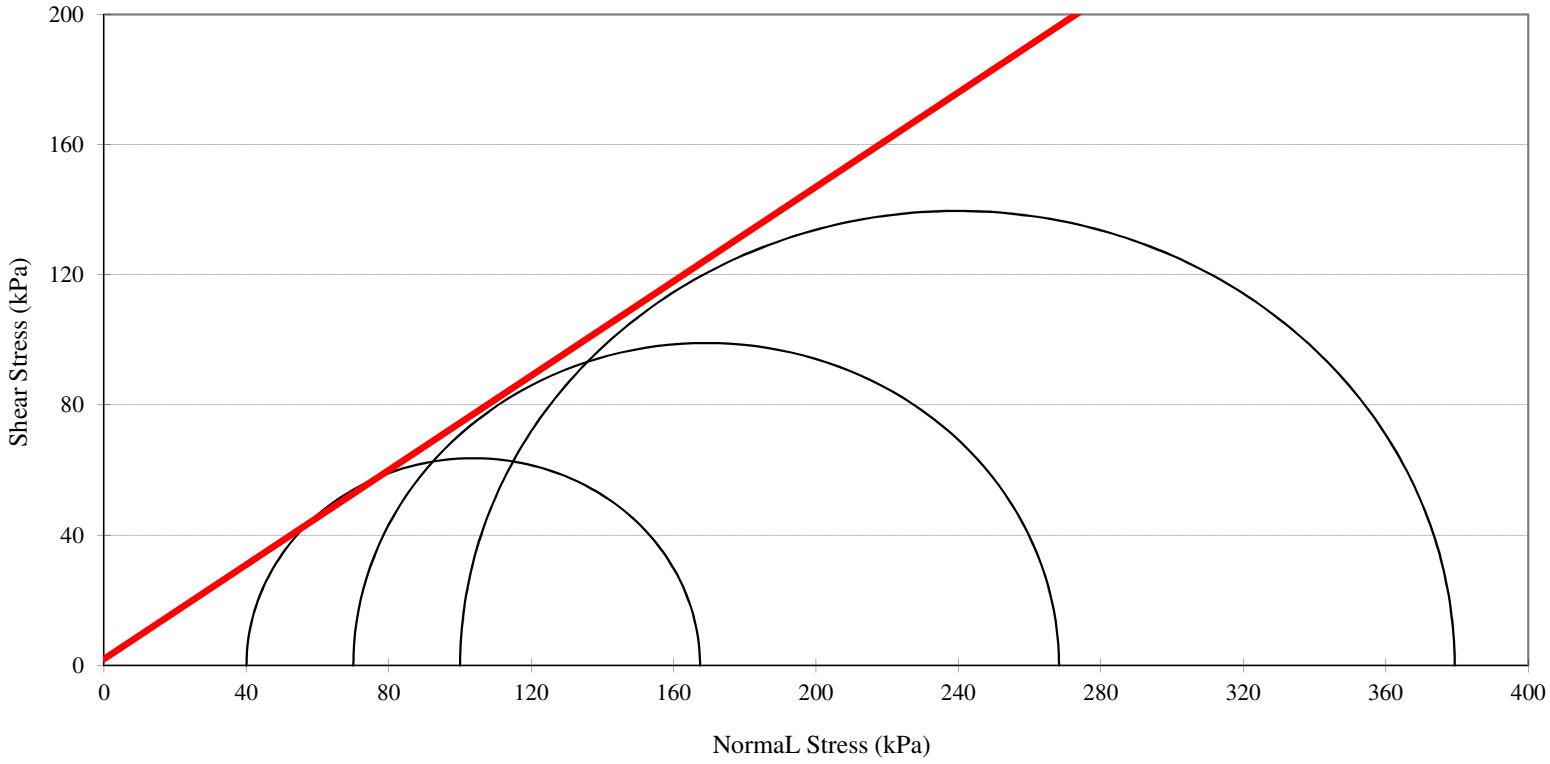
Project No. : S27-14

Borehole No. : OF-05-02 Soil Type: Clayey Sand

Sample No. : D-3 Depth : 5.00-5.80m

Angle of Internal Friction, ϕ_d 36 deg

Cohesion, c_d 0 kPa



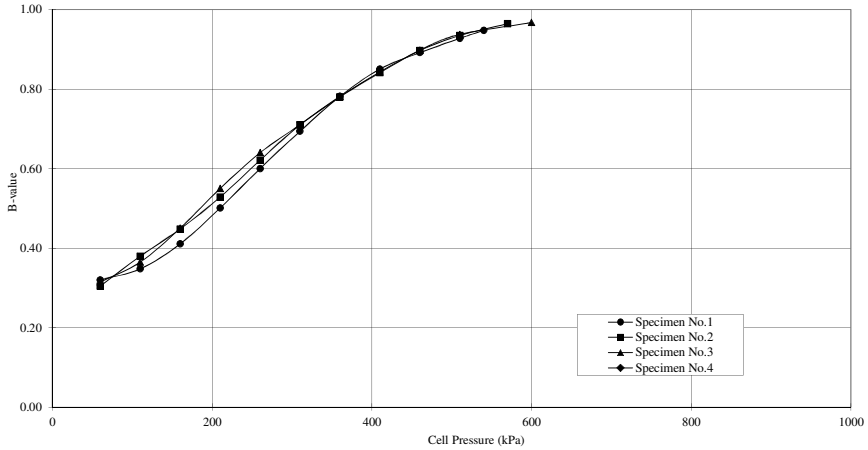
Kiso-Jiban Consultants Co., Ltd.

116

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

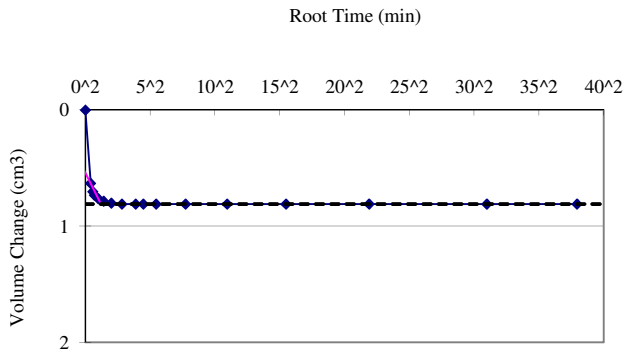
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: OF-05-02 Depth : 5.00-5.80m
Sample No.: D-3 Soil Type: Clayey Sand

		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	29.6	20	29.1	20	29.5		
	Back Pressure (kPa)	20		20		20			
	B-value	0.32		0.30		0.32			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	67.4	50	69.0	50	68.2		
	Back Pressure (kPa)	50		50		50			
	B-value	0.35		0.38		0.36			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	120.5	100	122.4	100	122.5		
	Back Pressure (kPa)	100		100		100			
	B-value	0.41		0.45		0.45			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	175.1	150	176.4	150	177.5		
	Back Pressure (kPa)	150		150		150			
	B-value	0.50		0.53		0.55			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	230.0	200	231.1	200	232.0		
	Back Pressure (kPa)	200		200		200			
	B-value	0.60		0.62		0.64			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	284.7	250	285.5	250	285.5		
	Back Pressure (kPa)	250		250		250			
	B-value	0.69		0.71		0.71			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	339.1	300	339.0	300	339.1		
	Back Pressure (kPa)	300		300		300			
	B-value	0.78		0.78		0.78			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	392.5	350	392.2	350	392.1		
	Back Pressure (kPa)	350		350		350			
	B-value	0.85		0.84		0.84			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	444.6	400	444.8	400	444.9		
	Back Pressure (kPa)	400		400		400			
	B-value	0.89		0.90		0.90			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	496.4	450	496.7	450	496.9		
	Back Pressure (kPa)	450		450		450			
	B-value	0.93		0.93		0.94			
B-check Step.11	Cell Pressure (kPa)	510	540	510	570	510	600		
	P.W.P (kPa)	500	528.4	500	557.9	500	587.1		
	Back Pressure (kPa)	500		500		500			
	B-value	0.95		0.96		0.97			



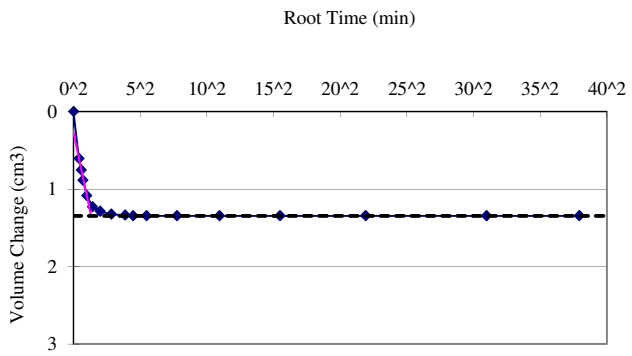
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: OF-05-02 Soil Type: Clayey Sand
Sample No.: D-3 Depth : 5.00-5.80m



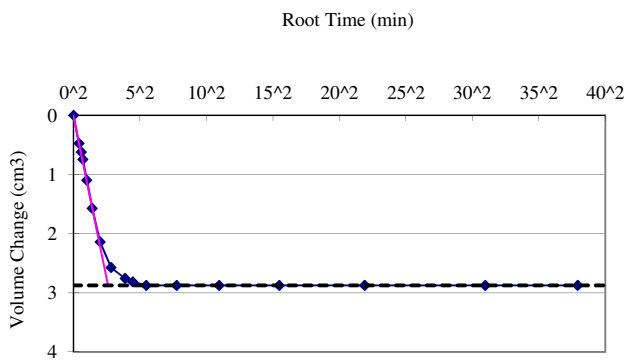
Specimen No.: 1

p' =	40	kPa
t100 =	1.5	min
Cv =	703	m^2/year
mvi=	0.034	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	1.8	min
Cv =	587	m^2/year
mvi=	0.078	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	6.8	min
Cv =	151	m^2/year
mvi=	0.145	m^2/MN

Summary of Consolidated Drained Triaxial Compression Test

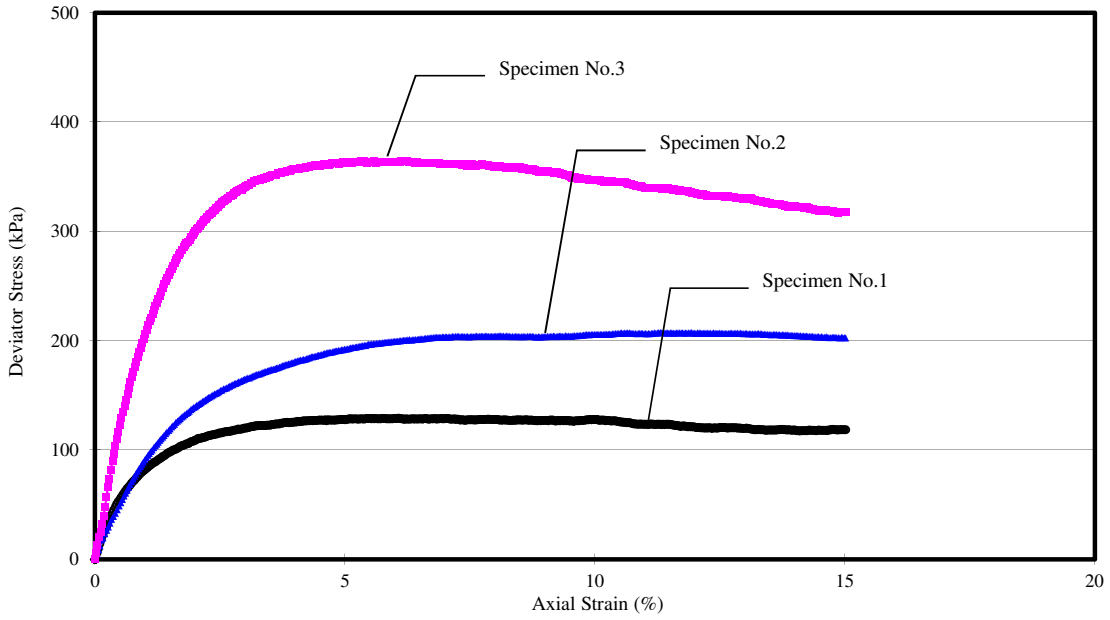
Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 08.12.14		Tested by : Perera		Checked by : A. B. Tan			
Borehole No.: OF-05-02		Sample No.:D-7		Depth : 14.00-14.80m			
Specimen Condition : Remoulded		Test Method : ASTM D7181-11					
Soil Description : Clayey Sand		Ave. Diameter : 50.0mm		Ave. Height : 100.0mm			
Specimen No.			1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.61	1.61	1.61		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	570	600		
	B-value		0.97	0.96	0.95		
Consolidation Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	529	558	585		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.05	0.23	0.09		
	Coefficient of Consolidation Cv,	m^2/year	441	350	299		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.012	0.033	0.009		
Compression Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	129	208	364		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-1.34	-0.33	-1.07		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	6.07	11.31	6.15		
Shear Strength Parameters	ϕ_d = 39 Degree c_d = 0 kPa		Mode of Failure				
			1	2	3	4	

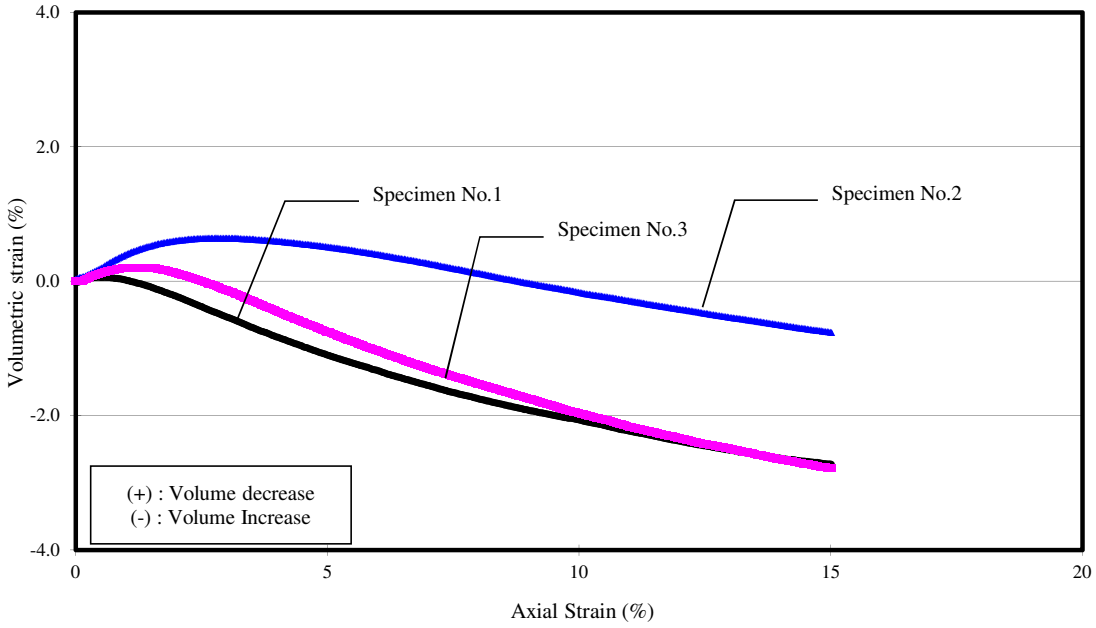
Remarks :

Specimens are prepared at 90% of Maximum dry density (from compaction Test)= 1.61 Mg/m^3

Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-7 Soil Type: Clayey Sand
Borehole No.: OF-05-02 Depth : 14.00-14.80m





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

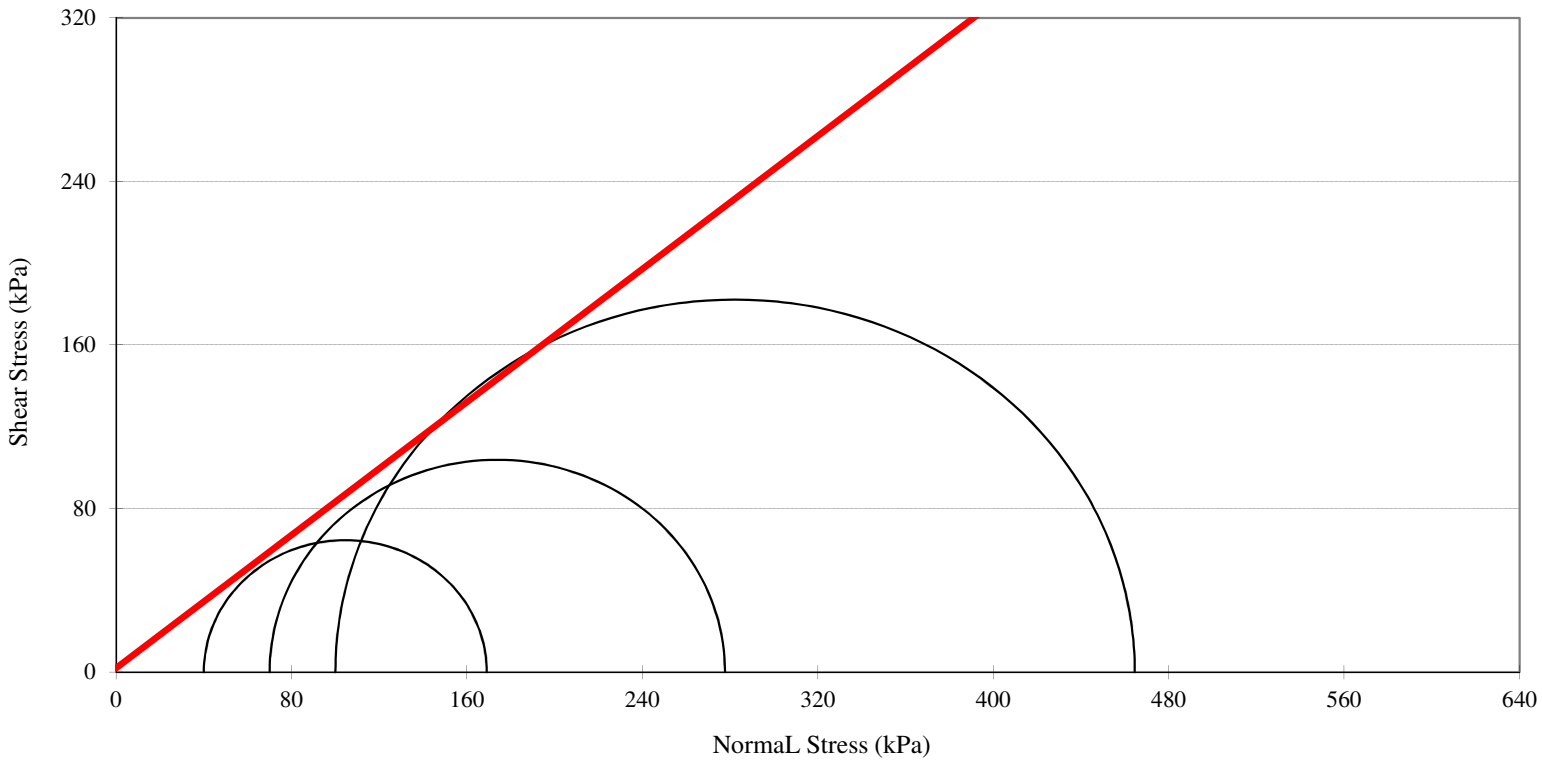
Project No. : S27-14

Borehole No. : OF-05-02 Soil Type: Clayey Sand

Sample No. : D-7 Depth : 14.00-14.80m

Angle of Internal Friction, ϕ_d 39 deg

Cohesion, c_d 0 kPa



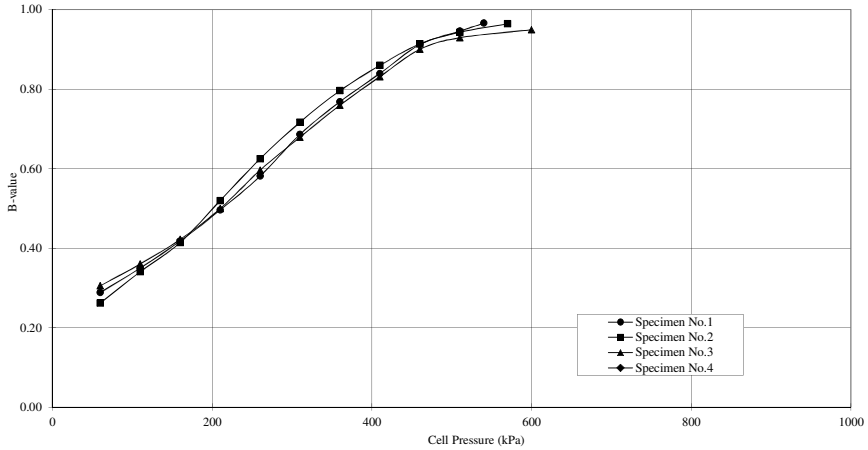
Kiso-Jiban Consultants Co., Ltd.

121

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

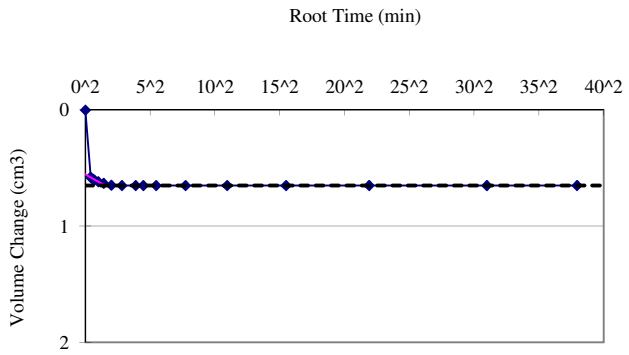
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: OF-05-02 Depth : 14.00-14.80m
Sample No.: D-7 Soil Type: Clayey Sand

		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	28.7	20	27.9	20	29.2		
	Back Pressure (kPa)	20		20		20			
	B-value	0.29		0.26		0.31			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	67.5	50	67.0	50	68.0		
	Back Pressure (kPa)	50		50		50			
	B-value	0.35		0.34		0.36			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	120.9	100	120.7	100	121.1		
	Back Pressure (kPa)	100		100		100			
	B-value	0.42		0.41		0.42			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	174.8	150	176.0	150	175.0		
	Back Pressure (kPa)	150		150		150			
	B-value	0.50		0.52		0.50			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	229.1	200	231.2	200	229.8		
	Back Pressure (kPa)	200		200		200			
	B-value	0.58		0.62		0.60			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	284.3	250	285.8	250	284.0		
	Back Pressure (kPa)	250		250		250			
	B-value	0.69		0.72		0.68			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	338.4	300	339.8	300	338.0		
	Back Pressure (kPa)	300		300		300			
	B-value	0.77		0.80		0.76			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	392.0	350	393.0	350	391.6		
	Back Pressure (kPa)	350		350		350			
	B-value	0.84		0.86		0.83			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	445.6	400	445.7	400	445.0		
	Back Pressure (kPa)	400		400		400			
	B-value	0.91		0.91		0.90			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	497.3	450	497.2	450	496.5		
	Back Pressure (kPa)	450		450		450			
	B-value	0.95		0.94		0.93			
B-check Step.11	Cell Pressure (kPa)	510	540	510	570	510	600		
	P.W.P (kPa)	500	529.0	500	557.9	500	585.4		
	Back Pressure (kPa)	500		500		500			
	B-value	0.97		0.96		0.95			



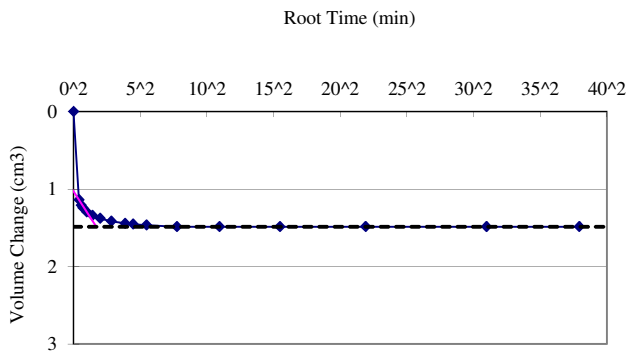
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: OF-05-02 Soil Type: Clayey Sand
Sample No.: D-7 Depth : 14.00-14.80m



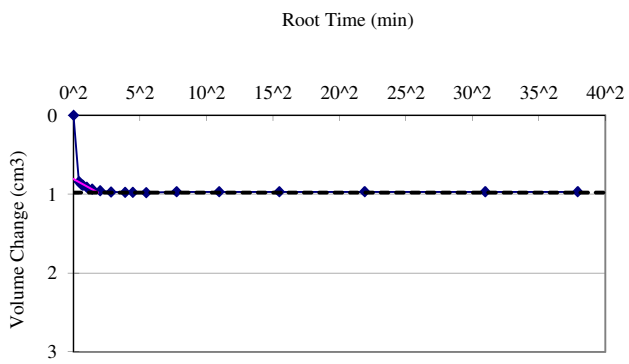
Specimen No.: 1

p' =	40	kPa
t100 =	2.3	min
Cv =	441	m^2/year
mvi=	0.012	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	2.9	min
Cv =	350	m^2/year
mvi=	0.033	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	3.5	min
Cv =	299	m^2/year
mvi=	0.009	m^2/MN

RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

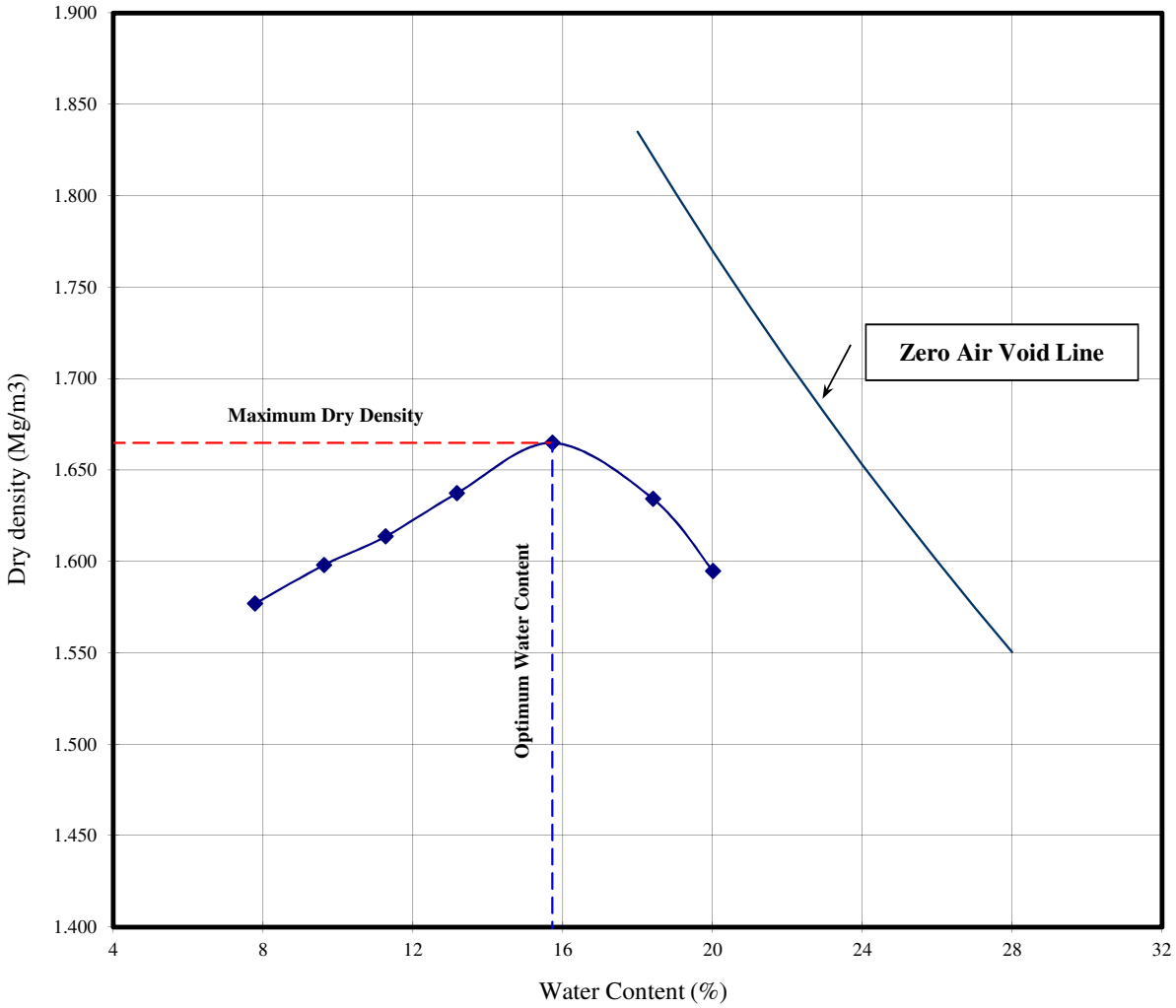
Sampling Date : - **Date of Testing :** 23-Nov-14 **Tested by :** Perera/Bala

Sample No. : OF-05-2 D-1(1.00-1.80m) **Ref. No.** -

Soil Type :	Silty Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.74	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	7.8	9.6	11.3	13.2	15.7	18.4	20.0	
Wet Density (Mg/m3)	1.700	1.752	1.796	1.853	1.927	1.935	20.009	
Dry Density (Mg/m3)	1.577	1.598	1.614	1.637	1.665	1.634	1.595	

Maximum Dry Density	**1.665 Mg/m3**
Optimum Water Content	**15.7 %**



RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

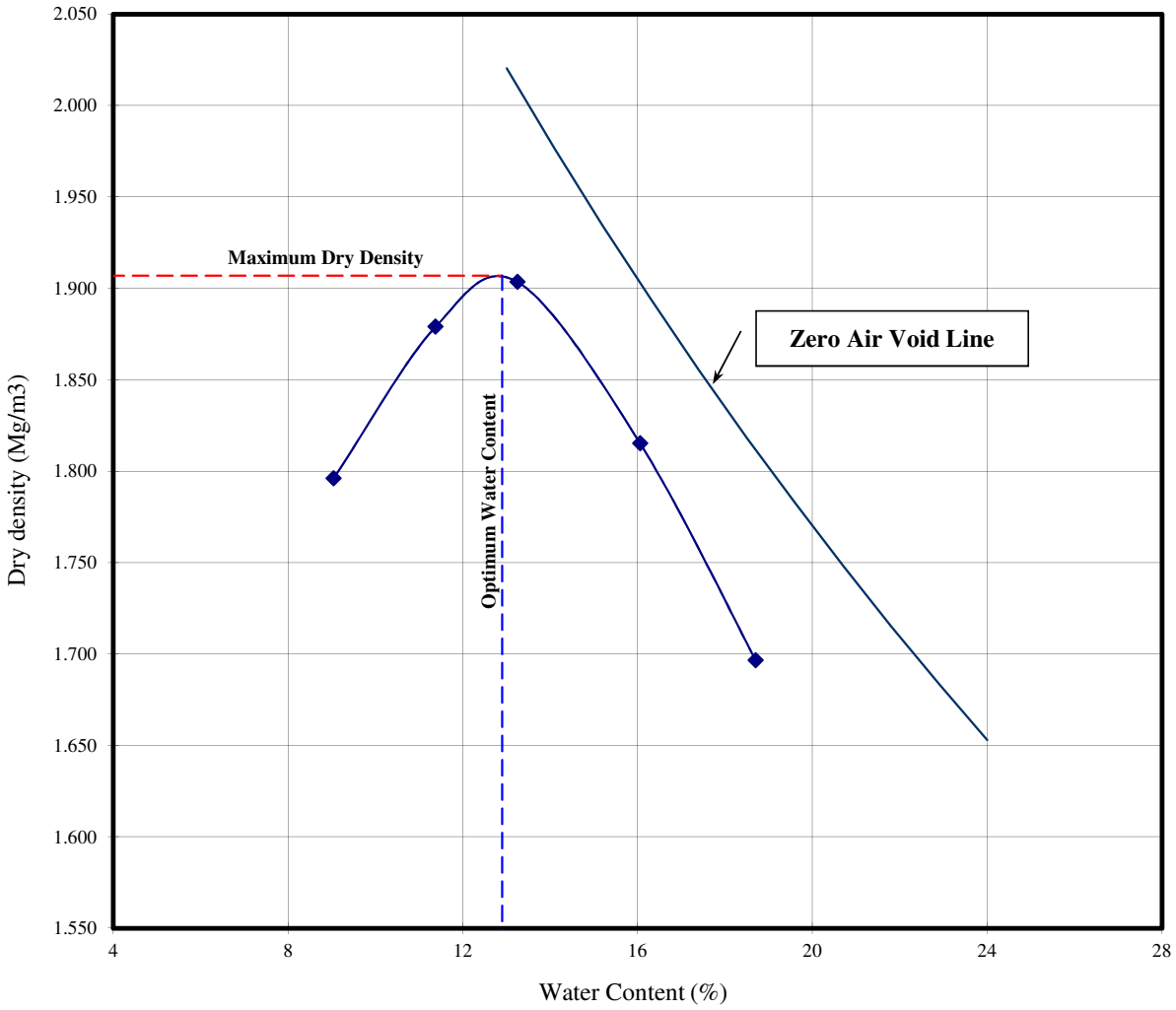
Sampling Date : - **Date of Testing :** 23-Nov-14 **Tested by :** Perera/Bala

Sample No. : OF-05-02 D-3 (5.00-5.80m) **Ref. No.** -

Soil Type :	Silty Clay with Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.74	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	9.0	11.4	13.2	16.1	18.7			
Wet Density (Mg/m3)	1.959	2.093	2.156	2.107	2.014			
Dry Density (Mg/m3)	1.796	1.879	1.903	1.815	1.697			

Maximum Dry Density	**1.907 Mg/m3**
Optimum Water Content	**12.9 %**



125

RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

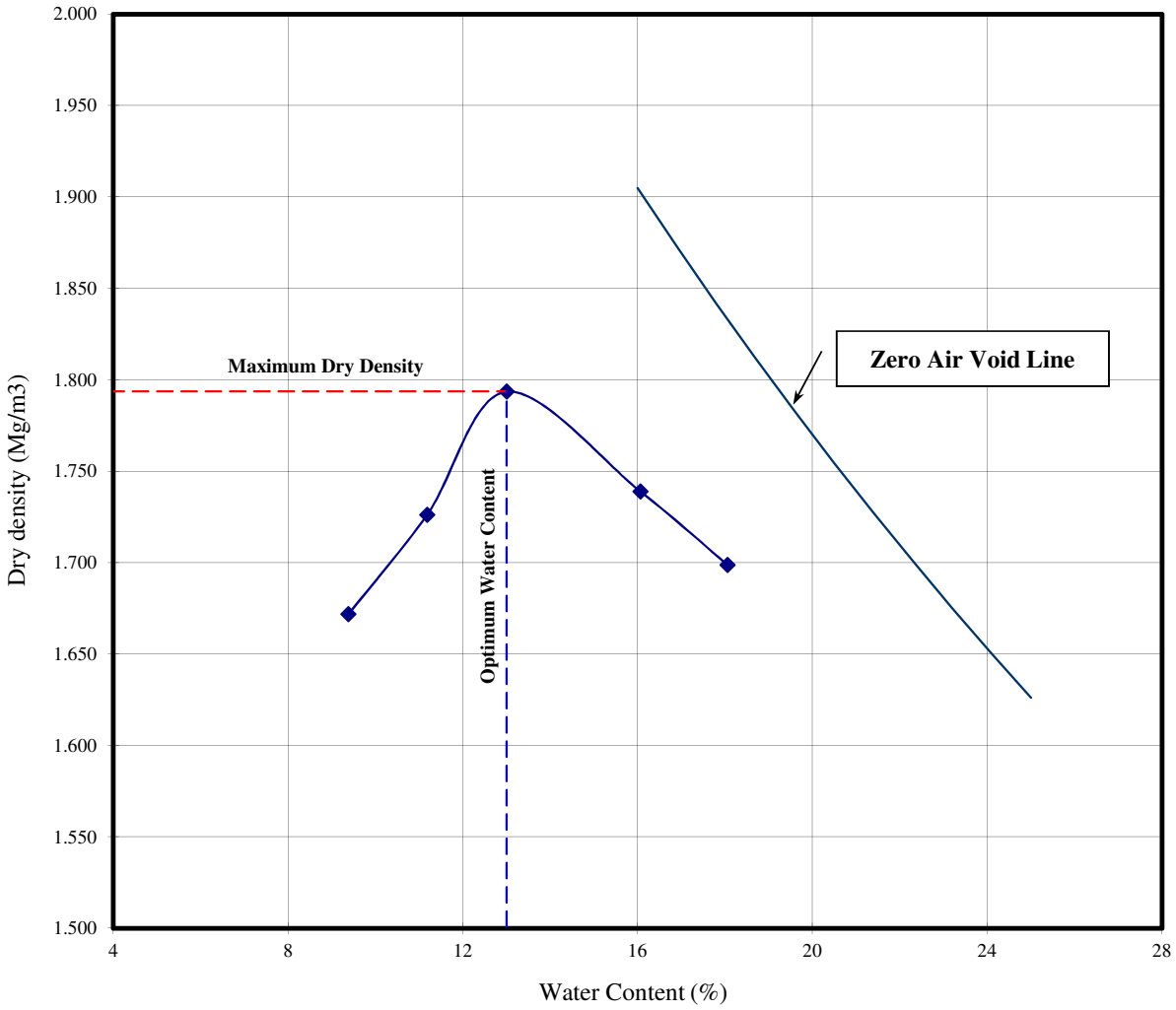
Sampling Date : - **Date of Testing :** 28-Nov-14 **Tested by :** Perera/Bala

Sample No. : OF-05-02 D-7(14.00-14.80m) **Ref. No.** -

Soil Type :	Silty Clay with Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.74	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	9.4	11.2	13.0	16.1	18.1			
Wet Density (Mg/m3)	1.829	1.919	2.027	2.018	2.005			
Dry Density (Mg/m3)	1.672	1.726	1.794	1.739	1.699			

Maximum Dry Density	**1.794 Mg/m3**
Optimum Water Content	**13.0 %**



13) OF-05-3

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			OF-05-3								
Sample No.			D-1	D-2	D-3	D-4	D-5	D-6	D-7		
Sample Depth			2.00m ~2.80m	5.00m ~5.80m	8.00m ~8.90m	11.00m ~11.60m	14.00m ~14.60m	17.00m ~17.60m	20.00m ~20.70m		
Condition of Sample			Disturbed								
Natural Water Content		%	33.6	27.8	22.3	14.9	17.2	25.8	21.3		
Specific Gravity			2.74	2.71	2.70	2.68	2.67	2.71	2.69		
Wet Density		Mg/m^3	1.83	1.95	-	-	-	1.89	-		
Dry Density		Mg/m^3	1.37	1.52	-	-	-	1.50	-		
Natural Void Ratio			1.00	0.78	-	-	-	0.80	-		
Degree of Saturation		%	92	97	-	-	-	87	-		
Atterberg Limits	Liquid Limit,	%	31	- *3	- *3	- *3	- *3	24	- *3		
	Plastic Limit,	%	18	- *3	- *3	- *3	- *3	17	- *3		
	Plasticity Index,	%	13	- *3	- *3	- *3	- *3	7	- *3		
Grain Size Analysis	Gravel,	%	0	0	0	0	0	0	0		
	Sand,	%	29	45	60	95	95	44	63		
	Silt,	%	30	29	17	5	5	29	16		
	Clay & Colloid,	%	41	26	23			27	21		
	Max. diameter,	mm	0.850	0.425	2.00	4.75	0.850	4.75	2.00		
	Diam. at 60%	mm	0.030	0.088	0.15	0.31	0.34	0.097	0.19		
	Diam. at 10%	mm	-	-	-	0.11	0.11	-	-		
Visual soil description			Clay with Sand	Sandy Clay	Clayey Sand	Sand	Sand	Sandy Silty Clay	Clayey Sand		
Unified soil classification			CL	-	-	-	-	CL-ML	-		
Triaxial compression test	Angle of Internal Friction	(^{0})	-	-	-	-	-	-	-		
	Cohesion Intercept, kPa		-	-	-	-	-	-	-		
	Condition of drainage		-	-	-	-	-	-	-		
	Angle of Internal Friction *2	(^{0})	-	-	-	-	-	-	-		
	Cohesion Intercept, kPa *2		-	-	-	-	-	-	-		
	Condition of drainage		-	-	-	-	-	-	-		
Consolidation Test	Preconsolidation Pressure,	kPa	-	-	-	-	-	-	-		
	Compression Index(Average)		-	-	-	-	-	-	-		
	Pressure Range for Compression Index(kPa)		-	-	-	-	-	-	-		
	Swell index		-	-	-	-	-	-	-		
Chemical Test	pH value		-	-	-	-	-	-	-		
	Total sulphate content as SO_3,	%	-	-	-	-	-	-	-		
	Chloride content as Cl,	%	-	-	-	-	-	-	-		
	Organic Matter content,	%	-	-	-	-	-	-	-		
Unconfined Compression Strength (kPa)			-	-	-	-	-	-	-		
Strain at failure (%)			-	-	-	-	-	-	-		

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No. : S27-14

Standard : ASTM D4318-10

Date of Testing : 01.12.14

Tested By : Vasantha

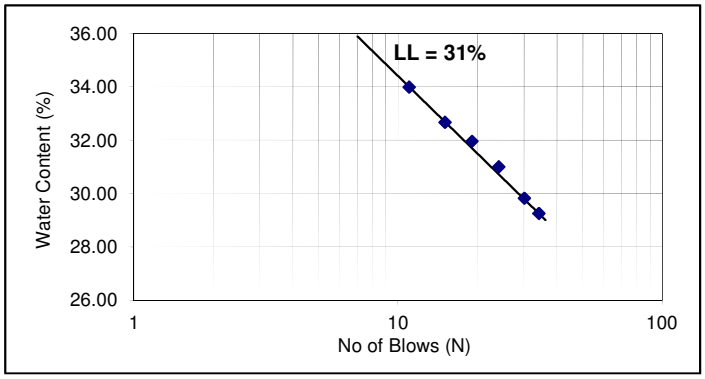
Checked By : A. B. Tan

Sample No. : OF-05-3 D-1

Depth : 2.00-2.80m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	34	29.25
2	30	29.82
3	24	31.00
4	19	31.96
5	15	32.67
6	11	33.98
Liquid Limits %		**31**
Plastic Limits %		**18**
Plasticity Index		**13**

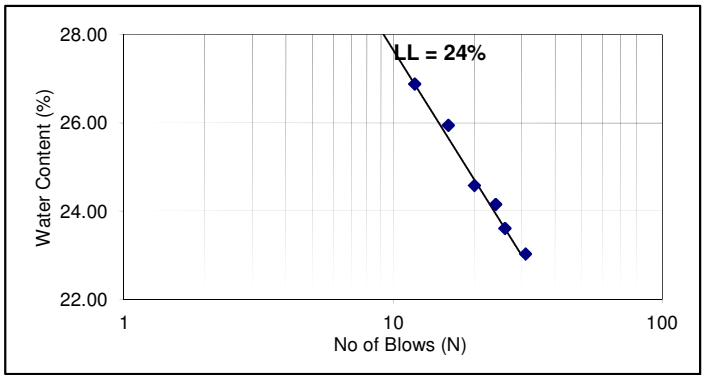


Sample No. : OF-05-3 D-6

Depth : 17.00-17.60m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	31	23.03
2	26	23.61
3	24	24.15
4	20	24.58
5	16	25.94
6	12	26.88
Liquid Limits %		**24**
Plastic Limits %		**17**
Plasticity Index		**7**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **29.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

Sample No. : **OF-05-3 D-1** Depth : **2.00-2.80m** (_____) Specific Gravity : 2.74

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1	93.7	76.3	70.7
Hydro.	Dia., mm	0.041	0.030	0.019	0.011	0.0080	0.0057	0.0029	0.0009							
	% Passing	63.7	60.0	57.2	52.5	47.4	43.1	35.6	27.2							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-05-3 D-1 2.00-2.80m		Sample No. Depth	OF-05-3 D-1 2.00-2.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.030 mm	
2.00 - 0.425 mm	0.9 %		Dia. at 30%	0.0013 mm	
0.425 - 0.075 mm	28.5 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	29.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	41.2 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	70.7 %				

Kiso-Jiban Consultants Co., Ltd.

130

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **29.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

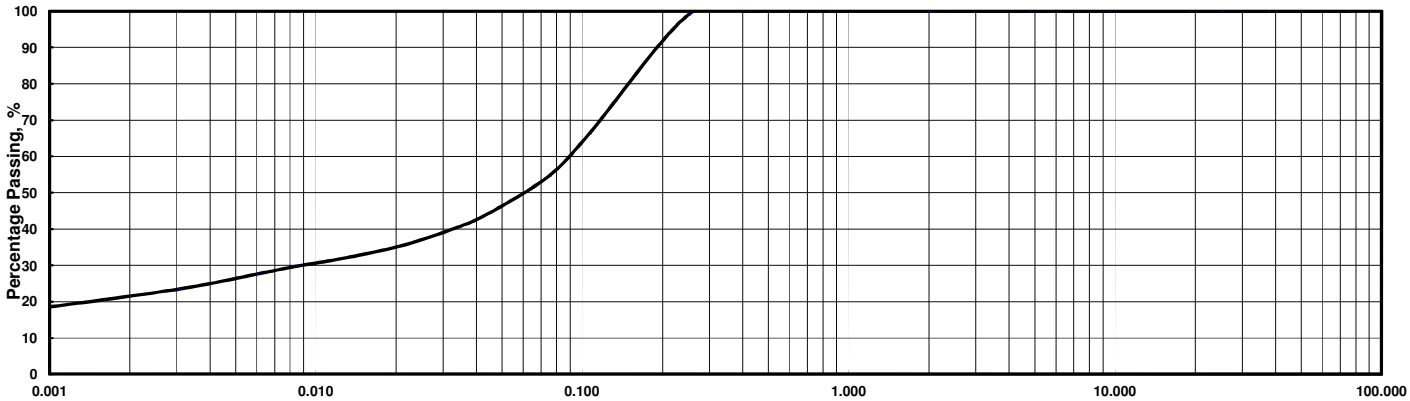
Sample No. : **OF-05-3 D-2** Depth : **5.00-5.80m** (_____) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.0	66.2	54.7
Hydro.	Dia., mm	0.044	0.032	0.020	0.012	0.0084	0.0060	0.0030	0.0009							
	% Passing	44.2	39.7	35.2	31.6	29.8	27.6	23.4	18.0							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-05-3 D-2 5.00-5.80m		Sample No. Depth	OF-05-3 D-2 5.00-5.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.088 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.0088 mm	
0.425 - 0.075 mm	45.3 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	28.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	26.2 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	54.7 %				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **29.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

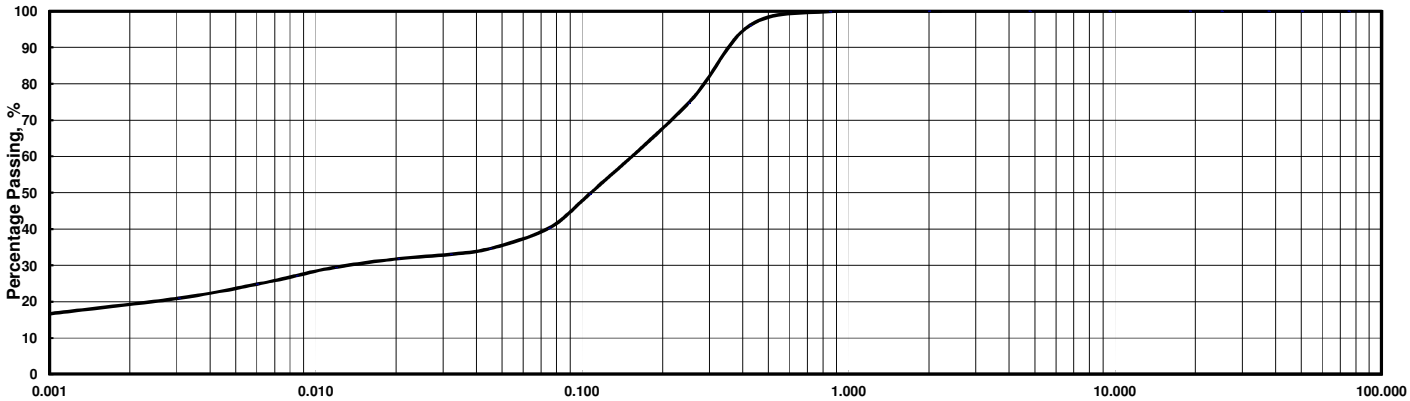
Sample No. : **OF-05-3 D-3** Depth : **8.00-8.90m** ( ) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	96.0	74.7	49.6	40.3
Hydro.	Dia., mm	0.045	0.032	0.020	0.012	0.0084	0.0060	0.0030	0.0009							
	% Passing	34.6	33.1	31.8	29.5	27.2	24.8	21.0	16.3							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-3 D-3 8.00-8.90m		Sample No. Depth	OF-05-3 D-3 8.00-8.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.15 mm	
2.00 - 0.425 mm	4.0 %		Dia. at 30%	0.013 mm	
0.425 - 0.075 mm	55.8 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	16.8 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	23.5 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.9 %				
75um Sieve Passing	40.3 %				

Kiso-Jiban Consultants Co., Ltd.

132

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **01.12.14** Tested By : **Motiur** Checked by : **A. B. Tan**

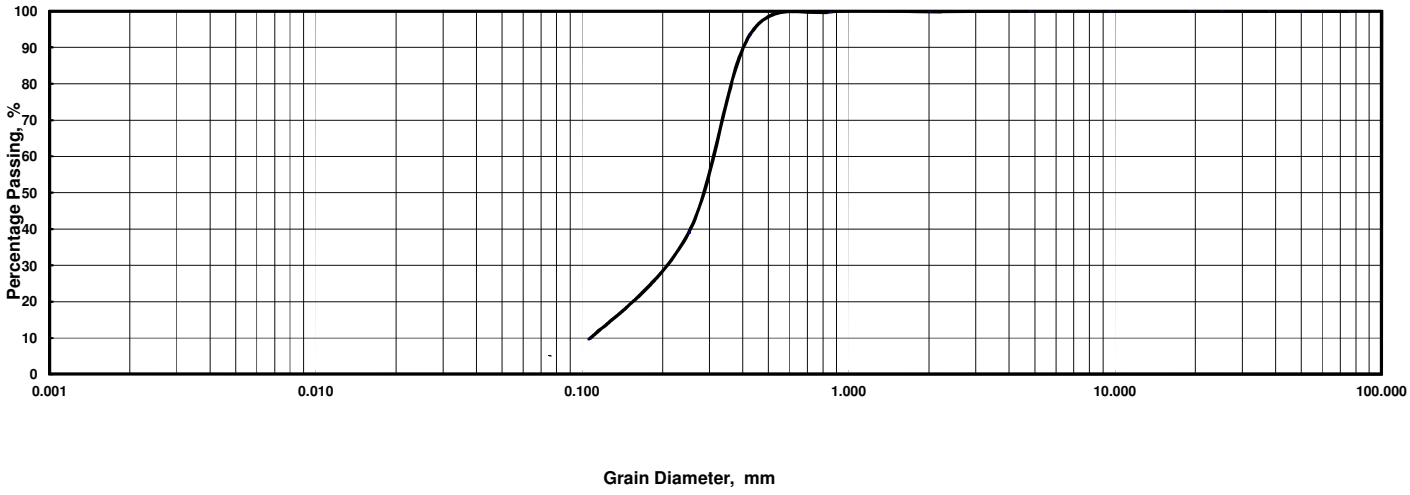
Sample No. : **OF-05-3 D-4** Depth : **11.00-11.60m** (_____) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.7	93.5	38.9	9.8	5.2
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-3 D-4 11.00-11.60m			Sample No. Depth	OF-05-3 D-4 11.00-11.60m	
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm
4.75 - 2.00 mm	0.2	%		Dia. at 60%	0.31	mm
2.00 - 0.425 mm	6.4	%		Dia. at 30%	0.19	mm
0.425 - 0.075 mm	88.3	%		Dia. at 10%	0.11	mm
0.075 - 0.005 mm	5.2	%		Coeff. of Uniformity	2.87	
Smaller than 0.005 mm				Coeff. of Curvature	1.13	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.7	%				
75um Sieve Passing	5.2	%				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **01.12.14** Tested By : **Motiur** Checked by : **A. B. Tan**

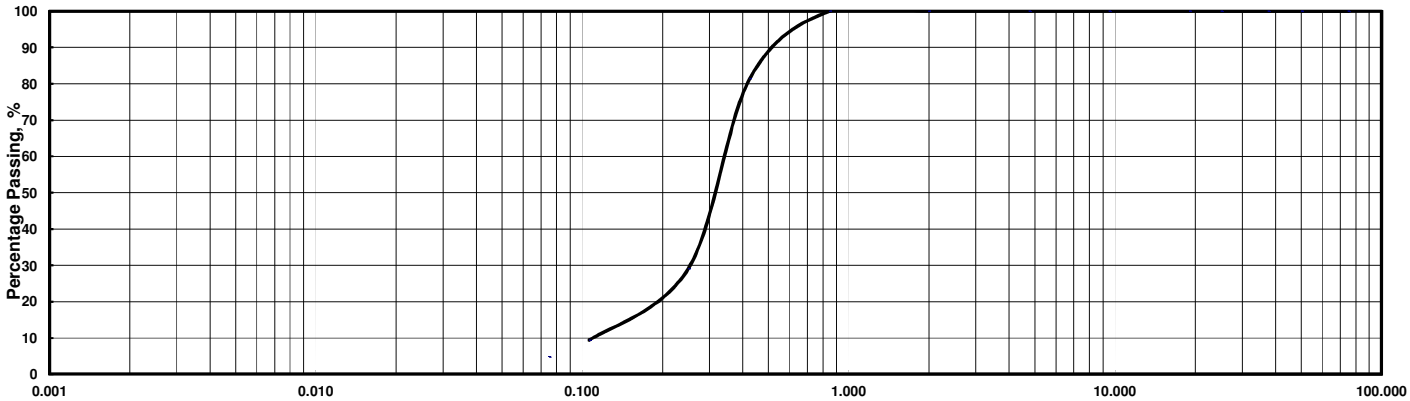
Sample No. : **OF-05-3 D-5** Depth : **14.00-14.60m** (_____) Specific Gravity :

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	81.4	29.2	9.4	4.8
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-3 D-5 14.00-14.60m			Sample No. Depth	OF-05-3 D-5 14.00-14.60m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.34	mm
2.00 - 0.425 mm	18.6	%		Dia. at 30%	0.25	mm
0.425 - 0.075 mm	76.6	%		Dia. at 10%	0.11	mm
0.075 - 0.005 mm	4.8	%		Coeff. of Uniformity	3.15	
Smaller than 0.005 mm				Coeff. of Curvature	1.71	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	4.8	%				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **29.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

Sample No. : **OF-05-3 D-6** Depth : **17.00-17.60m** (_____) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	97.8	92.1	77.9	61.3	56.4
Hydro.	Dia., mm	0.043	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0009							
	% Passing	49.7	46.2	40.8	33.7	31.1	28.1	24.5	20.4							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-3 D-6 17.00-17.60m		Sample No. Depth	OF-05-3 D-6 17.00-17.60m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.750 mm	
4.75 - 2.00 mm	0.8 %		Dia. at 60%	0.097 mm	
2.00 - 0.425 mm	7.2 %		Dia. at 30%	0.0075 mm	
0.425 - 0.075 mm	35.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	29.6 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	26.9 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	97.8 %				
75um Sieve Passing	56.4 %				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **29.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

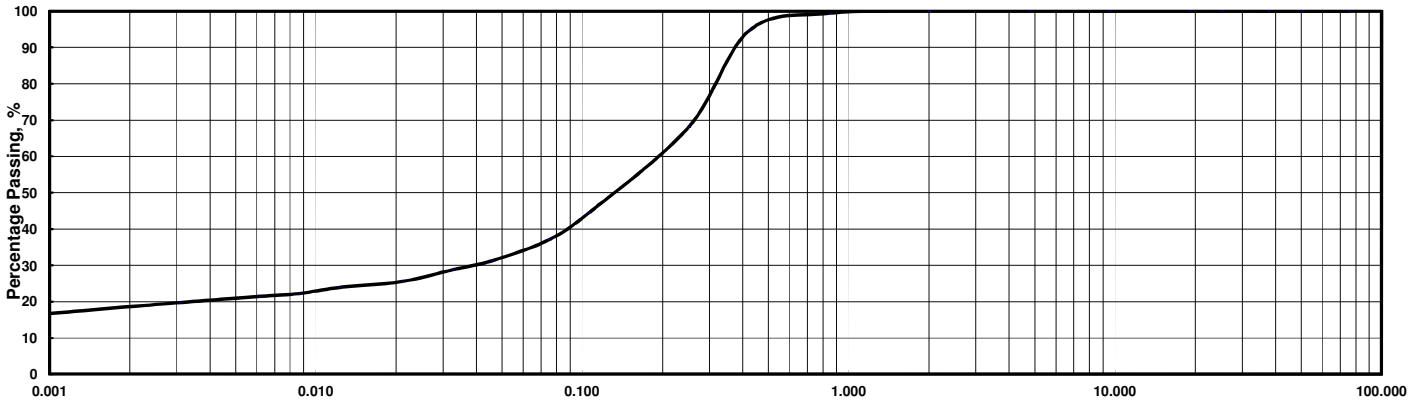
Sample No. : **OF-05-3 D-7** Depth : **20.00-20.70m** ( ) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	94.8	68.0	44.5	37.1
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0087	0.0061	0.0031	0.0009							
	% Passing	31.3	28.8	25.5	23.9	22.2	21.4	19.8	16.5							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-3 D-7 20.00-20.70m		Sample No. Depth	OF-05-3 D-7 20.00-20.70m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.19 mm	
2.00 - 0.425 mm	5.2 %		Dia. at 30%	0.039 mm	
0.425 - 0.075 mm	57.7 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	16.3 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	20.8 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.4 %				
75um Sieve Passing	37.1 %				

Kiso-Jiban Consultants Co., Ltd.

14) OF-05-3a

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **01.12.14** Tested By : **Motiur** Checked by : **A. B. Tan**

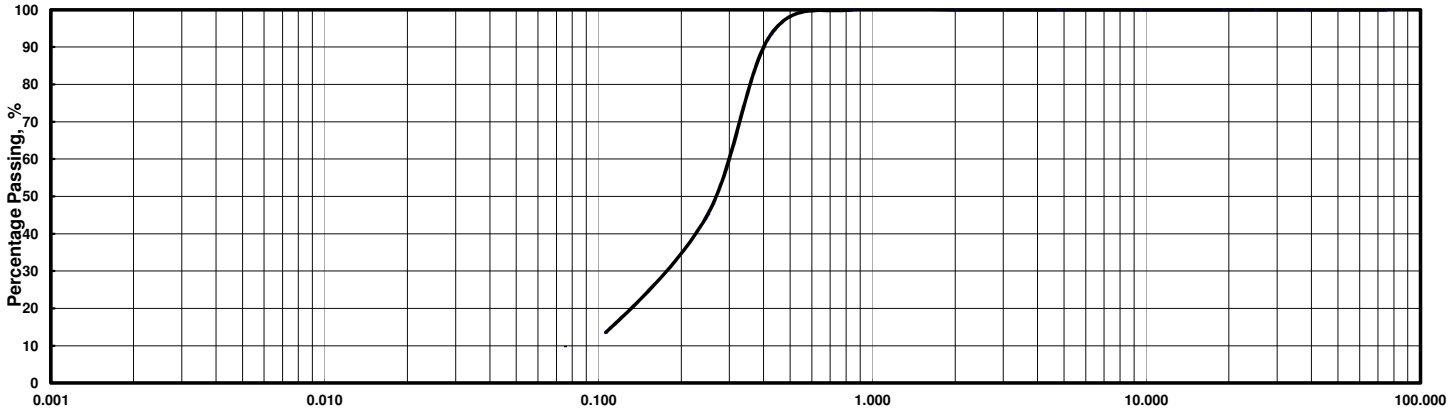
Sample No. : **OF-05-3a D-1** Depth : **10.00-10.70m** ( ) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	93.4	45.2	13.6	9.8
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-05-3a D-1 10.00-10.70m			Sample No. Depth	OF-05-3a D-1 10.00-10.70m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.29	mm
2.00 - 0.425 mm	6.6	%		Dia. at 30%	0.17	mm
0.425 - 0.075 mm	83.6	%		Dia. at 10%	0.12	mm
0.075 - 0.005 mm	9.8	%		Coeff. of Uniformity	2.64	
Smaller than 0.005 mm				Coeff. of Curvature	1.09	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	9.8	%				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **01.12.14** Tested By : **Motiur** Checked by : **A. B. Tan**

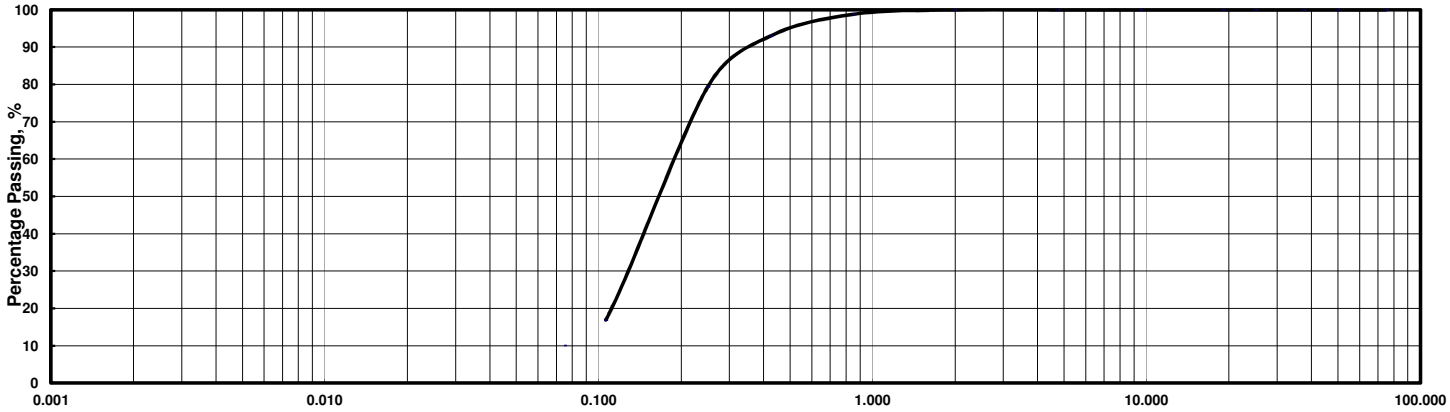
Sample No. : **OF-05-3a D-2** Depth : **13.00-13.80m** ( ) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.8	93.0	79.4	16.9	10.1
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-3a D-2 13.00-13.80m		Sample No. Depth	OF-05-3a D-2 13.00-13.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.19 mm	
2.00 - 0.425 mm	7.0 %		Dia. at 30%	0.13 mm	
0.425 - 0.075 mm	82.9 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	10.1 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm			Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	98.8 %				
75um Sieve Passing	10.1 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **01.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

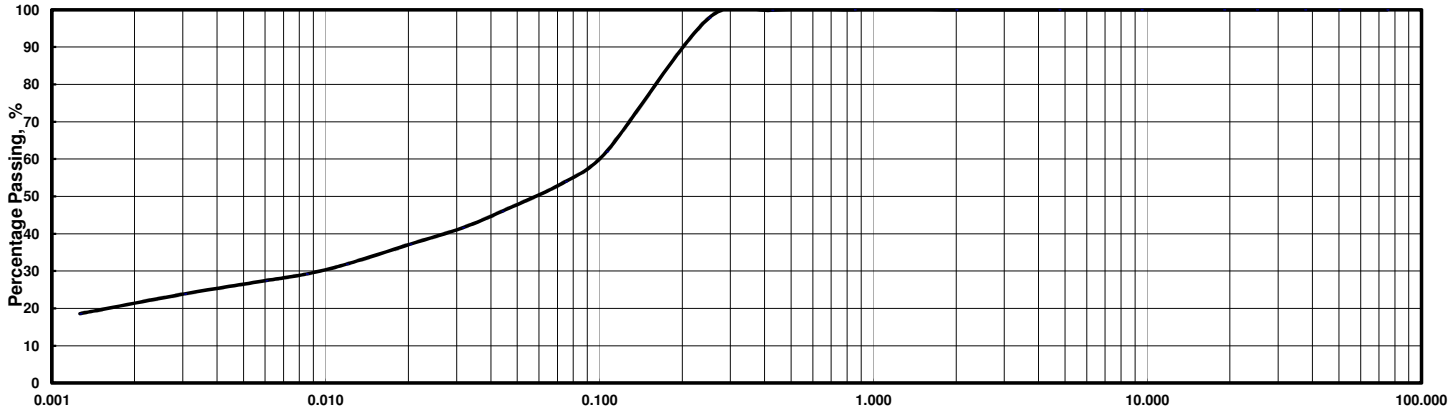
Sample No. : **OF-05-3a D-3** Depth : **18.50-19.40m** ( ) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	97.7	62.0	54.0
Hydro.	Dia., mm	0.044	0.032	0.020	0.012	0.0085	0.0060	0.0030	0.0013							
	% Passing	46.0	41.6	37.2	31.9	29.2	27.4	23.9	18.6							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-3a D-3 18.50-19.40m		Sample No. Depth	OF-05-3a D-3 18.50-19.40m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.097 mm	
2.00 - 0.425 mm	0.2 %		Dia. at 30%	0.0094 mm	
0.425 - 0.075 mm	45.9 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	27.7 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	26.2 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	54.0 %				

Summary of Consolidated Drained Triaxial Compression Test

Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 06.12.14		Tested by : Perera		Checked by : A. B. Tan			
Borehole No.: OF-05-3a		Sample No.:D-1		Depth : 10.00-10.70m			
Specimen Condition : Remoulded		Test Method : ASTM D7181-11					
Soil Description : Sand with Clay		Ave. Diameter : 50.0mm		Ave. Height : 100.0mm			
Specimen No.			1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.54	1.54	1.54		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	570	600		
	B-value		0.96	0.97	0.96		
Consolidation Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	529	558	586		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.07	0.10	0.14		
	Coefficient of Consolidation Cv,	m^2/year	525	492	263		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.018	0.014	0.014		
Compression Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	144	214	323		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-0.96	-0.79	-0.73		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	5.18	8.36	5.47		
Shear Strength Parameters	ϕ_d = 38 Degree c_d = 0 kPa		Mode of Failure				
			1	2	3	4	

Remarks :

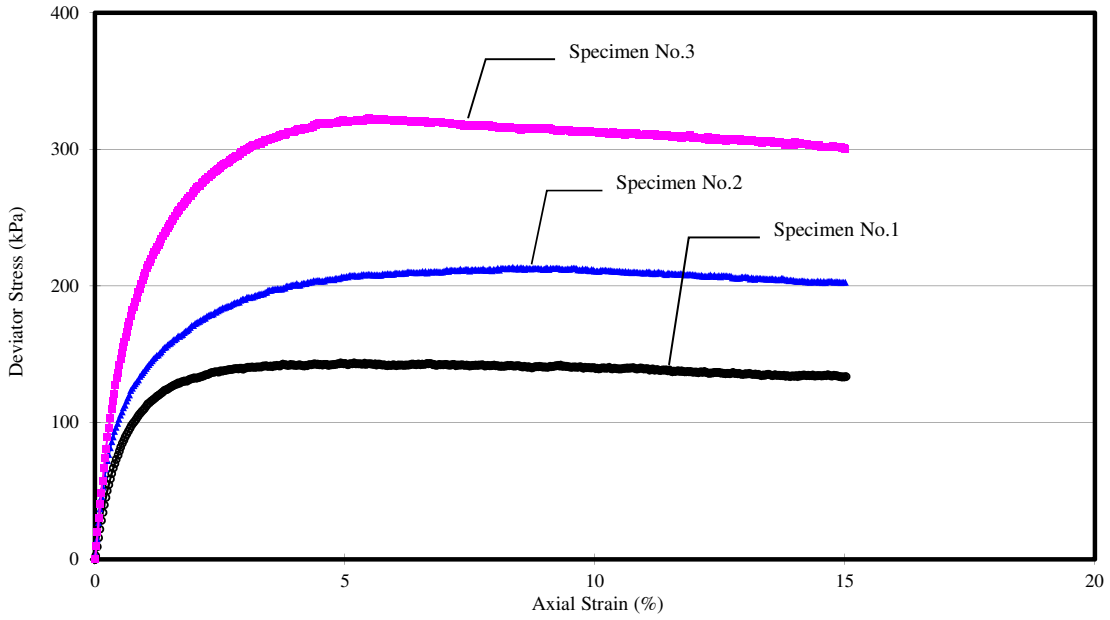
Specimens are prepared at 90% of Maximum dry density (from compaction Test)= 1.54 Mg/m^3

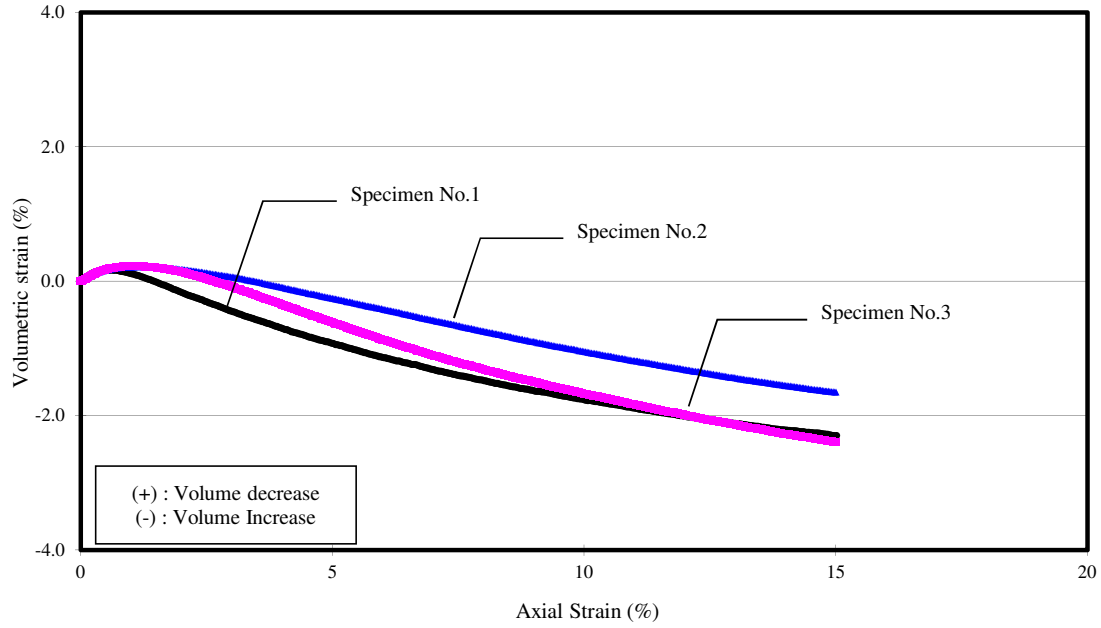
Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No.: S27-14 Sample No.: D-1 Soil Type: Sand with Clay

Borehole No.: OF-05-3a Depth : 10.00-10.70m





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

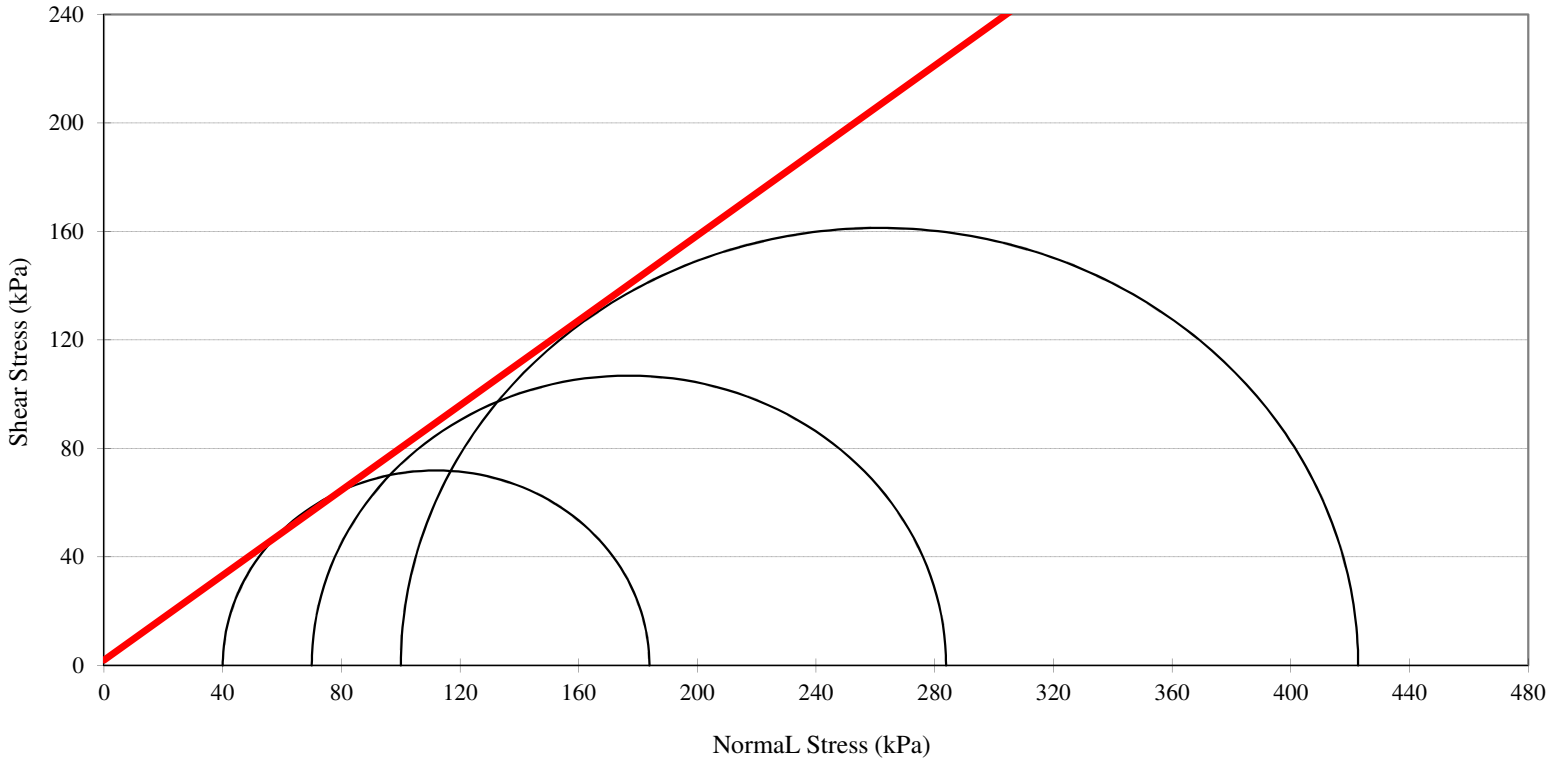
Project No. : S27-14

Borehole No. : OF-05-3a Soil Type: Sand with Clay

Sample No. : D-1 Depth : 10.00-10.70m

Angle of Internal Friction, ϕ_d 38 deg

Cohesion, c_d 0 kPa



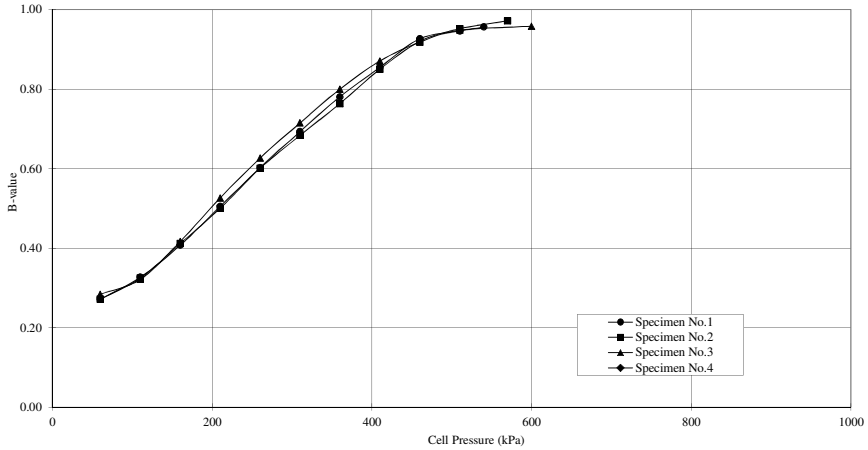
Kiso-Jiban Consultants Co., Ltd.

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: OF-05-3a
Sample No.: D-1

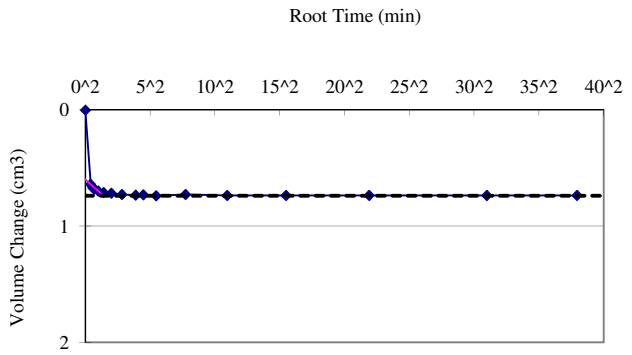
Depth : 10.00-10.70m
Soil Type: Sand with Clay

		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	28.2	20	28.1	20	28.5		
	Back Pressure (kPa)	20		20		20			
	B-value	0.27		0.27		0.28			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	66.3	50	66.2	50	66.1		
	Back Pressure (kPa)	50		50		50			
	B-value	0.33		0.32		0.32			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	120.4	100	120.6	100	120.8		
	Back Pressure (kPa)	100		100		100			
	B-value	0.41		0.41		0.42			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	175.2	150	175.0	150	176.3		
	Back Pressure (kPa)	150		150		150			
	B-value	0.50		0.50		0.53			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	230.1	200	230.0	200	231.3		
	Back Pressure (kPa)	200		200		200			
	B-value	0.60		0.60		0.63			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	284.7	250	284.2	250	285.8		
	Back Pressure (kPa)	250		250		250			
	B-value	0.69		0.68		0.72			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	339.0	300	338.2	300	340.0		
	Back Pressure (kPa)	300		300		300			
	B-value	0.78		0.76		0.80			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	392.7	350	392.5	350	393.5		
	Back Pressure (kPa)	350		350		350			
	B-value	0.85		0.85		0.87			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	446.3	400	446.0	400	445.9		
	Back Pressure (kPa)	400		400		400			
	B-value	0.93		0.92		0.92			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	497.3	450	497.6	450	497.4		
	Back Pressure (kPa)	450		450		450			
	B-value	0.95		0.95		0.95			
B-check Step.11	Cell Pressure (kPa)	510	540	510	570	510	600		
	P.W.P (kPa)	500	528.7	500	558.3	500	586.2		
	Back Pressure (kPa)	500		500		500			
	B-value	0.96		0.97		0.96			



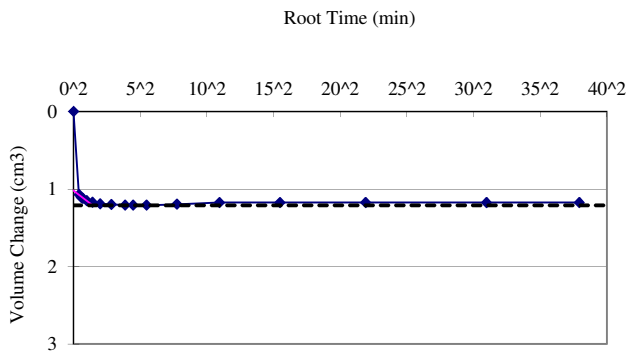
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: OF-05-3a Soil Type: Sand with Clay
Sample No.: D-1 Depth : 10.00-10.70m



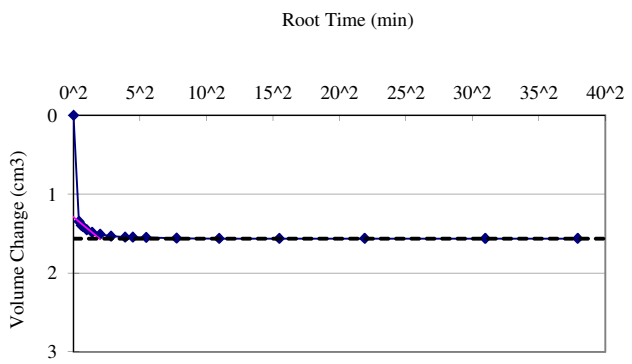
Specimen No.: 1

p' =	40	kPa
t100 =	2.0	min
Cv =	525	m^2/year
mvi=	0.018	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	2.1	min
Cv =	492	m^2/year
mvi=	0.014	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	3.9	min
Cv =	263	m^2/year
mvi=	0.014	m^2/MN

RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

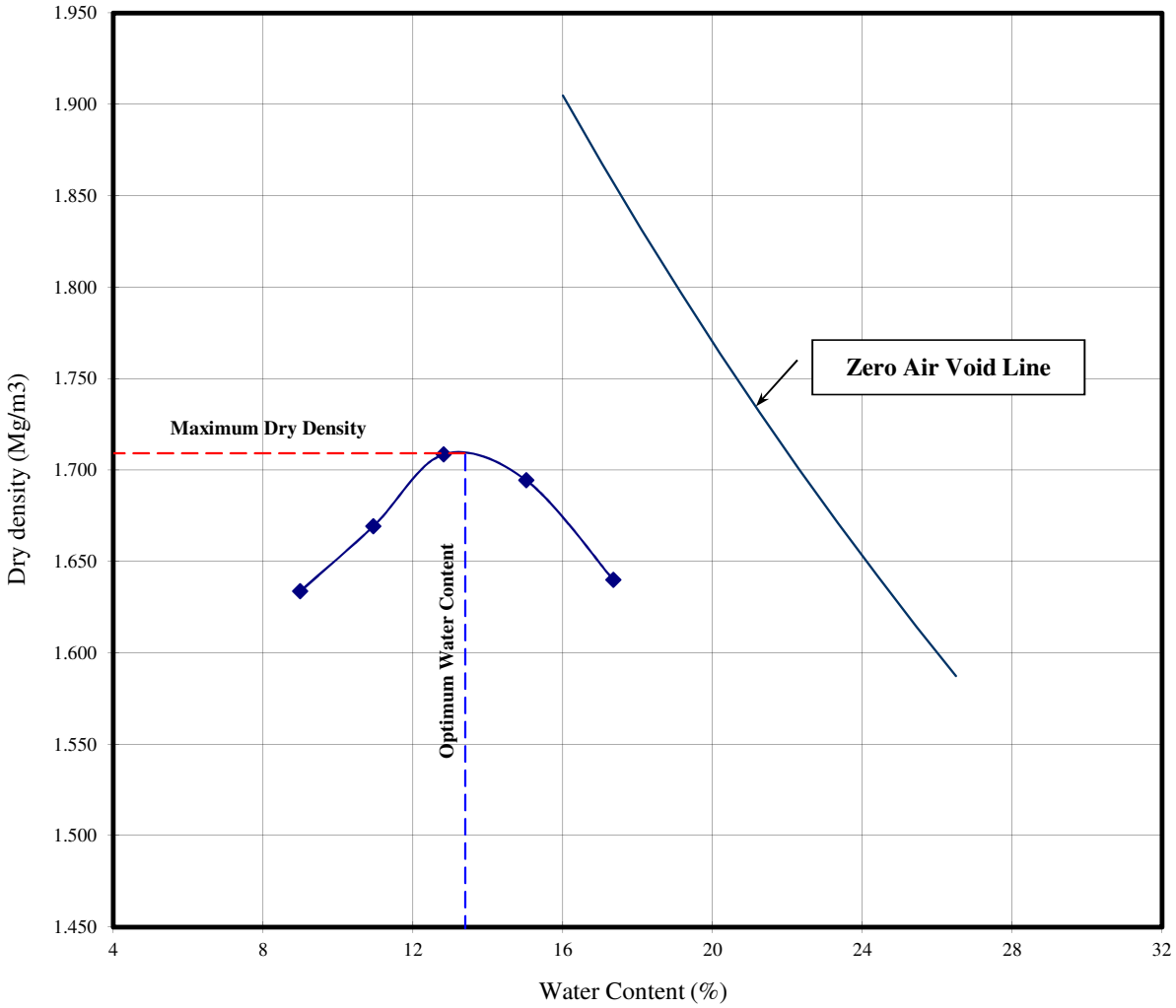
Sampling Date : - **Date of Testing :** 1-Dec-14 **Tested by :** Perera/Bala

Sample No. : OF-05-3a D-1 (10.00-10.70m) **Ref. No.** -

Soil Type :	Silty Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.74	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	9.0	10.9	12.8	15.0	17.3			
Wet Density (Mg/m3)	1.781	1.852	1.928	1.949	1.924			
Dry Density (Mg/m3)	1.634	1.669	1.709	1.694	1.640			

Maximum Dry Density	**1.709 Mg/m3**
Optimum Water Content	**13.4 %**



146

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.		**OF-05-3a**								
Sample No.		D-1	D-2	D-3						
Sample Depth		10.00m ~10.70m	13.00m ~13.80m	18.50m ~19.40m						
Condition of Sample		Disturbed								
Natural Water Content	%	22.7	21.9	25.2						
Specific Gravity		2.68	2.68	2.70						
Wet Density	Mg/m^3	1.94	1.85	-						
Dry Density	Mg/m^3	1.58	1.52	-						
Natural Void Ratio		0.69	0.76	-						
Degree of Saturation	%	88	77	-						
Atterberg Limits	Liquid Limit, %	- *3	- *3	- *3						
	Plastic Limit, %	- *3	- *3	- *3						
	Plasticity Index, %	- *3	- *3	- *3						
Grain Size Analysis	Gravel, %	0	0	0						
	Sand, %	90	90	46						
	Silt, %	10	10	28						
	Clay & Colloid, %			26						
	Max. diameter, mm	0.850	2.00	0.850						
	Diam. at 60% mm	0.29	0.19	0.097						
	Diam. at 10% mm	0.12	-	-						
Visual soil description		Sand with Clay	Sand with Clay	Sandy Clay						
Unified soil classification		-	-	-						
Triaxial compression test	Angle of Internal Friction (^{0})	-	-	-						
	Cohesion Intercept, kPa	-	-	-						
	Condition of drainage	-	-	-						
	Angle of Internal Friction *2 (^{0})	38	-	-						
	Cohesion Intercept, kPa *2	0	-	-						
	Condition of drainage	CD*5	-	-						
Consolidation Test	Preconsolidation Pressure, kPa	-	-	-						
	Compression Index(Average)	-	-	-						
	Pressure Range for Compression Index(kPa)	-	-	-						
	Swell index	-	-	-						
Compaction Test *4	Maximum Dry Density, Mg/m^3	1.71	-	-						
	Optimum Moisture Content , %	13.4	-	-						
Unconfined Compression Strength (kPa)		-	-	-						
Strain at failure (%)		-	-	-						

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

*4 : By using 2.5 kg Rammer *5 : Specimens are prepared at 90% of Maximum dry density Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

15) OF-05-3b

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.		**OF-05-3b**								
Sample No.		D-1	D-2	D-3						
Sample Depth		3.00m ~3.90m	6.00m ~6.90m	10.20m ~10.93m						
Condition of Sample		Disturbed								
Natural Water Content	%	26.4	31.8	17.9						
Specific Gravity		2.70	2.74	2.70						
Wet Density	Mg/m^3	1.95	1.86	-						
Dry Density	Mg/m^3	1.54	1.41	-						
Natural Void Ratio		0.75	0.95	-						
Degree of Saturation	%	95	92	-						
Atterberg Limits	Liquid Limit, %	- *3	32	- *3						
	Plastic Limit, %	- *3	18	- *3						
	Plasticity Index, %	- *3	14	- *3						
Grain Size Analysis	Gravel, %	0	0	0						
	Sand, %	76	34	93						
	Silt, %	8	31	7						
	Clay & Colloid, %	16	35							
	Max. diameter, mm	0.850	0.850	2.00						
	Diam. at 60% mm	0.15	0.053	0.29						
	Diam. at 10% mm	-	-	0.10						
Visual soil description		Clayey Sand	Sandy Clay	Sand with Clay						
Unified soil classification		-	CL	-						
Triaxial compression test	Angle of Internal Friction (^{0})	-	-	-						
	Cohesion Intercept, kPa	-	-	-						
	Condition of drainage	-	-	-						
	Angle of Internal Friction *2 (^{0})	-	-	37						
	Cohesion Intercept, kPa *2	-	-	0						
	Condition of drainage	-	-	CD*5						
Consolidation Test	Preconsolidation Pressure, kPa	-	-	-						
	Compression Index(Average)	-	-	-						
	Pressure Range for Compression Index(kPa)	-	-	-						
	Swell index	-	-	-						
Compaction Test *4	Maximum Dry Density, Mg/m^3	-	-	1.67						
	Optimum Moisture Content , %	-	-	16.5						
Unconfined Compression Strength (kPa)		-	-	-						
Strain at failure (%)		-	-	-						

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

*4 : By using 2.5 kg Rammer *5 : Specimens are prepared at 90% at Maximum dry density Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

150

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No. : S27-14

Standard : ASTM D4318-10

Date of Testing : 01.12.14

Tested By : Vasantha

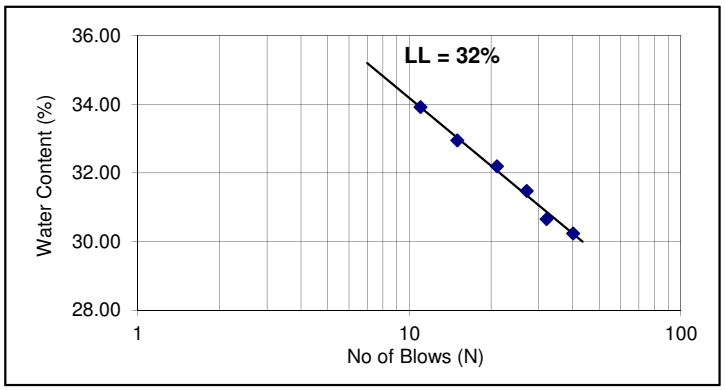
Checked By : A. B. Tan

Sample No. : OF-05-3b D2

Depth : 6.00-6.90m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	40	30.23
2	32	30.65
3	27	31.47
4	21	32.18
5	15	32.94
6	11	33.92
Liquid Limits %		**32**
Plastic Limits %		**18**
Plasticity Index		**14**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

151

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **01.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

Sample No. : **OF-05-3b D-1** Depth : **3.00-3.90m** ( ) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.1	32.1	23.9
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	20.3	19.7	19.1	18.5	17.3	16.7	14.9	11.9							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves

Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	FINE	MEDIUM	COARSE	FINE	COARSE	
	SILT	SAND		GRAVEL		

Sample No. Depth	OF-05-3b D-1 3.00-3.90m			Sample No. Depth	OF-05-3b D-1 3.00-3.90m		
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.15	mm	
2.00 - 0.425 mm	0.1	%		Dia. at 30%	0.097	mm	
0.425 - 0.075 mm	76.0	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	7.9	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	16.0	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	100.0	%					
75um Sieve Passing	23.9	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **01.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

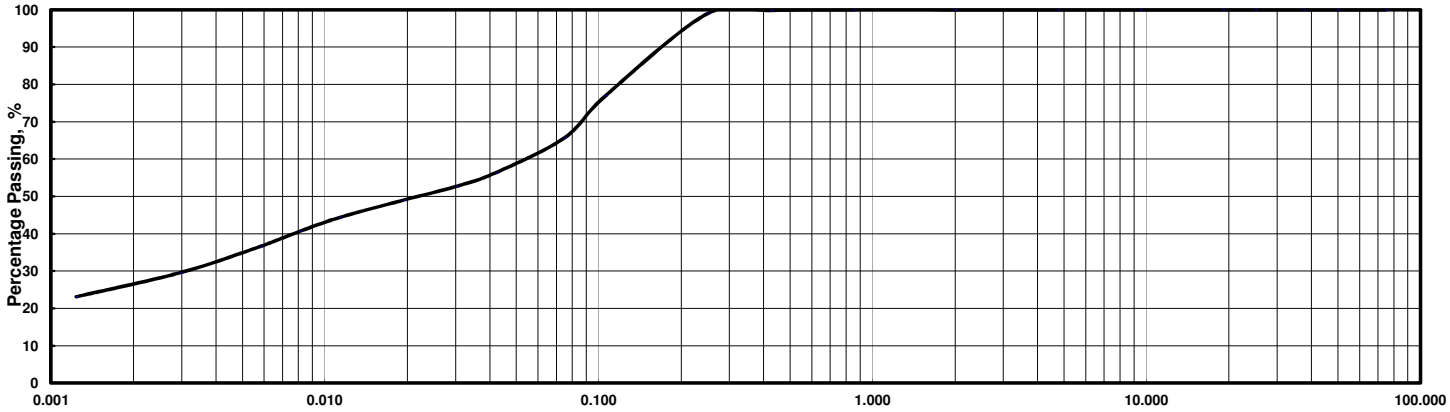
Sample No. : **OF-05-3b D-2** Depth : **6.00-6.90m** ( ) Specific Gravity : 2.74

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.0	77.0	65.7
Hydro.	Dia., mm	0.042	0.030	0.019	0.011	0.0081	0.0058	0.0030	0.0012							
	% Passing	56.4	52.7	49.0	44.4	40.7	36.6	29.6	23.1							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	OF-05-3b D-2 6.00-6.90m		Sample No. Depth	OF-05-3b D-2 6.00-6.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.053 mm	
2.00 - 0.425 mm	0.2 %		Dia. at 30%	0.0031 mm	
0.425 - 0.075 mm	34.1 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	31.1 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	34.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	65.7 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **01.12.14** Tested By : **Motiur** Checked by : **A. B. Tan**

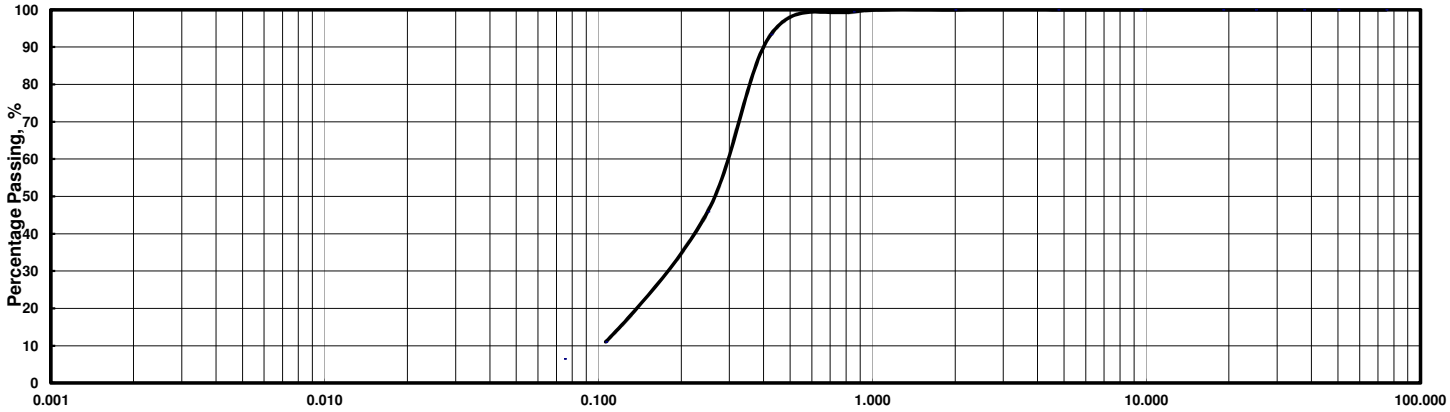
Sample No. : **OF-05-3b D-3** Depth : **10.20-10.93m** ( ) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	93.4	45.9	11.0	6.5
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	OF-05-3b D-3 10.20-10.93m			Sample No. Depth	OF-05-3b D-3 10.20-10.93m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.29	mm
2.00 - 0.425 mm	6.6	%		Dia. at 30%	0.17	mm
0.425 - 0.075 mm	86.9	%		Dia. at 10%	0.10	mm
0.075 - 0.005 mm	6.5	%		Coeff. of Uniformity	2.98	
Smaller than 0.005 mm				Coeff. of Curvature	1.00	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.4	%				
75um Sieve Passing	6.5	%				

Summary of Consolidated Drained Triaxial Compression Test

Project No.: S27-14	Project :Preparatory Survey on Matarbari USC Coral-fired Power Project		
Date Tested : 13.12.14	Tested by : Perera	Checked by : A. B. Tan	
Borehole No.: OF-05-3b	Sample No.:D-3	Depth :10.20-10.93m	
Specimen Condition : Remoulded	Test Method : ASTM D7181-11		
Soil Description : Sand with Clay	Ave. Diameter : 50.0mm	Ave. Height : 100.0mm	

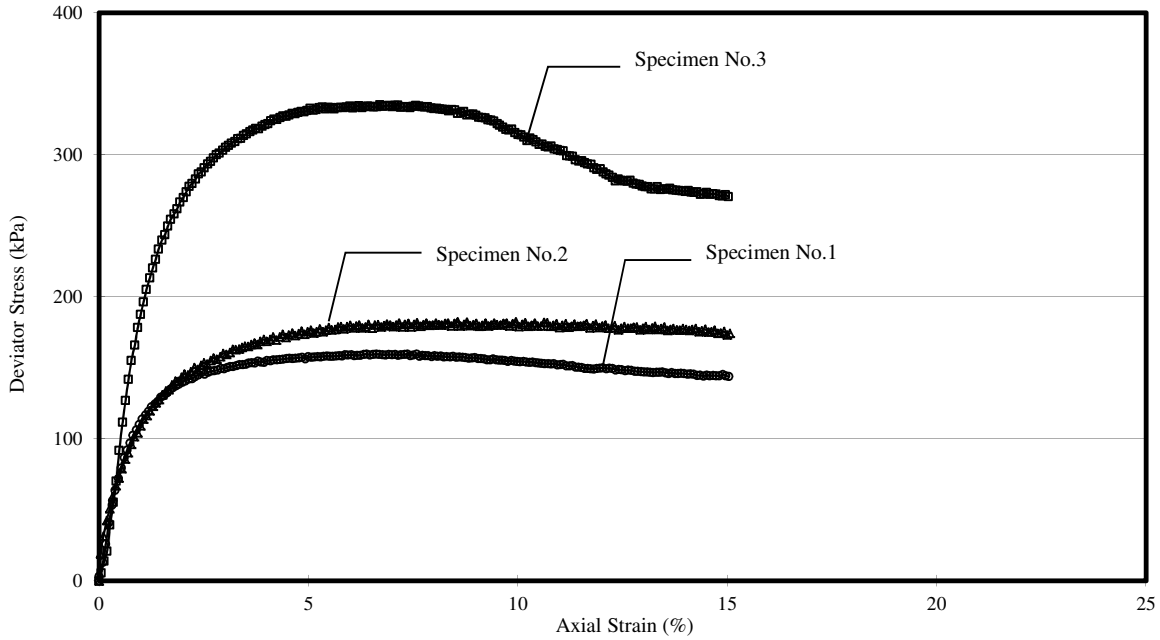
	Specimen No.		1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.51	1.51	1.51		
Saturation Stage	Saturated PWP,	kPa	200	200	200		
	Final Cell Pressure,	kPa	240	270	300		
	B-value		0.97	0.97	0.96		
Consolidation Stage	Cell Pressure	kPa	240	270	300		
	Back Pressure	kPa	200	200	200		
	Initial PWP,	kPa	228	252	282		
	Final PWP	kPa	200	200	200		
Consolidation Parameter	Volume Change,	%	0.04	0.04	0.14		
	Coefficient of Consolidation Cv,	m^2/year	22.94	48.76	11.10		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.01	0.01	0.01		
Compression Stage	Cell Pressure	kPa	240	270	300		
	Back Pressure	kPa	200	200	200		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	160	182	335		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-2.13	-2.28	-1.65		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	6.39	8.56	6.70		
Shear Strength Parameters	In terms of Effective Stress $\phi' = 37$ deg $c' = 0$ kPa		Mode of Failure				
			1	2	3	4	

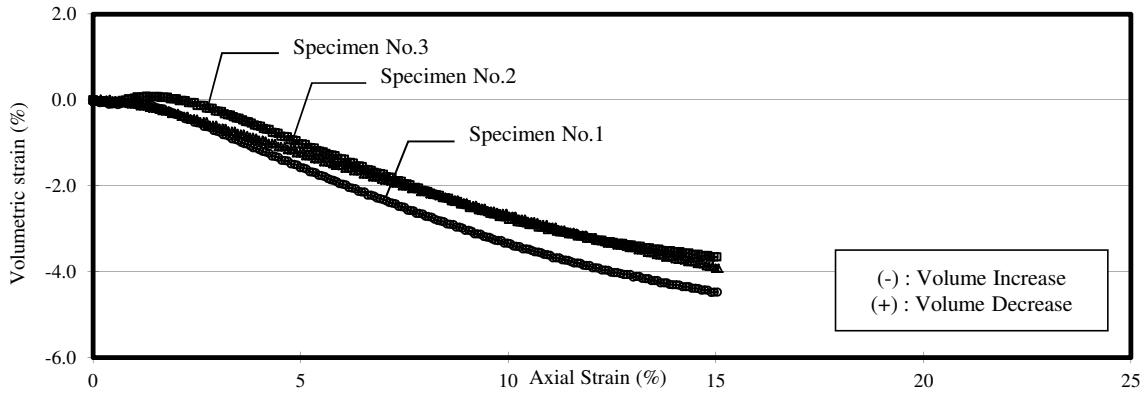
Remarks :

Specimens are prepared at 90% of Maximum dry density (from compaction Test) = 1.51 Mg/m^3

Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-3 Soil Type: Sand with Clay
Borehole No.: OF-05-3b Depth : 10.20-10.93m



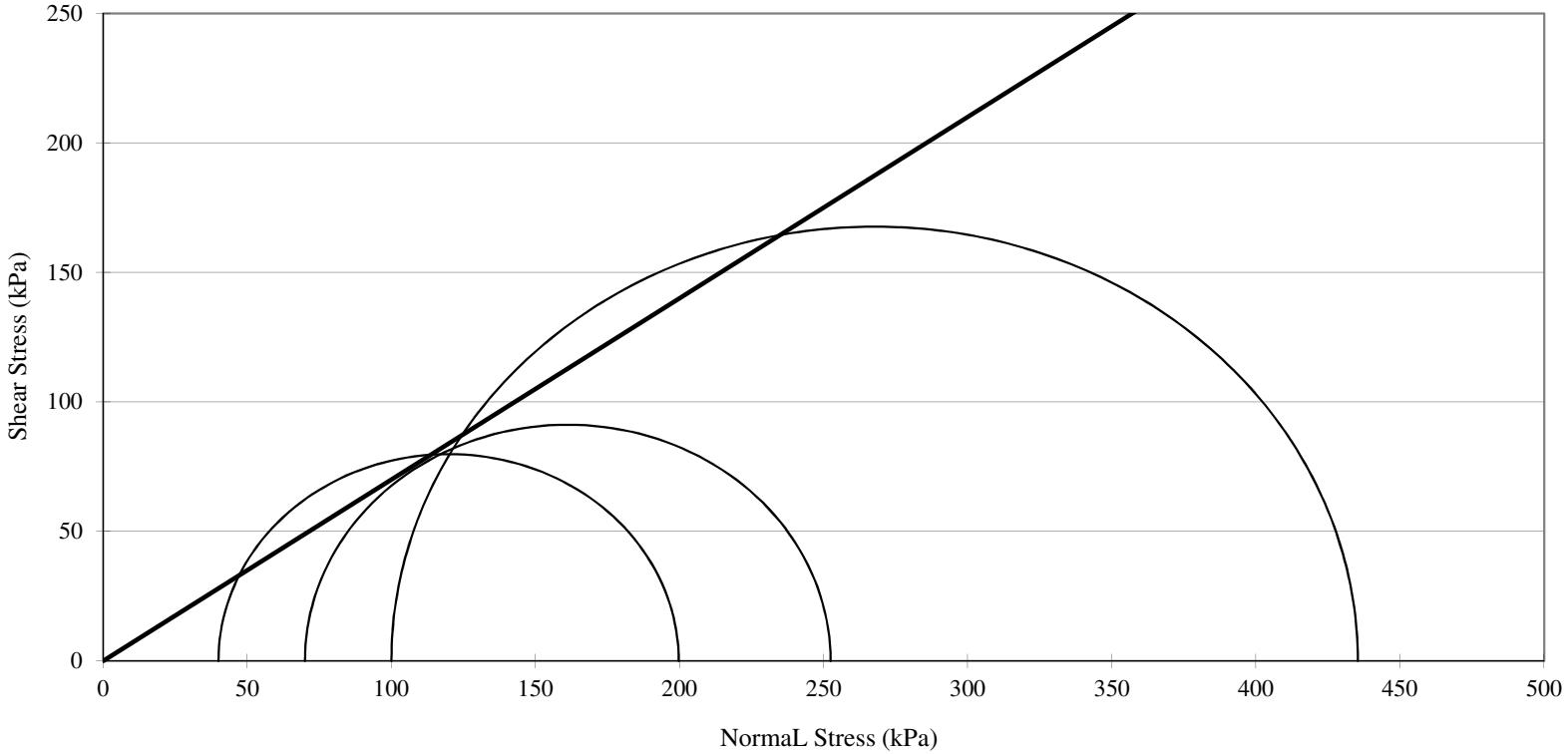


Consolidated Drained Triaxial Compression Test

- Mohr' s Circle (In terms of Total Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14

Borehole No. : OF-05-3b Soil Type: Sand with Clay
Sample No. : D-3 Depth : 10.20-10.93m
Angle of Internal Friction, ϕ 35 deg
Cohesion, c 0 kPa

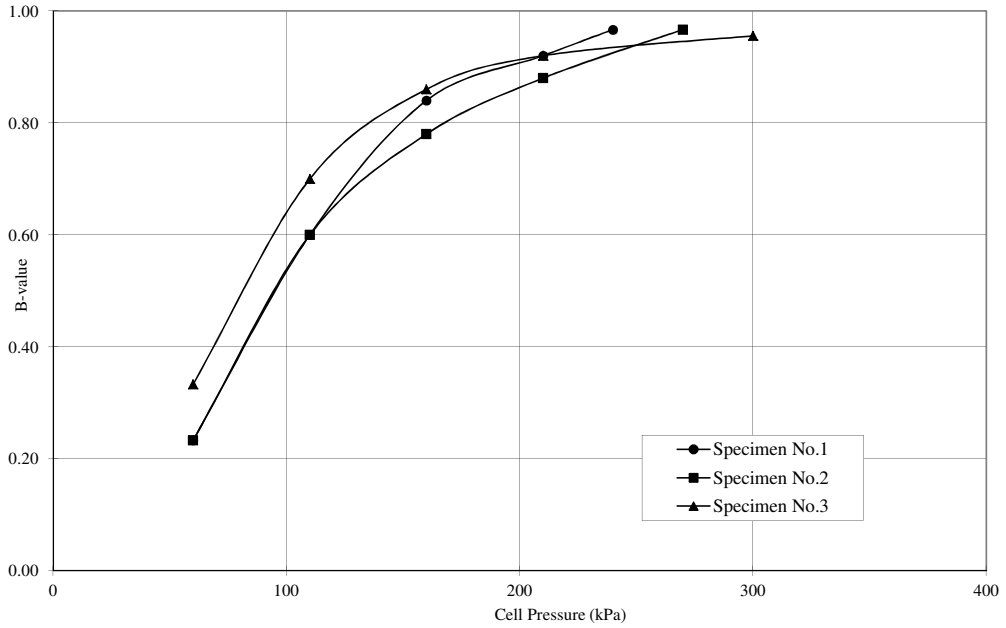


Kiso-Jiban Consultants Co., Ltd.

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

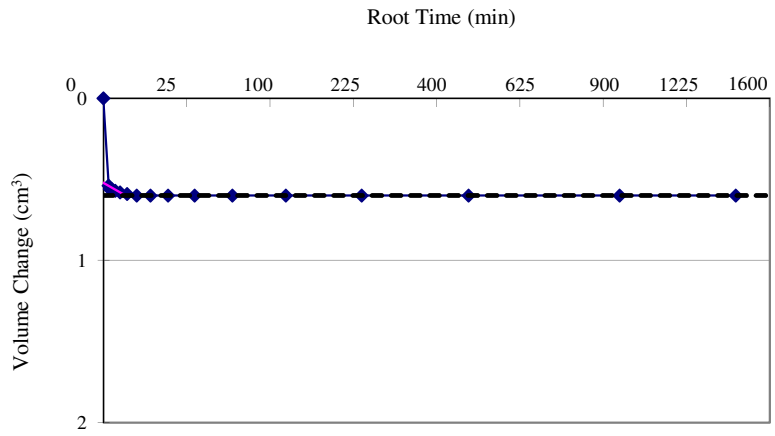
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: OF-05-3b
Depth : 10.20-10.93m
Sample No.: D-3
Soil Type: Sand with Clay

		Result of B-value Check					
		Specimen 1		Specimen 2		Specimen 3	
		Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60
	P.W.P (kPa)	20	27	20	27	20	30
	Back Pressure (kPa)	20		20		20	
	B-value	0.23		0.23		0.33	
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110
	P.W.P (kPa)	50	80	50	80	50	85
	Back Pressure (kPa)	50		50		50	
	B-value	0.60		0.60		0.70	
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160
	P.W.P (kPa)	100	142	100	139	100	143
	Back Pressure (kPa)	100		100		100	
	B-value	0.84		0.78		0.86	
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210
	P.W.P (kPa)	150	196	150	194	150	196
	Back Pressure (kPa)	150		150		150	
	B-value	0.92		0.88		0.92	
B-check Step.5	Cell Pressure (kPa)	210	240	210	270	210	300
	P.W.P (kPa)	200	229	200	258	200	286
	Back Pressure (kPa)	200		200		200	
	B-value	0.97		0.97		0.96	



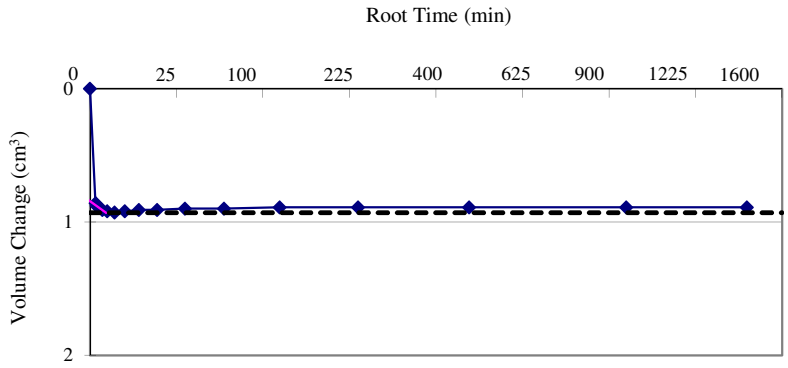
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-3 Soil Type: Sand with Clay
Borehole No.: OF-05-3b Depth : 10.20-10.93m



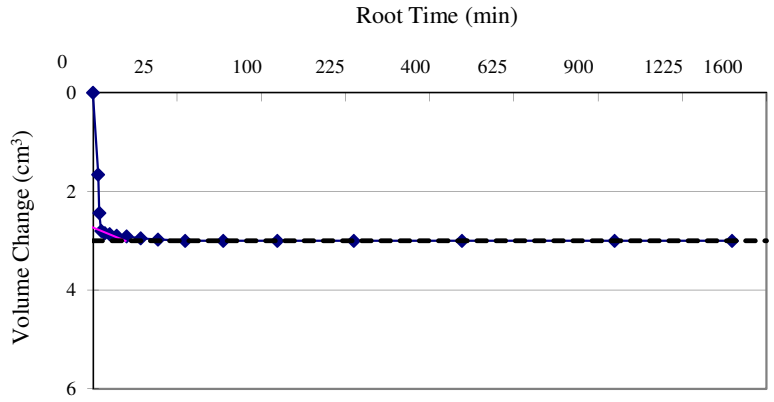
Specimen No.: 1

p' =	40	kPa
t100 =	1.8	min
Cv =	22.94	m^2/year
mvi=	0.01	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	0.8	min
Cv =	48.76	m^2/year
mvi=	0.01	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	3.7	min
Cv =	11.10	m^2/year
mvi=	0.01	m^2/MN

RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

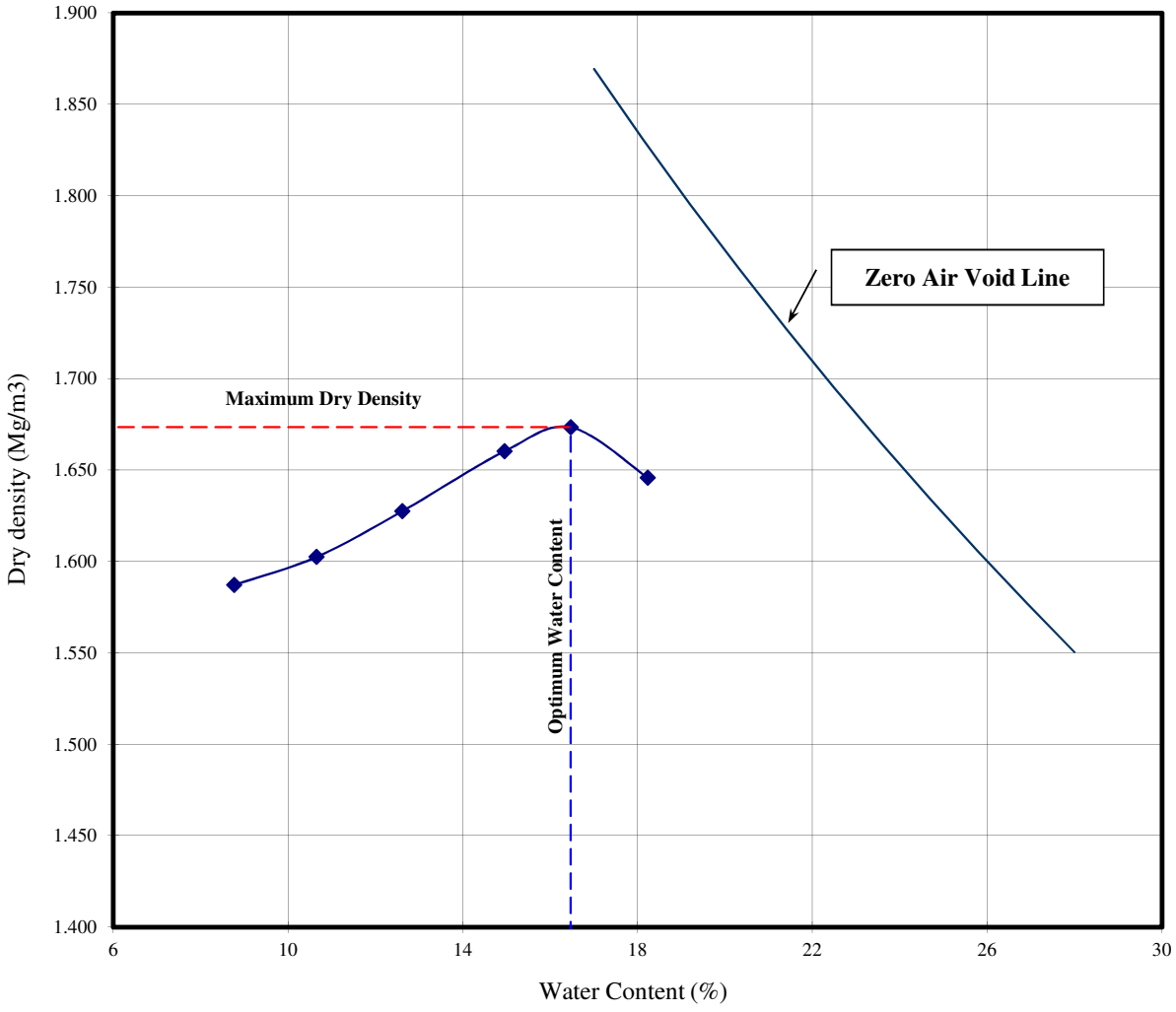
Sampling Date : - **Date of Testing :** 9-Dec-14 **Tested by :** Perera/Bala

Sample No. : OF-05-3b D-3(10.20-10.93m) **Ref. No.** -

Soil Type :	Silty Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.74	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	8.8	10.7	12.6	14.9	16.5	18.2		
Wet Density (Mg/m3)	1.726	1.773	1.833	1.908	1.949	1.946		
Dry Density (Mg/m3)	1.587	1.602	1.628	1.660	1.673	1.646		

Maximum Dry Density	**1.673 Mg/m3**
Optimum Water Content	**16.5 %**



160

16) LD-12-1

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			LD-12-1								
Sample No.			HP-1Top	HP-1Bottom	D-1	D-2	D-3	D-4	D-5	D-6	
Sample Depth			2.00m ~2.35m	2.35m ~2.90m	5.00m ~5.80m	8.00m ~8.85m	11.00m ~11.50m	14.00m ~14.80m	17.00m ~17.60m	23.00m ~23.60m	
Condition of Sample			Undisturbed		Disturbed						
Natural Water Content		%	-	29.1	17.8	19.1	19.7	25.2	18.1	22.0	
Specific Gravity			-	2.72	2.68	2.68	2.70	2.69	2.68	2.72	
Wet Density		Mg/m^3	1.79	1.95	-	-	-	1.92	-	2.04	
Dry Density		Mg/m^3	-	1.51	-	-	-	1.53	-	1.67	
Natural Void Ratio			-	0.80	-	-	-	0.75	-	0.63	
Degree of Saturation		%	-	99	-	-	-	90	-	95	
Atterberg Limits	Liquid Limit,	%	-	- *3	- *3	- *3	- *3	- *3	- *3	28	
	Plastic Limit,	%	-	- *3	- *3	- *3	- *3	- *3	- *3	15	
	Plasticity Index,	%	-	- *3	- *3	- *3	- *3	- *3	- *3	13	
Grain Size Analysis	Gravel,	%	-	0	0	0	0	0	0	0	
	Sand,	%	-	38	74	92	95	55	95	34	
	Silt,	%	-	38	12	8	5	23	5	25	
	Clay & Colloid,	%	-	24	14			22		41	
	Max. diameter,	mm	-	0.425	4.75	2.00	2.00	4.75	2.00	2.00	
	Diam. at 60%	mm	-	0.067	0.30	0.32	0.32	0.13	0.36	0.025	
	Diam. at 10%	mm	-	-	-	0.091	0.096	-	0.15	-	
Visual soil description			Clay with Organic Matter	Sandy Silt	Clayey Sand	Sand with Clay	Sand with Clay	Silty Sand	Sand with Clay	Sandy Clay	
Unified soil classification			-	-	-	-	-	-	-	CL	
Triaxial compression test	Angle of Internal Friction	(^{0})	-	0	-	-	-	-	-	-	
	Cohesion Intercept, kPa		-	57	-	-	-	-	-	-	
	Condition of drainage		-	UU	-	-	-	-	-	-	
	Angle of Internal Friction *2	(^{0})	-	-	39	39	37	-	41	-	
	Cohesion Intercept, kPa *2		-	-	0	0	0	-	0	-	
	Condition of drainage		-	-	CD*6	CD*5	CD*6	-	CD*6	-	
Consolidation Test	Preconsolidation Pressure,	kPa	-	-	-	-	-	-	-	-	
	Compression Index(Average)		-	0.22	-	-	-	-	-	-	
	Pressure Range for Compression Index(kPa)		-	1600-3200	-	-	-	-	-	-	
	Swell index		-	0.039	-	-	-	-	-	-	
Compaction Test *4	Maximum Dry Density, Mg/m^3		-	-	1.69	-	1.71	-	1.70	-	
	Optimum Moisture Content , %		-	-	14.4	-	13.5	-	14.1	-	
Unconfined Compression Strength (kPa)			-	-	-	-	-	-	-	-	
Strain at failure (%)			-	-	-	-	-	-	-	-	

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand *4 : By using 2.5 kg Rammer

*5 : Specimens are prepared at required saturated wet density *6 : Specimens are prepared at 90% of Maximum dry density

Checked by : A. B. Tan

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **25.10.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

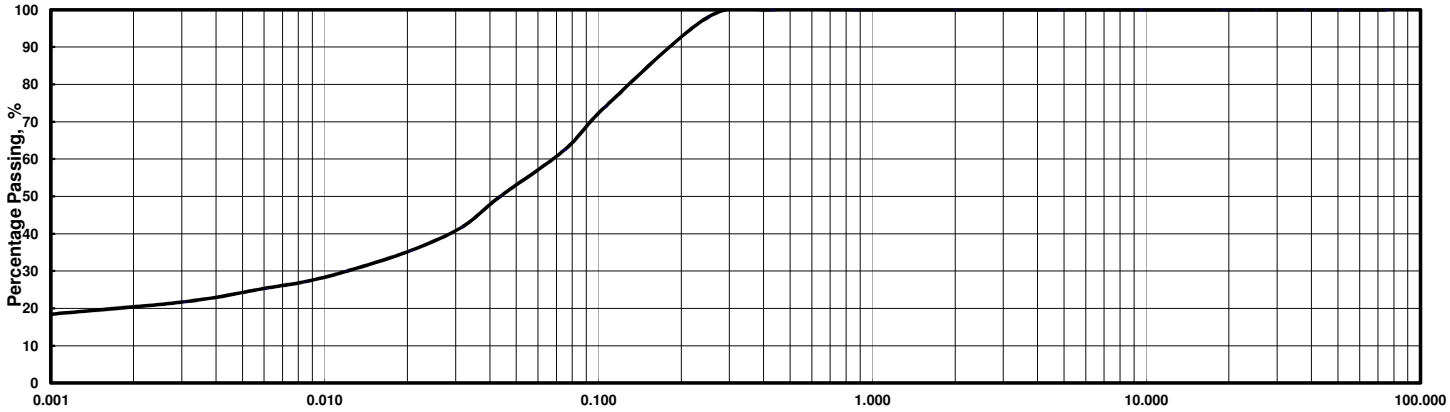
Sample No. : **LD-12-1 HP-1B** Depth : **2.35-2.90m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97.9	74.1	62.5
Hydro.	Dia., mm	0.043	0.032	0.020	0.012	0.0085	0.0060	0.0031	0.0009							
	% Passing	49.9	41.7	35.4	29.9	27.2	25.4	21.8	18.1							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD-12-1 HP-1B 2.35-2.90m			Sample No. Depth	LD-12-1 HP-1B 2.35-2.90m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.425	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.067	mm
2.00 - 0.425 mm	0.0	%		Dia. at 30%	0.012	mm
0.425 - 0.075 mm	37.5	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	38.4	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	24.1	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	62.5	%				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **17.10.14** Tested By : **Htet Paing/Motiur** Checked by : **A. B. Tan**

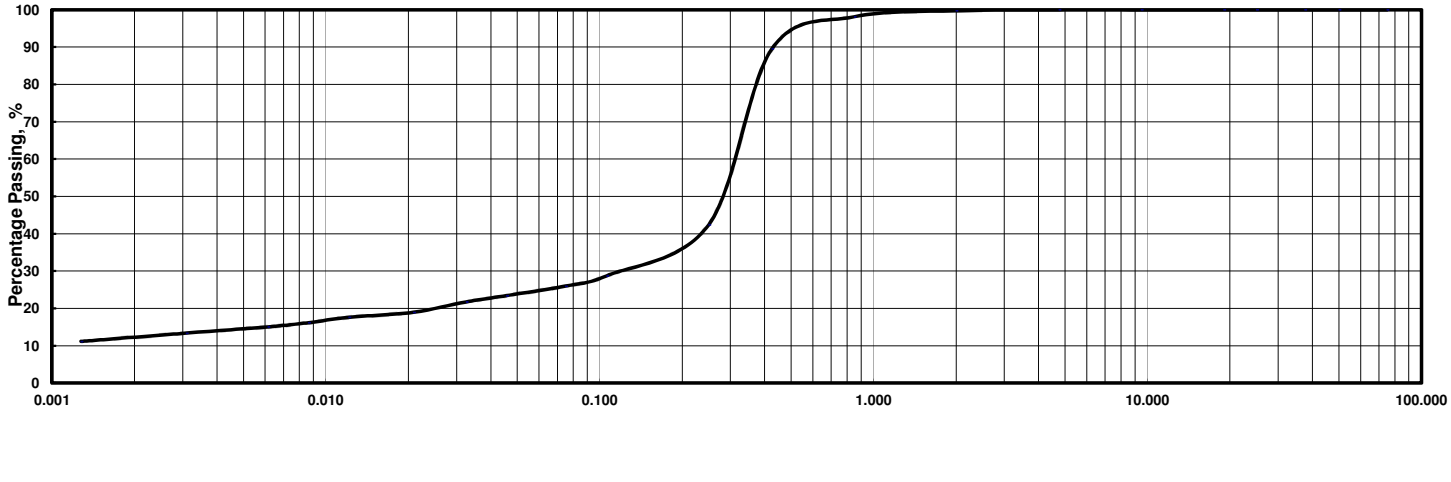
Sample No. : **LD-12-1 D-1** Depth : **5.00-5.80m** ( ) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	98.1	89.5	42.4	28.7	26.0
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	23.4	21.7	19.0	17.6	16.2	15.1	13.4	11.2							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD-12-1 D-1 5.00-5.80m			Sample No. Depth	LD-12-1 D-1 5.00-5.80m		
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm	
4.75 - 2.00 mm	0.3	%		Dia. at 60%	0.30	mm	
2.00 - 0.425 mm	10.2	%		Dia. at 30%	0.11	mm	
0.425 - 0.075 mm	63.5	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	11.5	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	14.4	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	98.1	%					
75um Sieve Passing	26.0	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **21.10.14** Tested By : **Shariful** Checked by : **A. B. Tan**

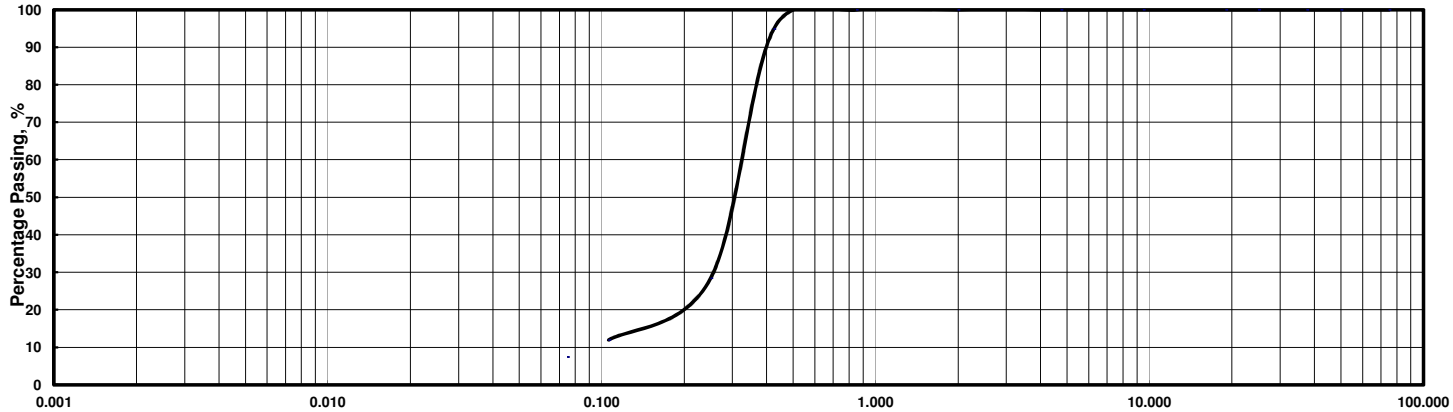
Sample No. : **LD-12-1 D-2** Depth : **8.00-8.85m** ( ) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.9	28.5	12.0	7.5
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	LD-12-1 D-2 8.00-8.85m			Sample No. Depth	LD-12-1 D-2 8.00-8.85m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.32	mm
2.00 - 0.425 mm	5.1	%		Dia. at 30%	0.25	mm
0.425 - 0.075 mm	87.4	%		Dia. at 10%	0.091	mm
0.075 - 0.005 mm	7.5	%		Coeff. of Uniformity	3.53	
Smaller than 0.005 mm				Coeff. of Curvature	2.19	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	7.5	%				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **21.10.14** Tested By : **Shariful** Checked by : **A. B. Tan**

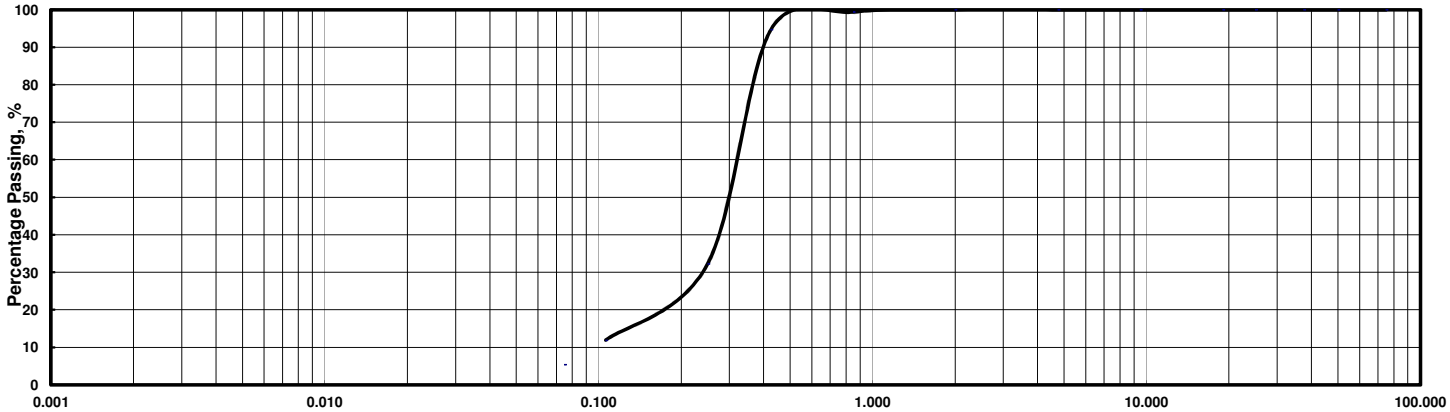
Sample No. : **LD-12-1 D-3** Depth : **11.00-11.50m** ( ) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	94.7	32.3	11.9	5.4
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD-12-1 D-3 11.00-11.50m		Sample No. Depth	LD-12-1 D-3 11.00-11.50m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.32 mm	
2.00 - 0.425 mm	5.3 %		Dia. at 30%	0.23 mm	
0.425 - 0.075 mm	89.3 %		Dia. at 10%	0.096 mm	
0.075 - 0.005 mm	5.4 %		Coeff. of Uniformity	3.31	
Smaller than 0.005 mm			Coeff. of Curvature	1.70	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.4 %				
75um Sieve Passing	5.4 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **17.10.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

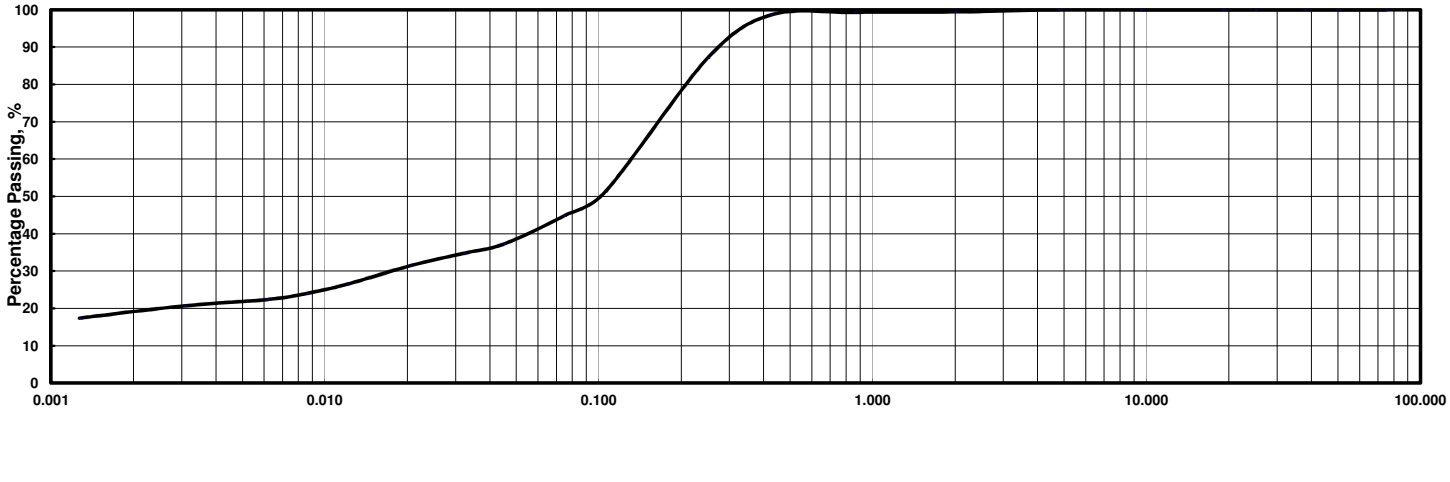
Sample No. : **LD-12-1 D-4** Depth : **14.00-14.80m** ( ) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	99.3	98.6	87.1	51.3	44.8
Hydro.	Dia., mm	0.045	0.032	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	37.3	34.8	31.5	26.5	24.0	22.4	20.7	17.4							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD-12-1 D-4 14.00-14.80m			Sample No. Depth	LD-12-1 D-4 14.00-14.80m		
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm	
4.75 - 2.00 mm	0.6	%		Dia. at 60%	0.13	mm	
2.00 - 0.425 mm	0.8	%		Dia. at 30%	0.018	mm	
0.425 - 0.075 mm	53.8	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	23.1	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	21.7	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.3	%					
75um Sieve Passing	44.8	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **21.10.14** Tested By : **Shariful** Checked by : **A. B. Tan**

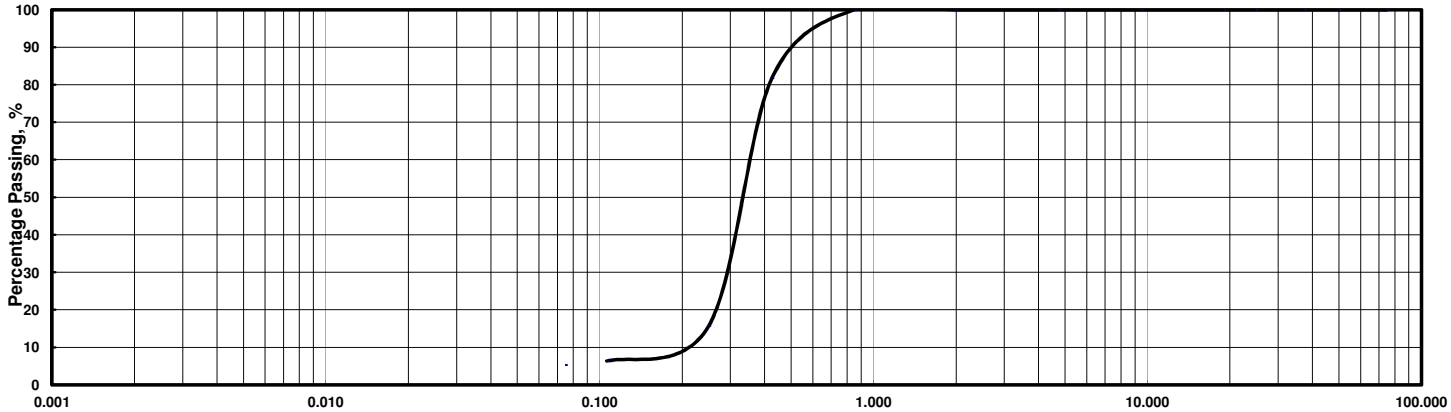
Sample No. : **LD-12-1 D-5** Depth : **17.00-17.60m** ( ) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	81.7	15.7	6.3	5.4
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD-12-1 D-5 17.00-17.60m		Sample No. Depth	LD-12-1 D-5 17.00-17.60m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.36 mm	
2.00 - 0.425 mm	18.3 %		Dia. at 30%	0.28 mm	
0.425 - 0.075 mm	76.4 %		Dia. at 10%	0.15 mm	
0.075 - 0.005 mm	5.4 %		Coeff. of Uniformity	2.41	
Smaller than 0.005 mm			Coeff. of Curvature	1.49	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	5.4 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **20.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

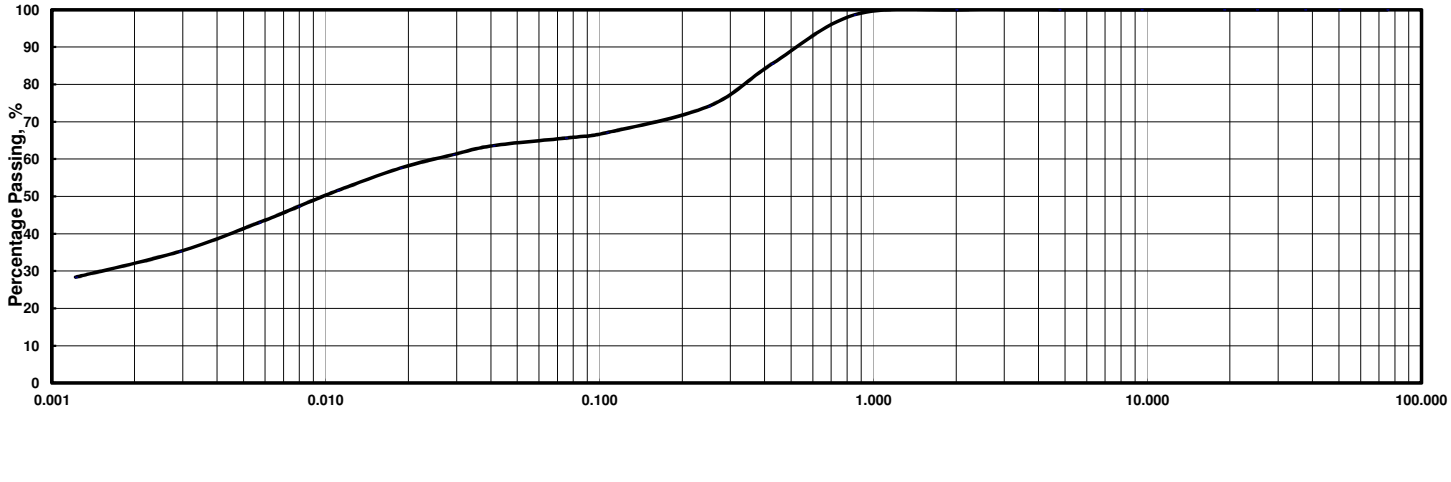
Sample No. : **LD-12-1 D-6** Depth : **23.00-23.60m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.6	85.5	74.2	67.1	65.6
Hydro.	Dia., mm	0.041	0.029	0.019	0.011	0.0079	0.0057	0.0029	0.0012							
	% Passing	63.6	61.2	57.6	51.6	47.3	43.0	35.2	28.4							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



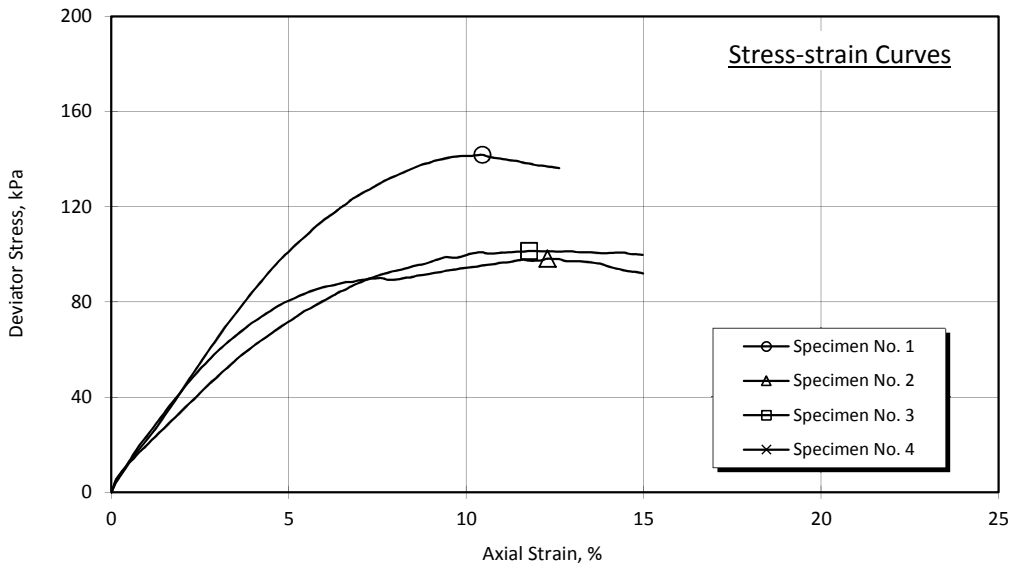
0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD-12-1 D-6 23.00-23.60m		Sample No. Depth	LD-12-1 D-6 23.00-23.60m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.025 mm	
2.00 - 0.425 mm	14.5 %		Dia. at 30%	0.0015 mm	
0.425 - 0.075 mm	19.9 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	24.6 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	41.0 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	98.6 %				
75um Sieve Passing	65.6 %				

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

Project :	Preparatory Survey on Matarbari USC Coral-fired Power Project	Project No. :	S27-14
Standard :	ASTM D2850-03a	Date of Testing :	23.10.14
Borehole No.:	LD-12-1 Depth : 2.35-2.90m	Tested by :	Perera
Sample No. :	HP-1B Strain Rate 1.00 %/min	Checked by :	A. B. Tan

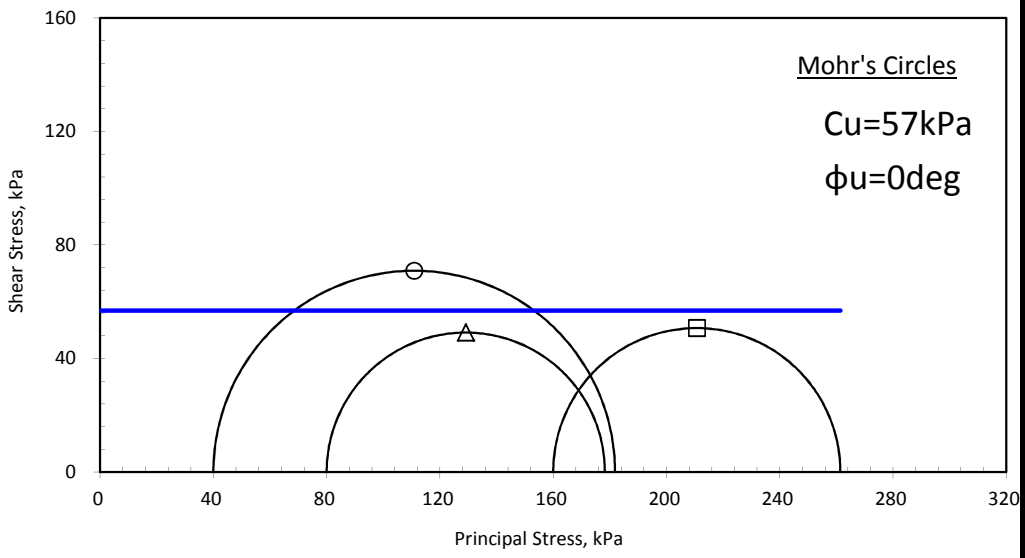
Specimen No.	Condition of Sample	Size of Specimen (mm)		Natural Water Content	Bulk Density	Dy Density	Cell Pressure	Peak Deviator Stress	Modulus of Deformation	Corrected Initial Strain	Strain at Failure
		Height	Diameter	(%)	(Mg/m3)	(Mg/m3)	(kPa)	(kPa)	E50 (kPa)	(%)	(%)
1	Undisturbed	99.80	50.00	29.5	1.90	1.46	40	141.8	2159	N/A	10.45
2	Undisturbed	99.80	50.00	26.4	1.94	1.54	80	98.2	2098	N/A	12.28
3	Undisturbed	99.80	50.00	28.1	1.90	1.48	160	101.4	1616	N/A	11.76
4											



After shearing (Spec. 1)

After shearing (Spec. 2)

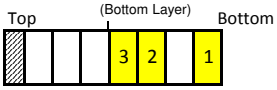
After shearing (Spec. 3)



After shearing (Spec. 4)

Remarks :
- [Strain at failure]=[Recorded strain at failure] - [Corrected Initial Strain]
- Latex membrane with 0.2mm in thickness is used.
- Membrane correction is carried out based on BS 1377 : 1990

Portion Tested



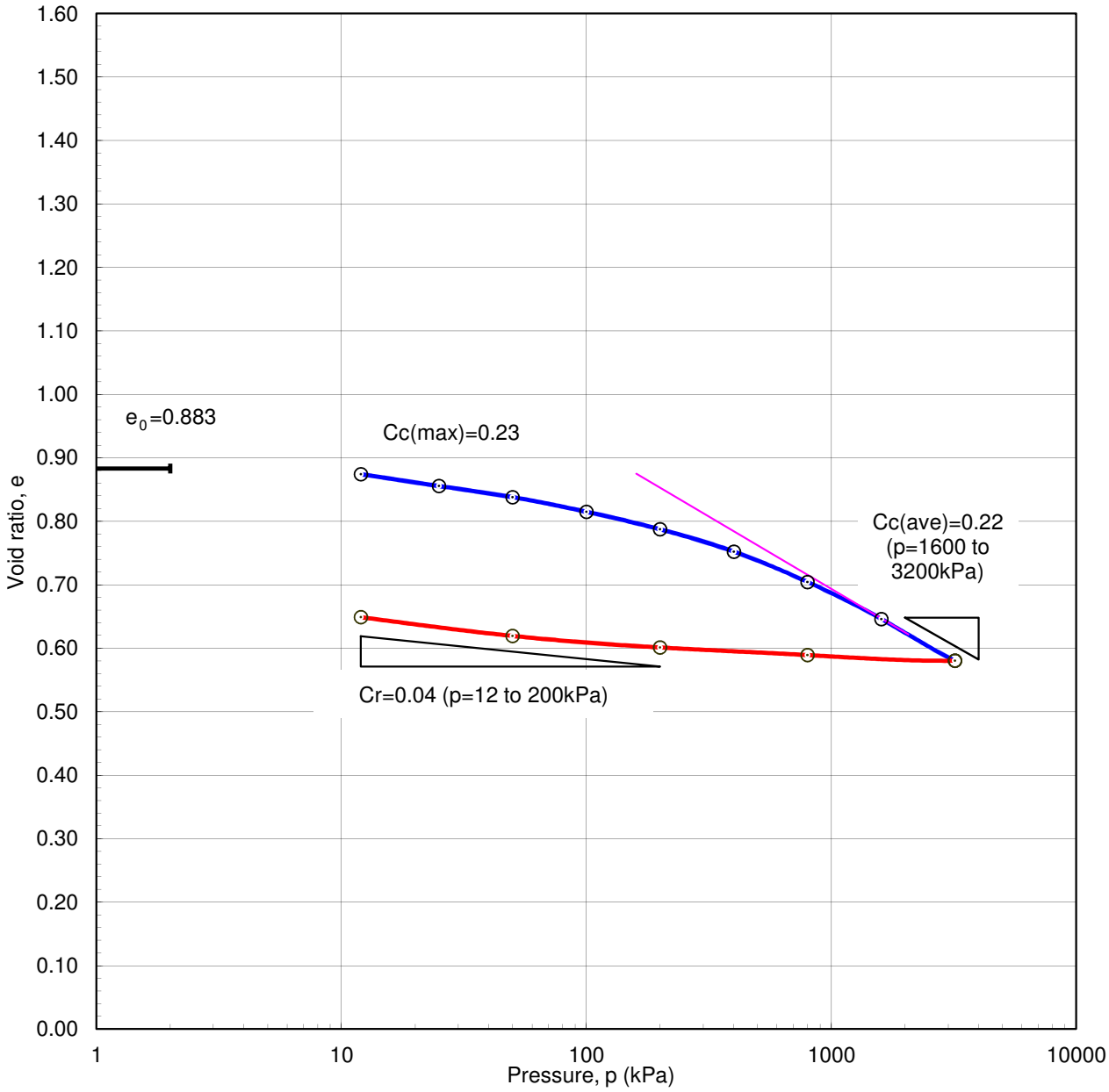
Kiso-Jiban Consultants Co Ltd
Singapore Branch

CONSOLIDATION TEST (e-log p curves)

Preparatory Survey on Matarbari USC Coal-fired Power

Project :	Project			Borehole No. :	LD-12-1
Project No.:	S27-14	Tested by :	Lim	Sample No. :	HP-1B
Soil Type :	Sandy Silt	Checked by :	A. B. Tan	Depth of Sample :	2.35-2.90 m

Sample No.	Depth of sample (m)	Initial void ratio e_o	Preconsolidation Pressure, p_c (kPa)	Compression Index Cc		Swell Index Cr	Unload-reload-Compression Index Cur
HP-1B	2.35-2.90	0.883	-	0.23 (max)	0.22(average)	0.039 (average)	N/A

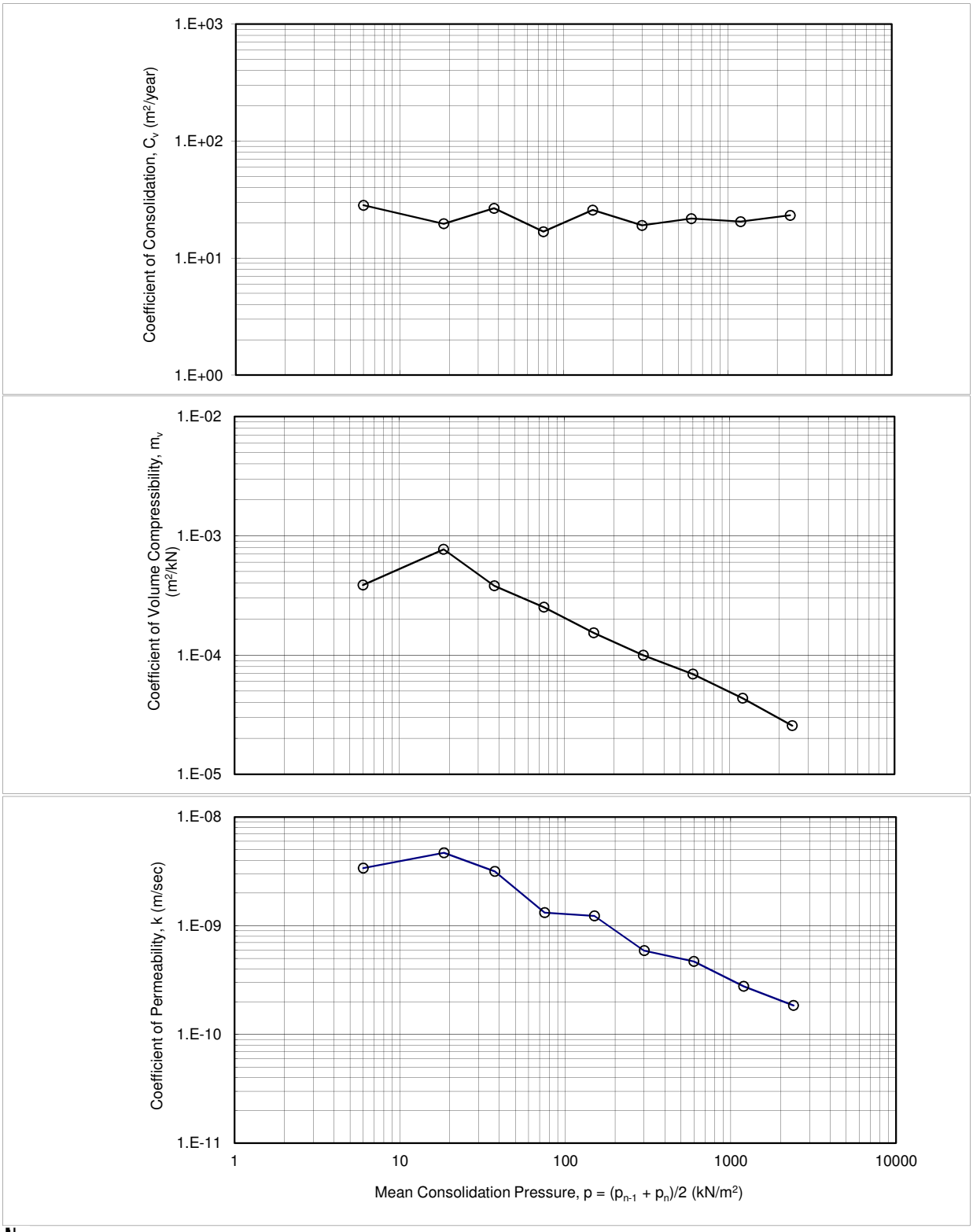


KISO-JIBAN CONSULTANTS CO., LTD.

171

Consolidation Test (p - $\overline{c}v$, mv , k curves)

Project :	Preparatory Survey on Matarbari USC Coal-fired Power Project			Borehole No. :	LD-12-1
Project No. :	S27-14			Sample No. :	HP-1B
Date of testing :	17-Oct-14	Tested by :	Lim	Depth of Sample :	2.35-2.90 m



KISO-JIBAN CONSULTANTS CO., LTD.

PROJECT NAME : Preparatory Survey on Matarbari USC Coal-fired Power Project
PROJECT NO. : S27-14
BOREHOLE NO. : LD-12-1
TESTING STANDARD : ASTM D2435-11
DATE : 17-Oct-14
SAMPLE NO. : HP-1B
INITIAL HEIGHT OF SPECIMEN : 18.000 mm
NO. OF LOADING STEP : 9
DEPTH : 2.35-2.90 m
DIAMETER OF SPECIMEN : 53.900 mm
SPECIFIC GRAVITY : 2.72
TESTER NO. : 17
DRY WEIGHT OF SPECIMEN : 59.340 grams
SOLID HEIGHT OF SPECIMEN : 9.560 mm
INITIAL MOISTURE CONTENT : 30.7 %
BULK DENSITY : 1.89 Mg/m^3
METHOD OF TIME FITTING USED : SQUARE ROOT TIME CURVE - FITTING METHOD
LABORATORY TEMPERATURE : 23.0 ^oC

PRESSURE kN/m^2	PRESSURE INCREMENT kN/m^2	CHANGE IN HEIGHT *E-2 mm	HEIGHT mm	AVERAGE HEIGHT mm	STRAIN %	MV m^2/kN	VOLUME RATIO	VOID RATIO
0.000			18.000				1.883	0.883
	12.000	8.3		17.959	0.46	3.85E-04		
12.000			17.917				1.874	0.874
	13.000	17.8		17.828	1.00	7.68E-04		
25.000			17.739				1.856	0.856
	25.000	16.8		17.655	0.95	3.81E-04		
50.000			17.571				1.838	0.838
	50.000	22.0		17.461	1.26	2.52E-04		
100.000			17.351				1.815	0.815
	100.000	26.4		17.219	1.53	1.53E-04		
200.000			17.087				1.787	0.787
	200.000	33.7		16.919	1.99	9.96E-05		
400.000			16.750				1.752	0.752
	400.000	45.7		16.522	2.77	6.92E-05		
800.000			16.293				1.704	0.704
	800.000	55.6		16.015	3.47	4.34E-05		
1600.000			15.737				1.646	0.646
	1600.000	63.0		15.422	4.09	2.55E-05		
3200.000			15.107				1.580	0.580

PRESSURE kN/m^2	AVERAGE PRESSURE kN/m^2	T90 min	CV m^2/sec	CV m^2/day	CV $m^2/year$	PRIMARY COMPRESSION *E-2 mm	PRIMARY COMPRESSION RATIO	COEFFICIENT OF PERMEABILITY m/sec
0.000								
	6.000	1.18	8.96E-07	7.74E-02	2.83E+01	1.6	0.194	3.38E-09
12.000								
	18.500	1.68	6.23E-07	5.38E-02	1.96E+01	2.2	0.126	4.69E-09
25.000								
	37.500	1.21	8.46E-07	7.31E-02	2.67E+01	2.7	0.162	3.16E-09
50.000								
	75.000	1.88	5.33E-07	4.60E-02	1.68E+01	3.4	0.154	1.32E-09
100.000								
	150.000	1.19	8.17E-07	7.06E-02	2.58E+01	3.8	0.143	1.23E-09
200.000								
	300.000	1.56	6.03E-07	5.21E-02	1.90E+01	5.2	0.156	5.89E-10
400.000								
	600.000	1.30	6.90E-07	5.96E-02	2.18E+01	6.5	0.142	4.68E-10
800.000								
	1200.000	1.30	6.50E-07	5.62E-02	2.05E+01	8.4	0.152	2.77E-10
1600.000								
	2400.000	1.06	7.36E-07	6.36E-02	2.32E+01	8.7	0.137	1.84E-10
3200.000								

REBOUND

P	800.000	200.000	50.000	12.000
H	15.193	15.307	15.481	15.764
E	0.589	0.601	0.619	0.649

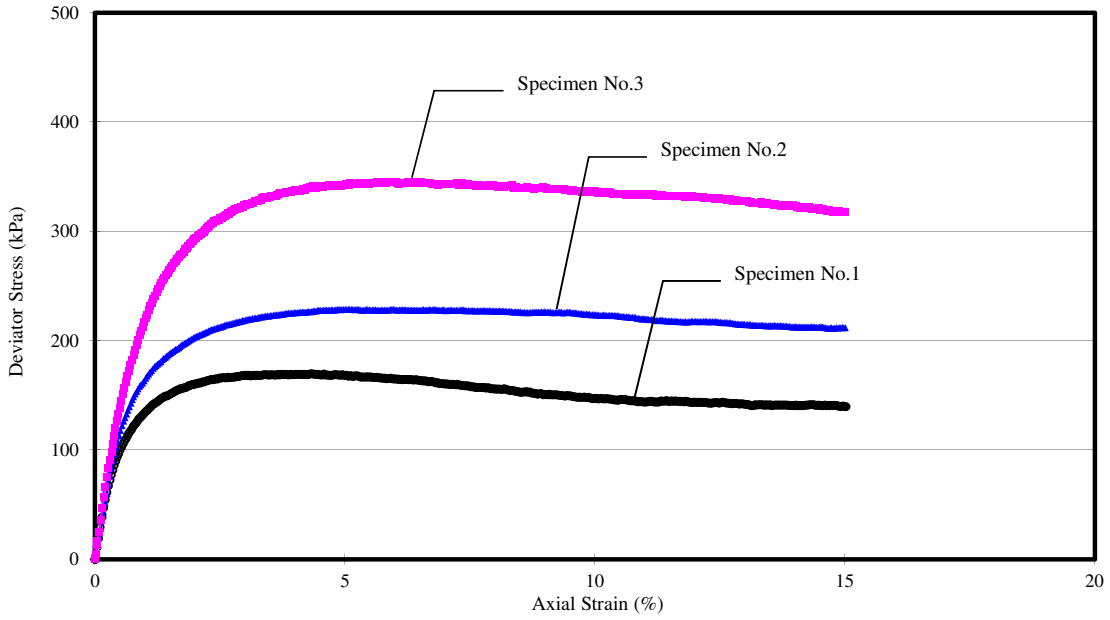
KISO-JIBAN CONSULTANTS CO., LTD.

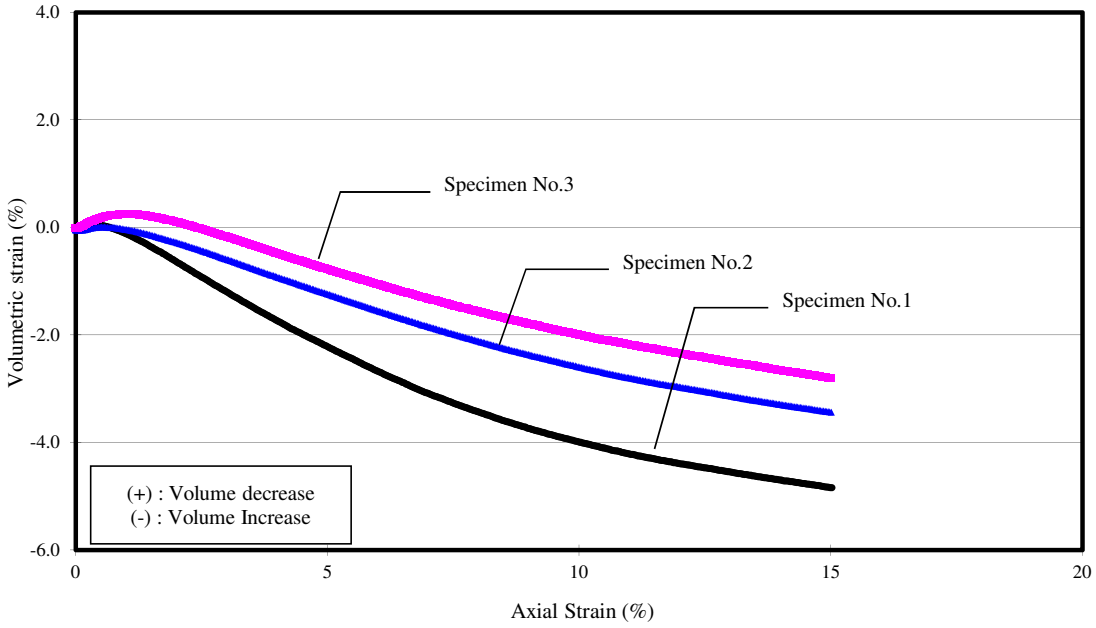
Summary of Consolidated Drained Triaxial Compression Test

Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 09.12.14		Tested by : Perera		Checked by : A. B. Tan			
Borehole No.: LD-12-1		Sample No.:D-1		Depth : 5.00-5.80m			
Specimen Condition : Remoulded		Test Method : ASTM D7181-11					
Soil Description : Clayey Sand		Ave. Diameter : 50.0mm		Ave. Height : 100.0mm			
Specimen No.			1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.52	1.52	1.52		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	570	600		
	B-value		0.96	0.96	0.97		
Consolidation Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	529	558	587		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.04	0.06	0.15		
	Coefficient of Consolidation Cv,	m^2/year	614	444	542		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.009	0.009	0.015		
Compression Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	170	229	345		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-1.90	-1.53	-1.04		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	4.33	5.97	5.96		
Shear Strength Parameters	ϕ_d = 39 Degree c_d = 0 kPa		Mode of Failure				
			1	2	3	4	
Remarks : Specimens are prepared at 90% of Maximum dry density (from compaction Test) = 1.52Mg/m^3							

Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-1 Soil Type: Clayey Sand
Borehole No.: LD-12-1 Depth : 5.00-5.80m





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

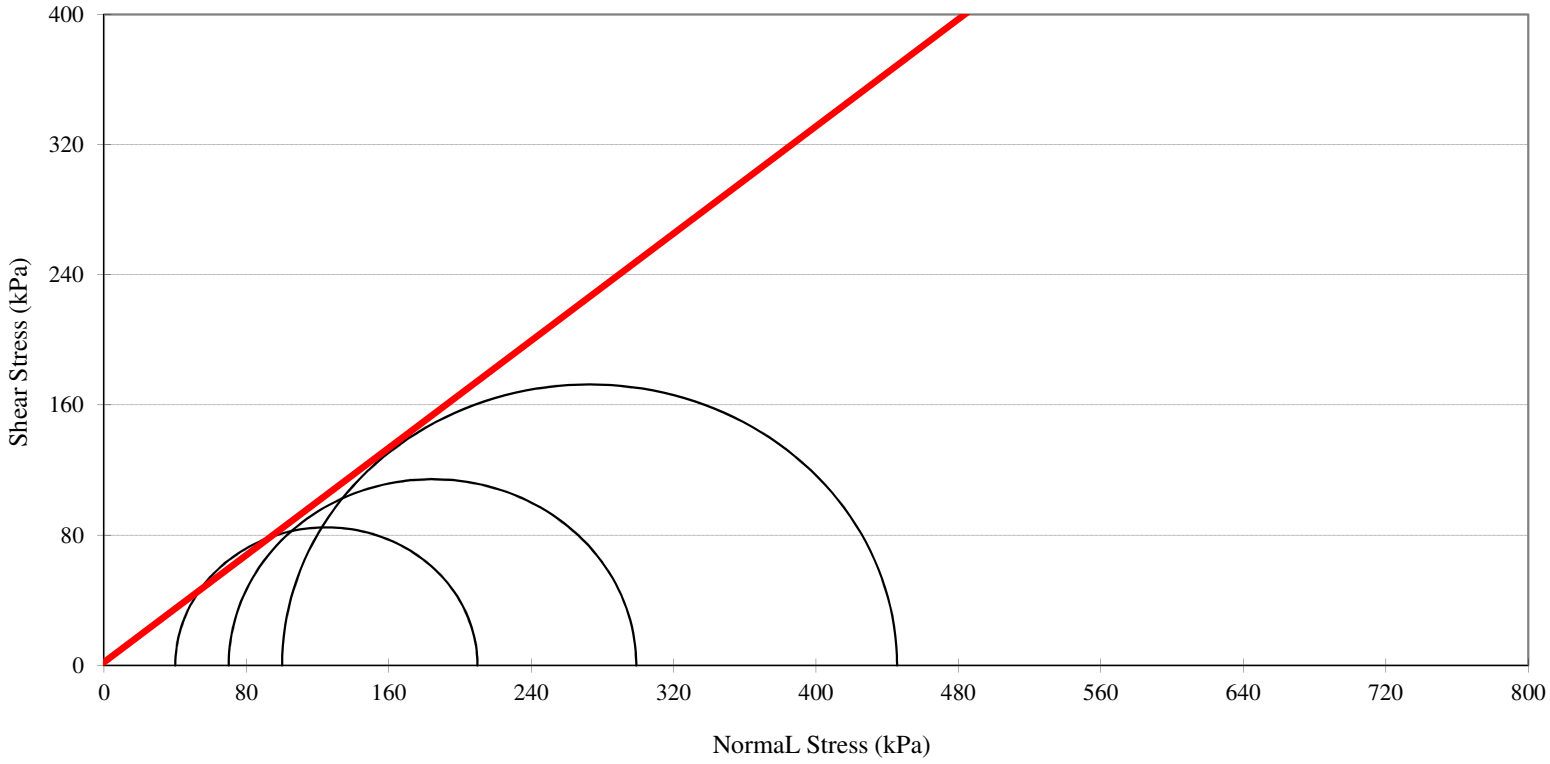
Project No. : S27-14

Borehole No. : LD-12-1 Soil Type: Clayey Sand

Sample No. : D-1 Depth : 5.00-5.80m

Angle of Internal Friction, ϕ_d 39 deg

Cohesion, c_d 0 kPa



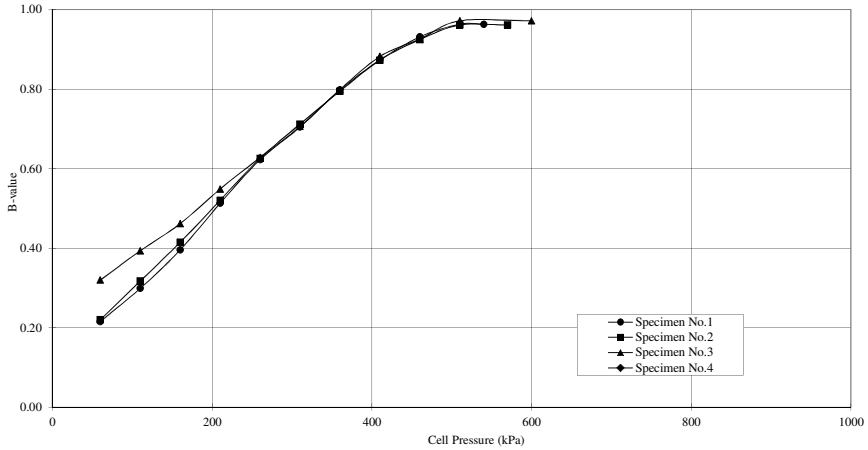
Kiso-Jiban Consultants Co., Ltd.

176

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

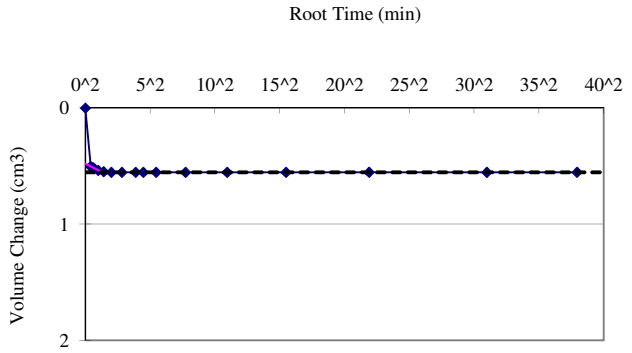
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: LD-12-1 Depth : 5.00-5.80m
Sample No.: D-1 Soil Type: Clayey Sand

		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	26.5	20	26.6	20	29.6		
	Back Pressure (kPa)	20		20		20			
	B-value	0.22		0.22		0.32			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	64.9	50	65.9	50	69.7		
	Back Pressure (kPa)	50		50		50			
	B-value	0.30		0.32		0.39			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	119.8	100	120.7	100	123.1		
	Back Pressure (kPa)	100		100		100			
	B-value	0.40		0.41		0.46			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	175.6	150	176.0	150	177.4		
	Back Pressure (kPa)	150		150		150			
	B-value	0.51		0.52		0.55			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	231.1	200	231.3	200	231.4		
	Back Pressure (kPa)	200		200		200			
	B-value	0.62		0.63		0.63			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	285.2	250	285.6	250	285.3		
	Back Pressure (kPa)	250		250		250			
	B-value	0.70		0.71		0.71			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	339.9	300	339.7	300	339.9		
	Back Pressure (kPa)	300		300		300			
	B-value	0.80		0.79		0.80			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	393.6	350	393.6	350	394.1		
	Back Pressure (kPa)	350		350		350			
	B-value	0.87		0.87		0.88			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	446.6	400	446.2	400	446.3		
	Back Pressure (kPa)	400		400		400			
	B-value	0.93		0.92		0.93			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	498.2	450	498.1	450	498.6		
	Back Pressure (kPa)	450		450		450			
	B-value	0.96		0.96		0.97			
B-check Step.11	Cell Pressure (kPa)	510	540	510	570	510	600		
	P.W.P (kPa)	500	528.9	500	557.7	500	587.5		
	Back Pressure (kPa)	500		500		500			
	B-value	0.96		0.96		0.97			



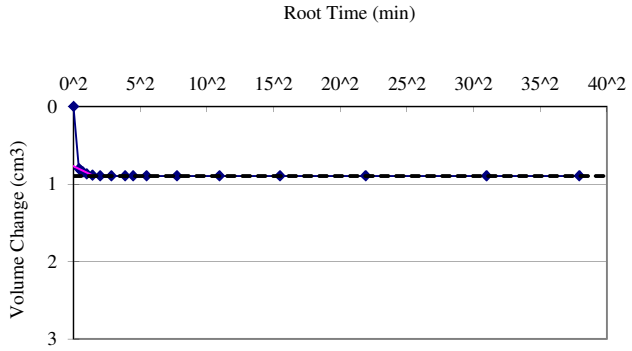
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: LD-12-1 Soil Type: Clayey Sand
Sample No.: D-1 Depth : 5.00-5.80m



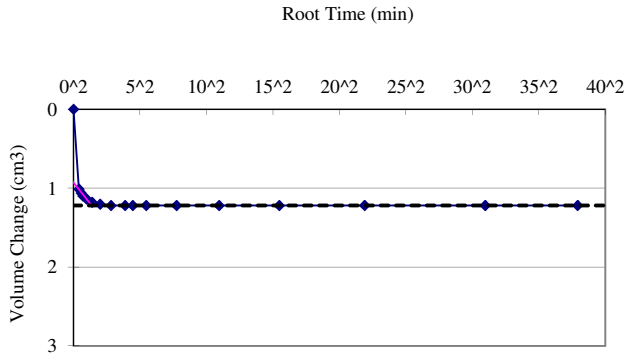
Specimen No.: 1

p' =	40	kPa
t100 =	1.7	min
Cv =	614	m^2/year
mvi=	0.009	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	2.3	min
Cv =	444	m^2/year
mvi=	0.009	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	1.9	min
Cv =	542	m^2/year
mvi=	0.015	m^2/MN

Summary of Consolidated Drained Triaxial Compression Test

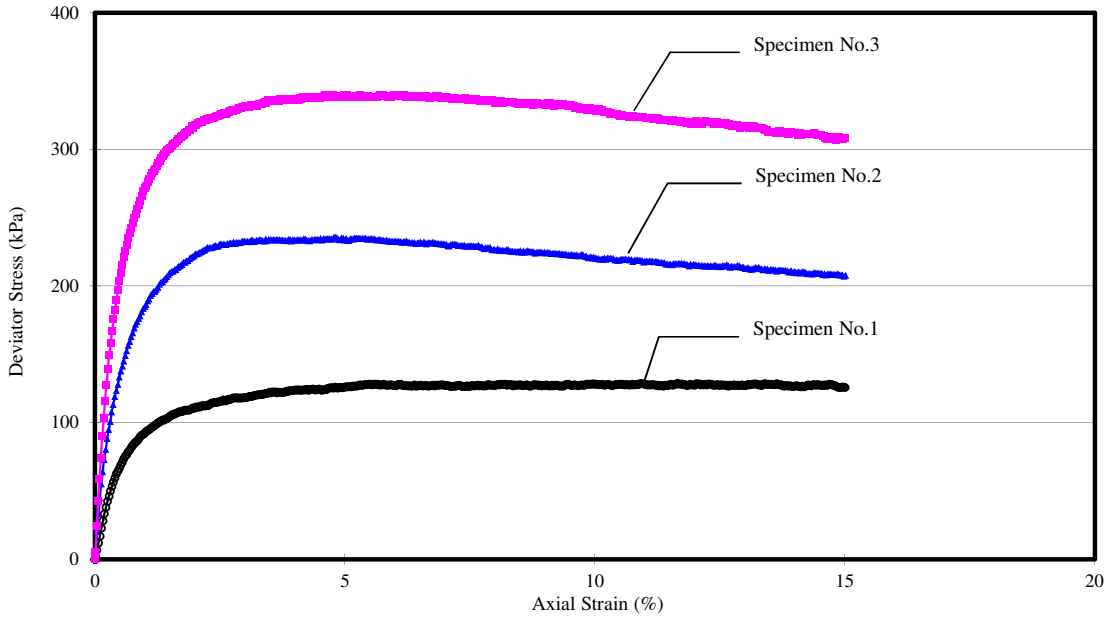
Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 14.12.14		Tested by : Rahim		Checked by : A. B. Tan			
Borehole No.: LD-12-1		Sample No.:D-2		Depth : 8.00-8.85m			
Specimen Condition : Remoulded		Test Method : ASTM D7181-11					
Soil Description : Sand with Clay		Ave. Diameter : 50.0mm		Ave. Height : 100.0mm			
Specimen No.			1	2	3	4	
Initial Condition	Saturated Wet Density,	Mg/m^3	1.95	1.95	1.95		
	Water Content,	%	28.7	28.7	28.7		
	Dry Density	Mg/m^3	1.52	1.52	1.52		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	570	600		
	B-value		0.95	0.96	0.98		
Consolidation Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	529	557	588		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.05	0.09	0.10		
	Coefficient of Consolidation Cv,	m^2/year	898	711	719		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.013	0.013	0.010		
Compression Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	129	236	340		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-2.81	-1.73	-1.62		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	11.65	4.78	5.97		
Shear Strength Parameters	ϕ_d = 39 Degree c_d = 0 kPa		Mode of Failure				
			1	2	3	4	
Remarks : Specimens are prepared at required saturated wet density = 1.95 Mg/m3							

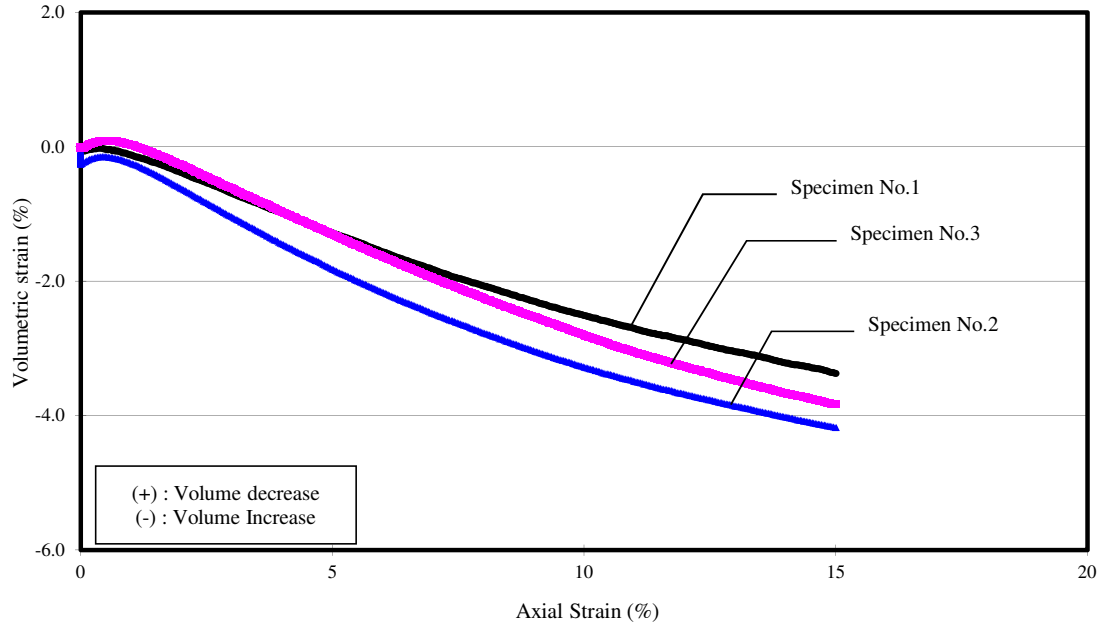
Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No.: S27-14 Sample No.: D-2 Soil Type: Sand with Clay

Borehole No.: LD-12-1 Depth : 8.00-8.85m





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

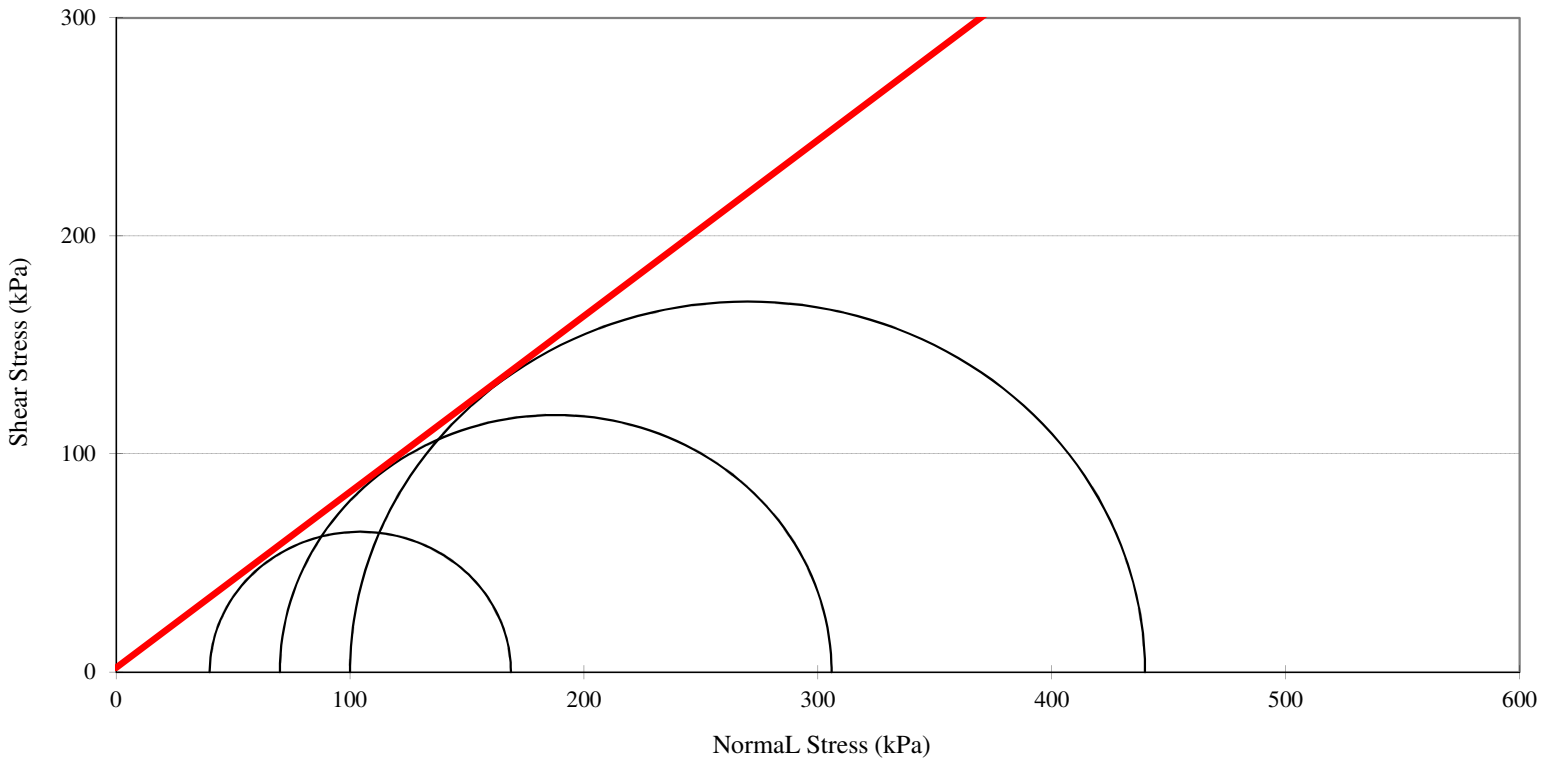
Project No. : S27-14

Borehole No. : LD-12-1 Soil Type: Sand with Clay

Sample No. : D-2 Depth : 8.00-8.85m

Angle of Internal Friction, ϕ_d 39 deg

Cohesion, c_d 0 kPa



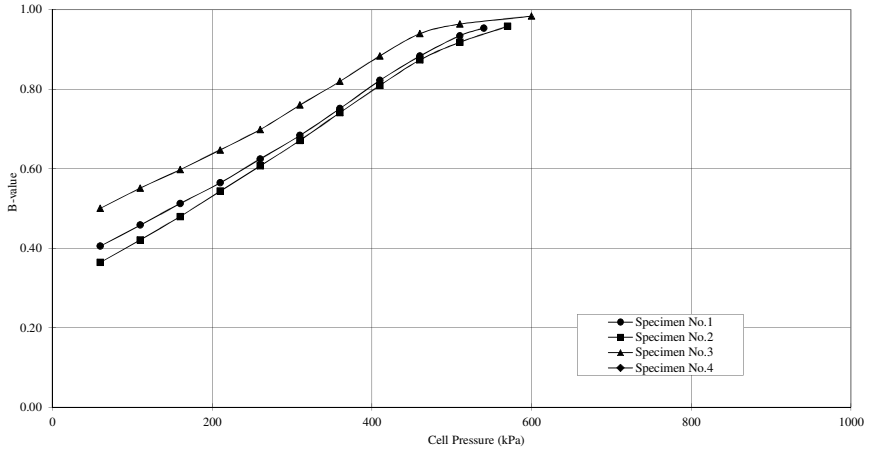
Kiso-Jiban Consultants Co., Ltd.

181

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

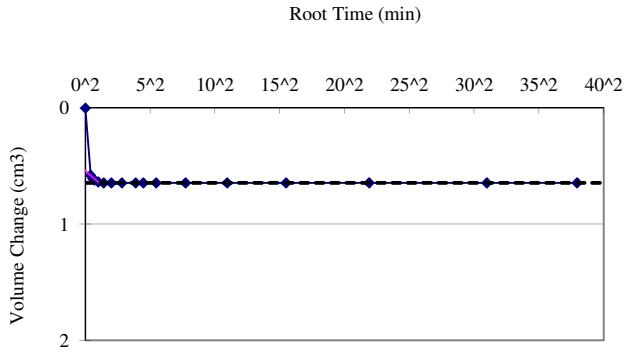
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: LD-12-1 Depth : 8.00-8.85m
Sample No.: D-2 Soil Type: Sand with Clay

		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	32.2	20	30.9	20	35.0		
	Back Pressure (kPa)	20		20		20			
	B-value	0.41		0.36		0.50			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	72.9	50	71.0	50	77.6		
	Back Pressure (kPa)	50		50		50			
	B-value	0.46		0.42		0.55			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	125.6	100	124.0	100	129.9		
	Back Pressure (kPa)	100		100		100			
	B-value	0.51		0.48		0.60			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	178.2	150	177.2	150	182.3		
	Back Pressure (kPa)	150		150		150			
	B-value	0.56		0.54		0.65			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	231.2	200	230.3	200	234.9		
	Back Pressure (kPa)	200		200		200			
	B-value	0.62		0.61		0.70			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	284.2	250	283.6	250	288.0		
	Back Pressure (kPa)	250		250		250			
	B-value	0.68		0.67		0.76			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	337.6	300	337.0	300	341.0		
	Back Pressure (kPa)	300		300		300			
	B-value	0.75		0.74		0.82			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	391.1	350	390.5	350	394.2		
	Back Pressure (kPa)	350		350		350			
	B-value	0.82		0.81		0.88			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	444.1	400	443.7	400	447.0		
	Back Pressure (kPa)	400		400		400			
	B-value	0.88		0.87		0.94			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	496.7	450	495.9	450	498.2		
	Back Pressure (kPa)	450		450		450			
	B-value	0.93		0.92		0.96			
B-check Step.11	Cell Pressure (kPa)	510	540	510	570	510	600		
	P.W.P (kPa)	500	528.6	500	557.5	500	588.5		
	Back Pressure (kPa)	500		500		500			
	B-value	0.95		0.96		0.98			



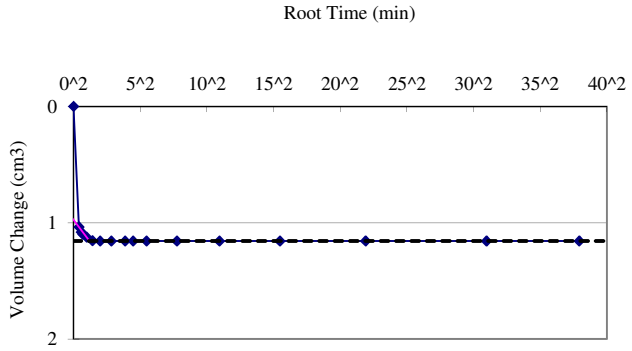
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: LD-12-1 Soil Type: Sand with Clay
Sample No.: D-2 Depth : 8.00-8.85m



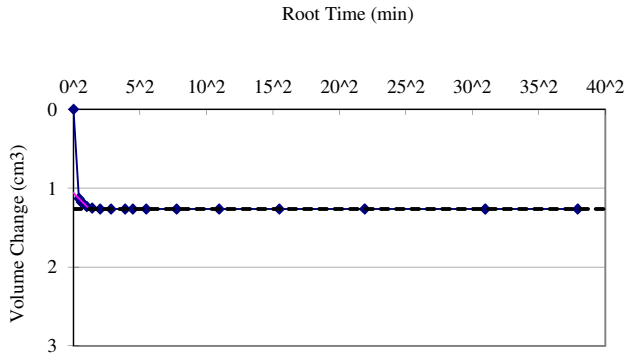
Specimen No.: 1

p' =	40	kPa
t100 =	1.1	min
Cv =	898	m^2/year
mvi=	0.013	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	1.4	min
Cv =	711	m^2/year
mvi=	0.013	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	1.4	min
Cv =	719	m^2/year
mvi=	0.010	m^2/MN

Summary of Consolidated Drained Triaxial Compression Test

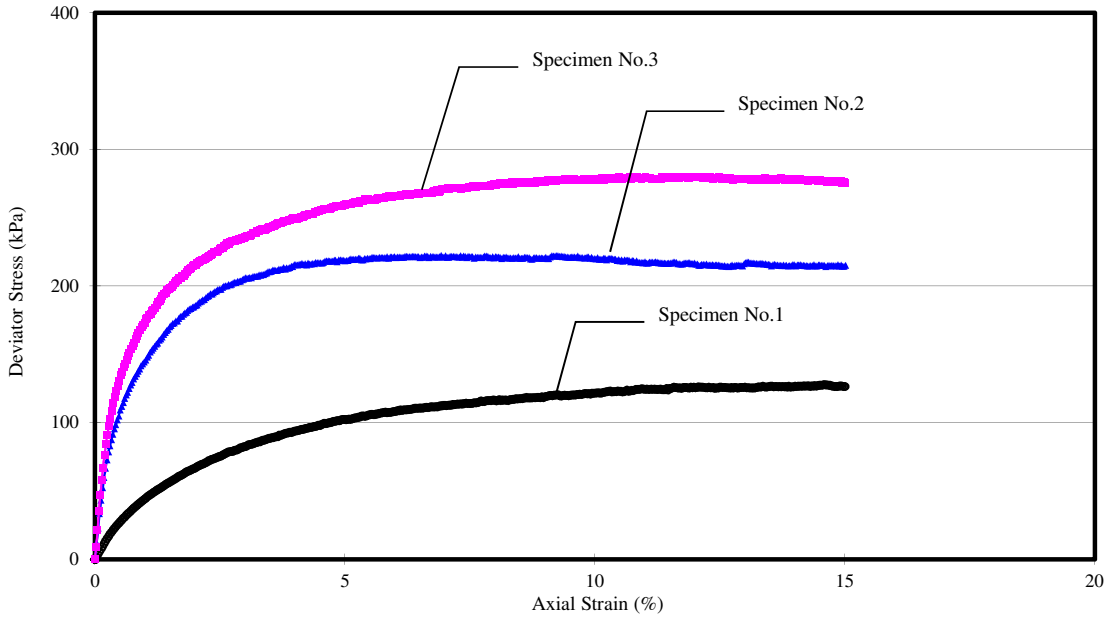
Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 09.12.14		Tested by : Rahim		Checked by : A. B. Tan			
Borehole No.: LD-12-1		Sample No.:D-3		Depth : 11.00-11.50m			
Specimen Condition : Remoulded		Test Method : ASTM D7181-11					
Soil Description : Sand with Clay		Ave. Diameter : 50.0mm		Ave. Height : 100.0mm			
Specimen No.			1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.54	1.54	1.54		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	570	600		
	B-value		0.96	0.96	0.97		
Consolidation Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	529	558	588		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.13	0.09	0.12		
	Coefficient of Consolidation Cv,	m^2/year	530	474	412		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.032	0.012	0.012		
Compression Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	128	222	280		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	0.67	-1.36	-0.84		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	14.58	6.92	11.98		
Shear Strength Parameters	ϕ_d = 37 Degree c_d = 0 kPa		Mode of Failure 1 2 3 4				
Remarks : Specimens are prepared at 90% of Maximum dry density (from compaction Test) = 1.54Mg/m^3							

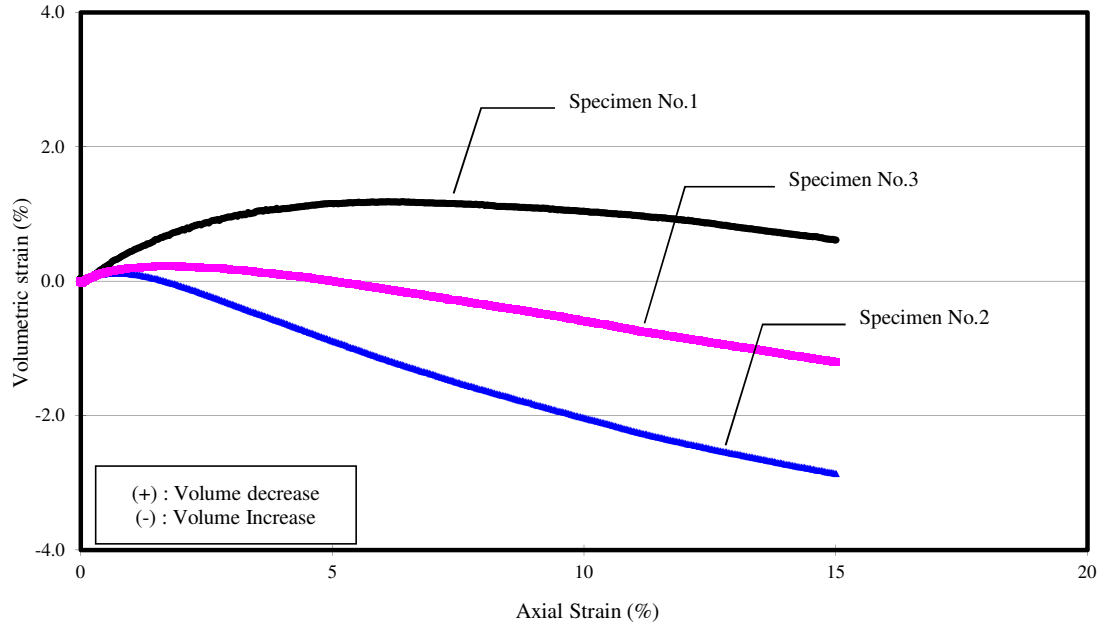
Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No.: S27-14 Sample No.: D-3 Soil Type: Sand with Clay

Borehole No.: LD-12-1 Depth : 11.00-11.50m





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

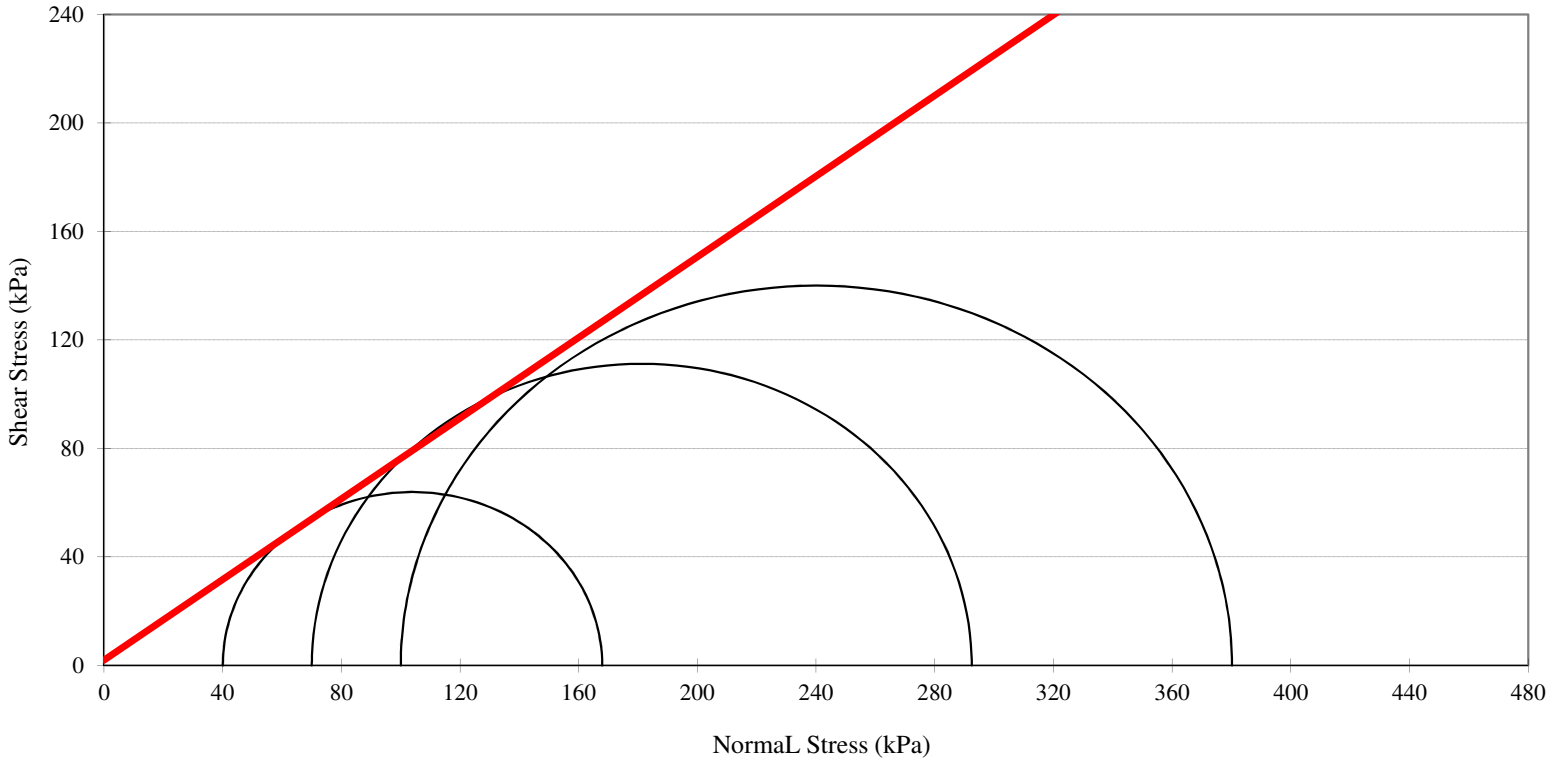
Project No. : S27-14

Borehole No. : LD-12-1 Soil Type: Sand with Clay

Sample No. : D-3 Depth : 11.00-11.50m

Angle of Internal Friction, ϕ_d 37 deg

Cohesion, c_d 0 kPa

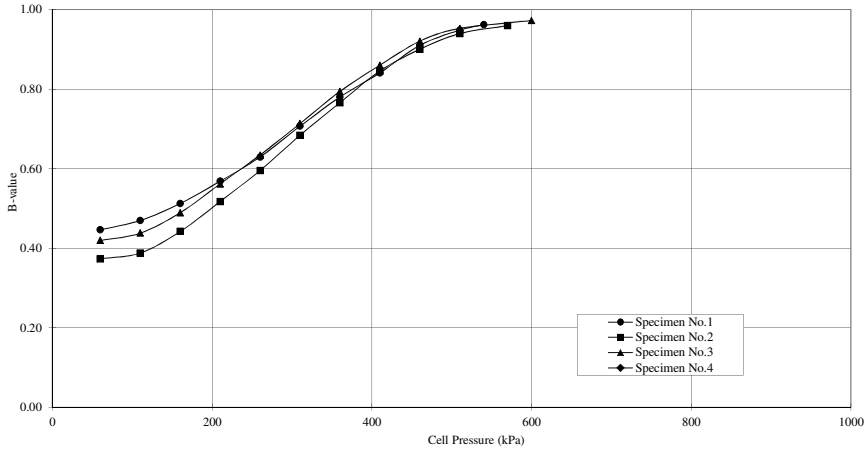


Kiso-Jiban Consultants Co., Ltd.

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: LD-12-1 Depth : 11.00-11.50m
Sample No.: D-3 Soil Type: Sand with Clay

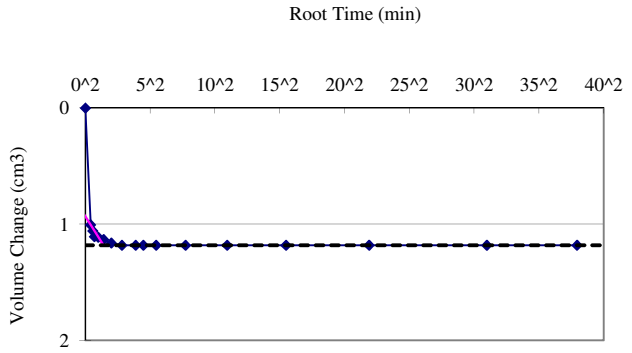
		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	33.4	20	31.2	20	32.6		
	Back Pressure (kPa)	20		20		20			
	B-value	0.45		0.37		0.42			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	73.5	50	69.4	50	71.9		
	Back Pressure (kPa)	50		50		50			
	B-value	0.47		0.39		0.44			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	125.6	100	122.1	100	124.5		
	Back Pressure (kPa)	100		100		100			
	B-value	0.51		0.44		0.49			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	178.4	150	175.9	150	178.1		
	Back Pressure (kPa)	150		150		150			
	B-value	0.57		0.52		0.56			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	231.5	200	229.8	200	231.7		
	Back Pressure (kPa)	200		200		200			
	B-value	0.63		0.60		0.63			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	285.3	250	284.2	250	285.7		
	Back Pressure (kPa)	250		250		250			
	B-value	0.71		0.68		0.71			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	339.0	300	338.3	300	339.7		
	Back Pressure (kPa)	300		300		300			
	B-value	0.78		0.77		0.79			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	392.0	350	392.3	350	393.0		
	Back Pressure (kPa)	350		350		350			
	B-value	0.84		0.85		0.86			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	445.5	400	445.0	400	446.0		
	Back Pressure (kPa)	400		400		400			
	B-value	0.91		0.90		0.92			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	497.4	450	497.0	450	497.6		
	Back Pressure (kPa)	450		450		450			
	B-value	0.95		0.94		0.95			
B-check Step.11	Cell Pressure (kPa)	510	540	510	570	510	600		
	P.W.P (kPa)	500	528.9	500	557.6	500	587.5		
	Back Pressure (kPa)	500		500		500			
	B-value	0.96		0.96		0.97			



187

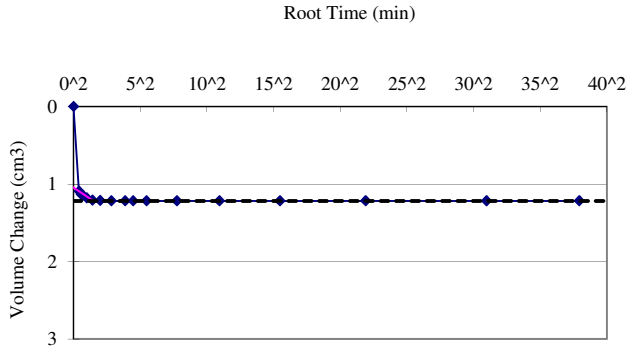
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: LD-12-1 Soil Type: Sand with Clay
Sample No.: D-3 Depth : 11.00-11.50m



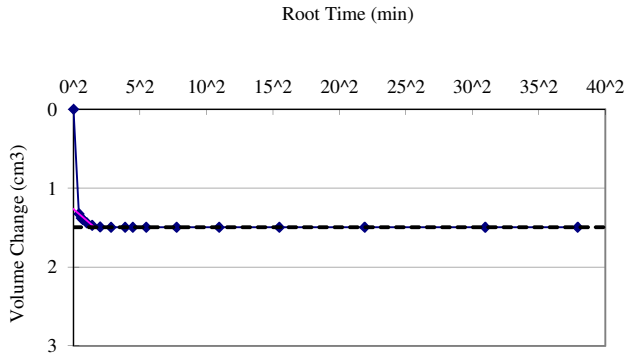
Specimen No.: 1

p' =	40	kPa
t100 =	1.9	min
Cv =	530	m^2/year
mvi=	0.032	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	2.2	min
Cv =	474	m^2/year
mvi=	0.012	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	2.5	min
Cv =	412	m^2/year
mvi=	0.012	m^2/MN

Summary of Consolidated Drained Triaxial Compression Test

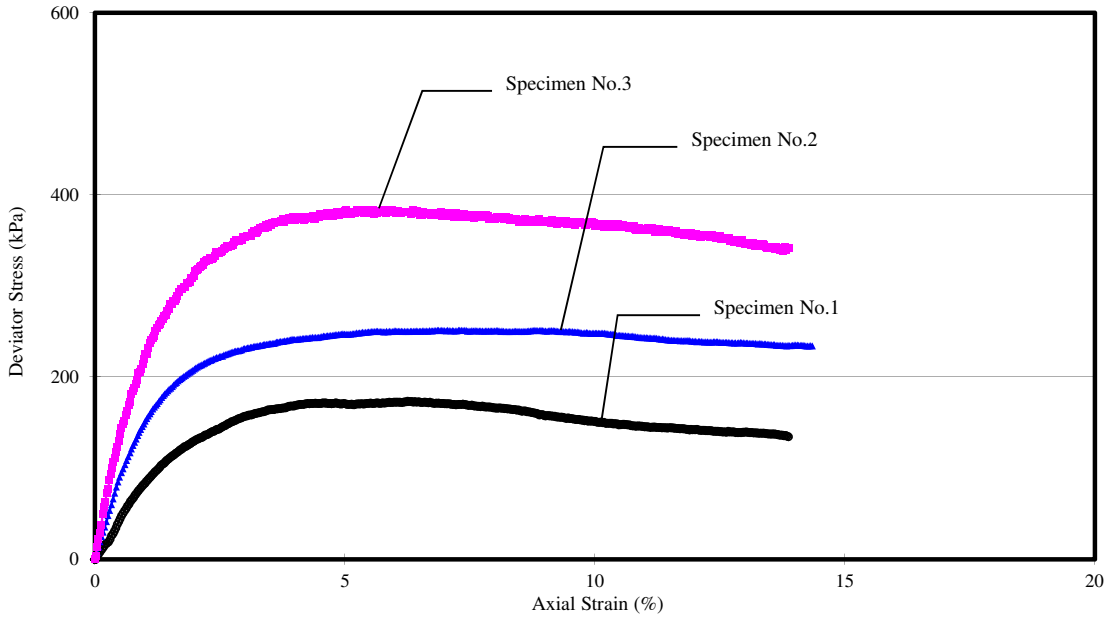
Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 10.12.14		Tested by : Perera		Checked by : A. B. Tan			
Borehole No.: LD-12-1		Sample No.:D-5		Depth : 17.00-17.60m			
Specimen Condition : Remoulded		Test Method : ASTM D7181-11					
Soil Description : Sand with Clay		Ave. Diameter : 50.0mm		Ave. Height : 100.0mm			
Specimen No.			1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.53	1.53	1.53		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	570	600		
	B-value		0.95	0.96	0.96		
Consolidation Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	528	558	586		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.04	0.10	0.17		
	Coefficient of Consolidation Cv,	m^2/year	497	399	336		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.011	0.015	0.017		
Compression Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	174	252	384		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-2.26	-1.56	-1.04		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	6.25	6.94	5.36		
Shear Strength Parameters	ϕ_d = 41 Degree c_d = 0 kPa		Mode of Failure				
			1	2	3	4	
Remarks : Specimens are prepared at 90% of Maximum dry density (from compaction Test) = 1.53Mg/m^3							

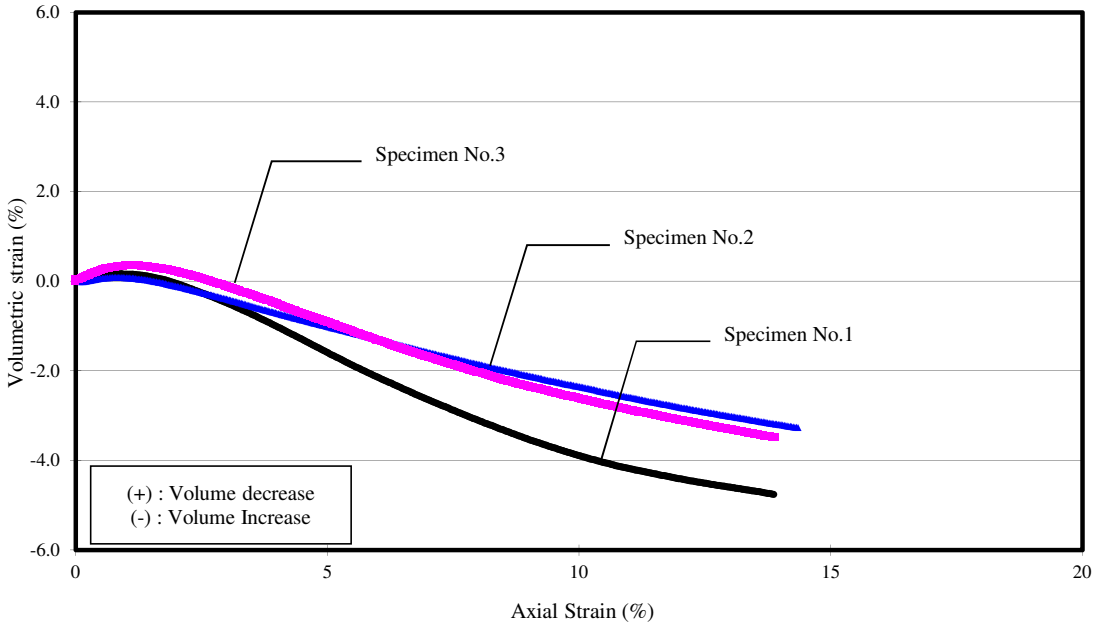
Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No.: S27-14 Sample No.: D-5 Soil Type: Sand with Clay

Borehole No.: LD-12-1 Depth : 17.00-17.60mm





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

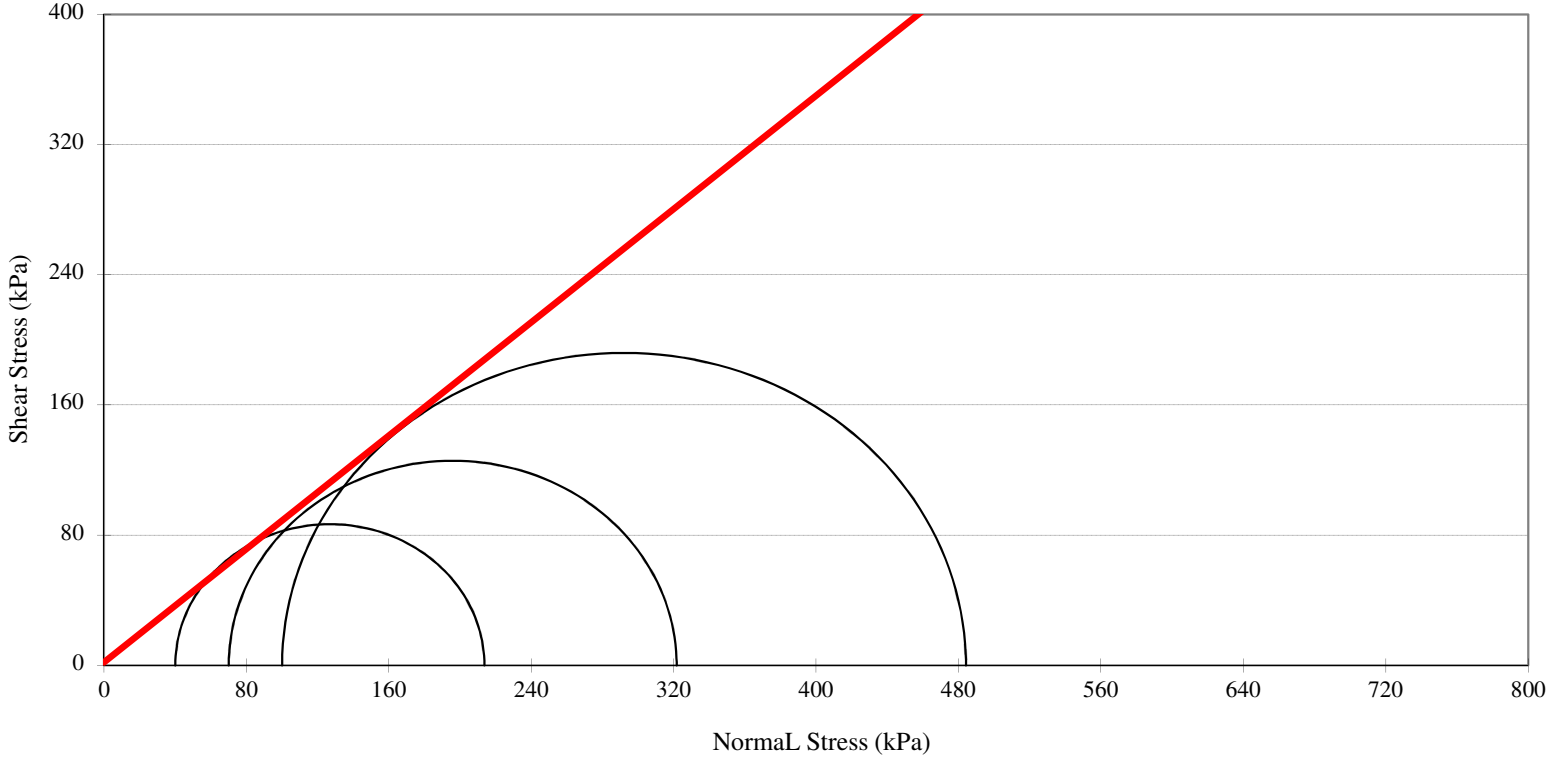
Project No. : S27-14

Borehole No. : LD-12-1 Soil Type: Sand with Clay

Sample No. : D-5 Depth : 17.00-17.60m

Angle of Internal Friction, ϕ_d 41 deg

Cohesion, c_d 0 kPa

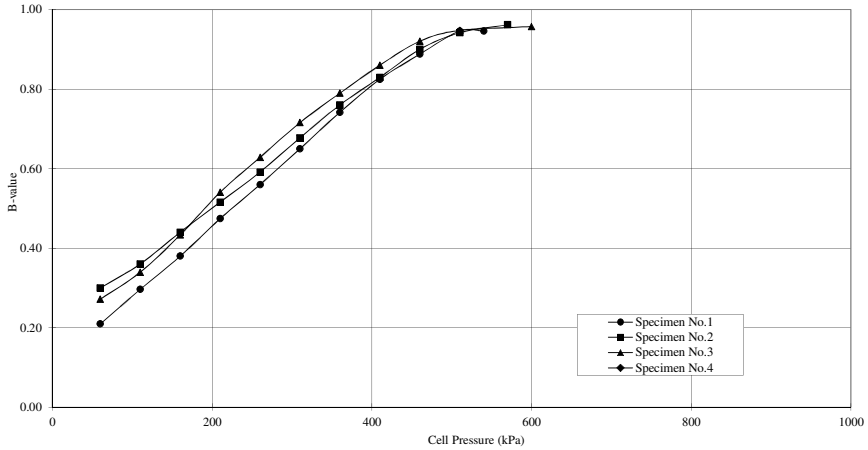


Kiso-Jiban Consultants Co., Ltd.

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: LD-12-1 Depth : 17.00-17.60m
Sample No.: D-5 Soil Type: Sand with Clay

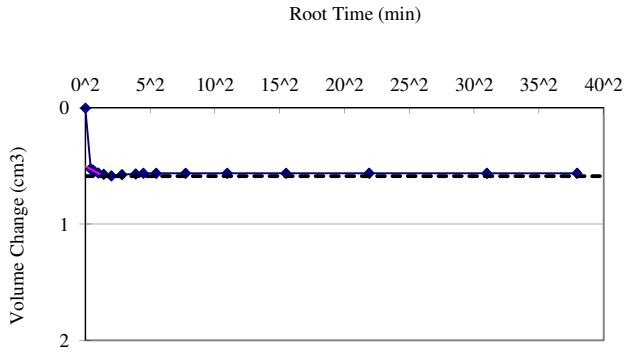
		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	26.3	20	29.0	20	28.1		
	Back Pressure (kPa)	20		20		20			
	B-value	0.21		0.30		0.27			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	64.8	50	68.0	50	67.0		
	Back Pressure (kPa)	50		50		50			
	B-value	0.30		0.36		0.34			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	119.0	100	122.0	100	121.7		
	Back Pressure (kPa)	100		100		100			
	B-value	0.38		0.44		0.43			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	173.7	150	175.8	150	177.0		
	Back Pressure (kPa)	150		150		150			
	B-value	0.47		0.52		0.54			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	228.0	200	229.6	200	231.4		
	Back Pressure (kPa)	200		200		200			
	B-value	0.56		0.59		0.63			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	282.5	250	283.9	250	285.8		
	Back Pressure (kPa)	250		250		250			
	B-value	0.65		0.68		0.72			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	337.1	300	338.0	300	339.5		
	Back Pressure (kPa)	300		300		300			
	B-value	0.74		0.76		0.79			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	391.2	350	391.5	350	393.0		
	Back Pressure (kPa)	350		350		350			
	B-value	0.82		0.83		0.86			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	444.4	400	445.0	400	446.0		
	Back Pressure (kPa)	400		400		400			
	B-value	0.89		0.90		0.92			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	497.3	450	497.1	450	497.4		
	Back Pressure (kPa)	450		450		450			
	B-value	0.95		0.94		0.95			
B-check Step.11	Cell Pressure (kPa)	510	540	510	570	510	600		
	P.W.P (kPa)	500	528.4	500	557.7	500	586.2		
	Back Pressure (kPa)	500		500		500			
	B-value	0.95		0.96		0.96			



192

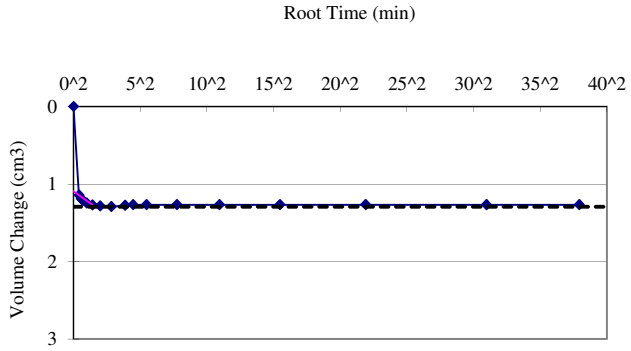
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: LD-12-1 Soil Type: Sand with Clay
Sample No.: D-5 Depth : 17.00-17.60m



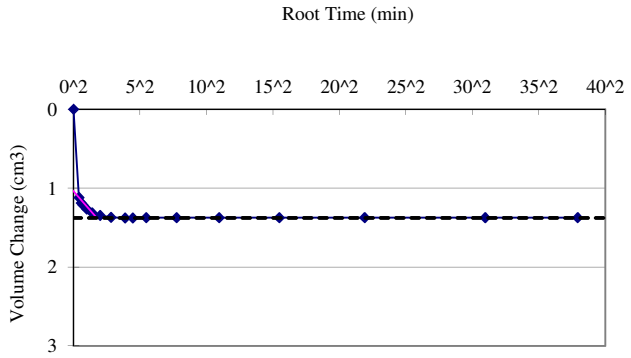
Specimen No.: 1

p' =	40	kPa
t100 =	2.1	min
Cv =	497	m^2/year
mvi=	0.011	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	2.6	min
Cv =	399	m^2/year
mvi=	0.015	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	3.1	min
Cv =	336	m^2/year
mvi=	0.017	m^2/MN

RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

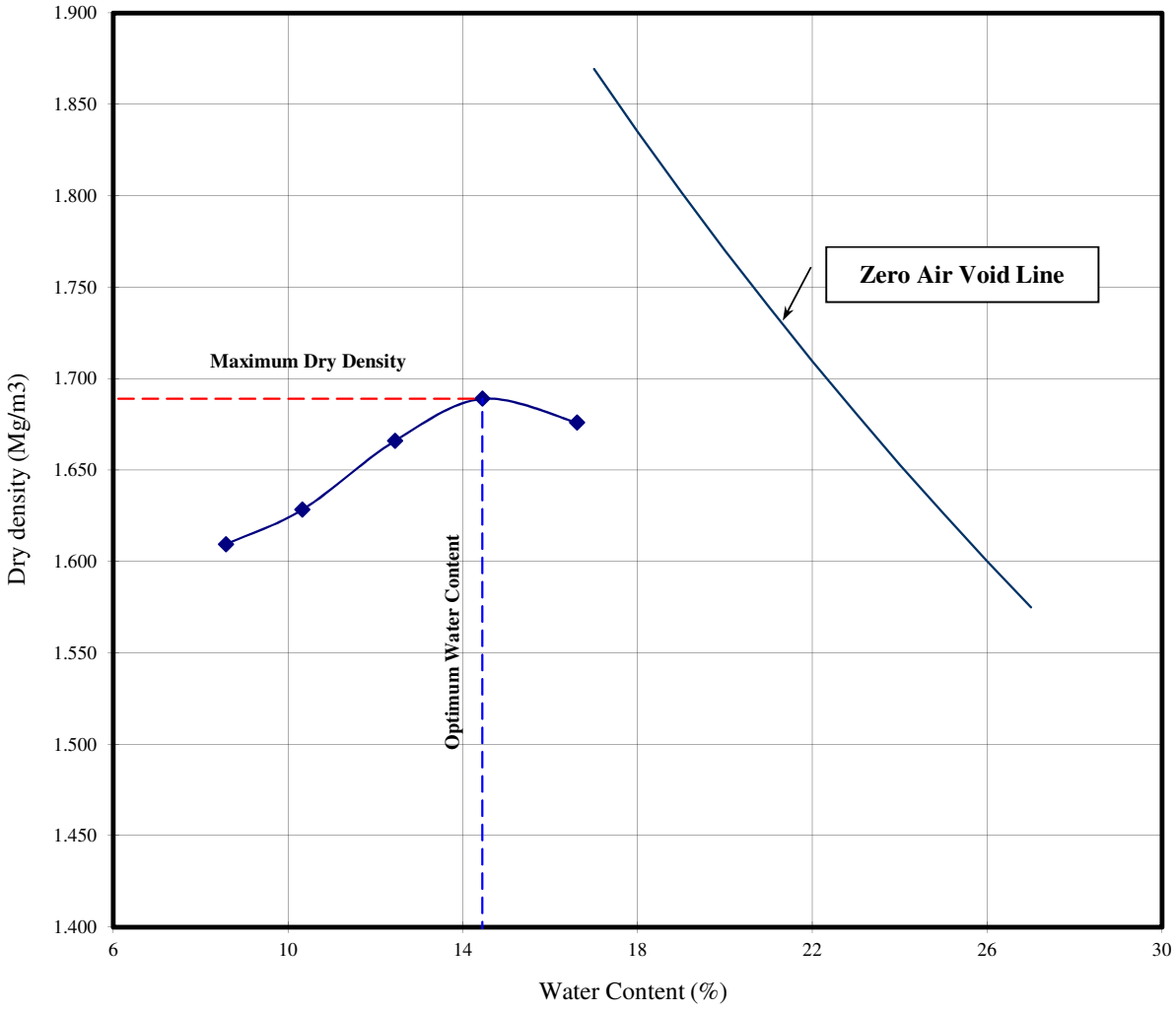
Sampling Date : - **Date of Testing :** 5-Dec-14 **Tested by :** Perera/Bala

Sample No. : LD-12-1 D-1(5.00-5.80m) **Ref. No.** -

Soil Type :	Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.74	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	8.6	10.3	12.4	14.4	16.6			
Wet Density (Mg/m3)	1.748	1.797	1.873	1.933	1.954			
Dry Density (Mg/m3)	1.609	1.628	1.666	1.689	1.676			

Maximum Dry Density	**1.689 Mg/m3**
Optimum Water Content	**14.4 %**



194

RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

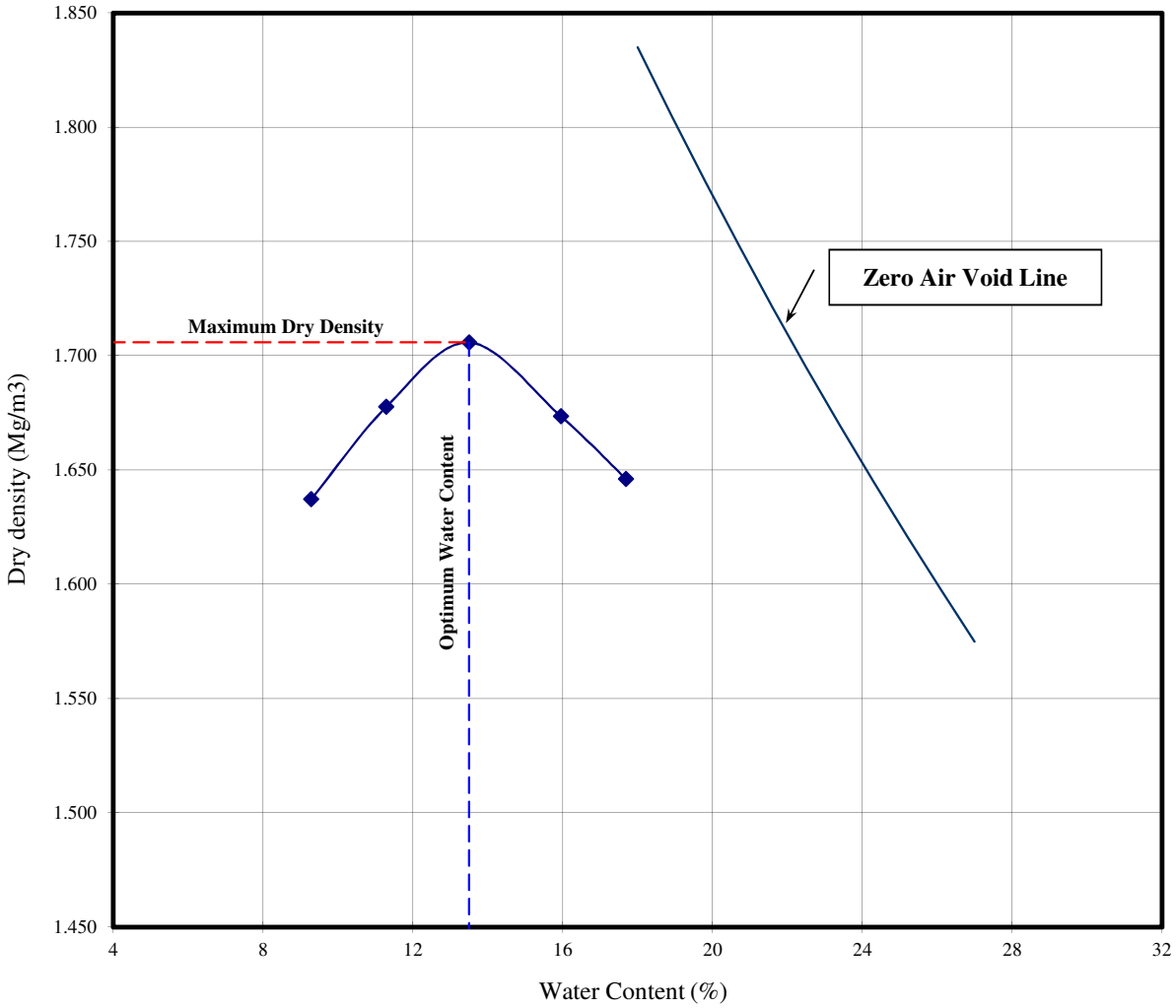
Sampling Date : - **Date of Testing :** 5-Dec-14 **Tested by :** Perera/Bala

Sample No. : LD-12-1 D-3(11.00-11.50m) **Ref. No.** -

Soil Type :	Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.74	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	9.3	11.3	13.5	16.0	17.7			
Wet Density (Mg/m3)	1.789	1.867	1.936	1.940	1.937			
Dry Density (Mg/m3)	1.637	1.678	1.706	1.673	1.646			

Maximum Dry Density	**1.706 Mg/m3**
Optimum Water Content	**13.5 %**



195

RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

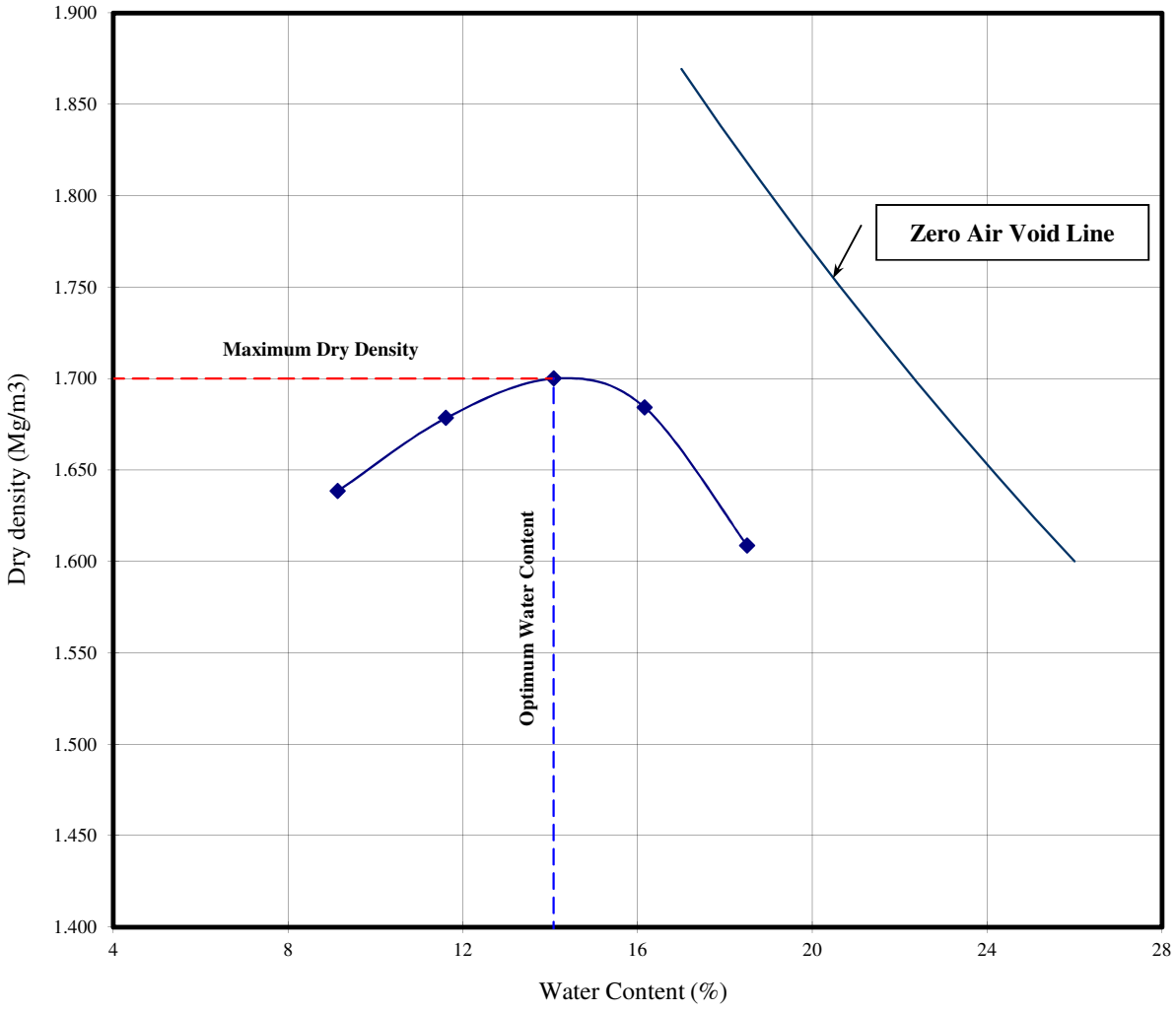
Sampling Date : - **Date of Testing :** 6-Dec-14 **Tested by :** Perera/Bala

Sample No. : LD-12-1 D-5(17.00-17.60m) **Ref. No.** -

Soil Type :	Silty Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.74	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	9.1	11.6	14.1	16.2	18.5			
Wet Density (Mg/m3)	1.788	1.873	1.939	1.956	1.906			
Dry Density (Mg/m3)	1.638	1.678	1.700	1.684	1.609			

Maximum Dry Density	**1.700 Mg/m3**
Optimum Water Content	**14.1 %**



196

17) LD2-10a-1

197

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			LD2-10a-1								
Sample No.			HP-1	HP-2	D-1	D-2	D-3	D-4			
Sample Depth			2.00m ~2.85m	5.00m ~5.90m	8.00m ~8.85m	11.00m ~11.80m	16.00m ~16.90m	19.00m ~19.80m			
Condition of Sample			Undisturbed		Undisturbed						
Natural Water Content		%	36.9	27.0	26.7	22.9	29.5	26.9			
Specific Gravity			2.72	2.71	2.71	2.68	2.71	2.70			
Wet Density		Mg/m^3	1.84	1.95	1.94	2.00	1.90	1.97			
Dry Density		Mg/m^3	1.34	1.53	-	-	-	-			
Natural Void Ratio			1.03	0.77	-	-	-	-			
Degree of Saturation		%	98	95	-	-	-	-			
Atterberg Limits	Liquid Limit,	%	39	- *3	- *3	- *3	33	- *3			
	Plastic Limit,	%	22	- *3	- *3	- *3	20	- *3			
	Plasticity Index,	%	17	- *3	- *3	- *3	13	- *3			
Grain Size Analysis	Gravel,	%	0	0	0	0	0	0			
	Sand,	%	12	24	38	81	14	33			
	Silt,	%	53	51	38	7	50	43			
	Clay & Colloid,	%	35	25	24	12	36	24			
	Max. diameter,	mm	0.850	0.850	0.850	2.00	0.850	0.850			
	Diam. at 60%	mm	0.020	0.047	0.072	0.24	0.017	0.060			
	Diam. at 10%	mm	-	-	-	0.0014	-	-			
Visual soil description			Clay	Clay with Sand	Sandy Clay	Clayey Sand	Clay	Sandy Clay			
Unified soil classification			CL	-	-	-	CL	-			
Triaxial compression test	Angle of Internal Friction	(^{0})	-	-	-	-	-	-			
	Cohesion Intercept, kPa		-	-	-	-	-	-			
	Condition of drainage		-	-	-	-	-	-			
	Angle of Internal Friction *2	(^{0})	-	-	-	-	-	-			
	Cohesion Intercept, kPa *2		-	-	-	-	-	-			
	Condition of drainage		-	-	-	-	-	-			
Consolidation Test	Preconsolidation Pressure,	kPa	-	-	-	-	-	-			
	Compression Index(Average)		-	-	-	-	-	-			
	Pressure Range for Compression Index(kPa)		-	-	-	-	-	-			
	Swell index		-	-	-	-	-	-			
Chemical Test	pH value		-	-	-	-	-	-			
	Total sulphate content as SO_3,	%	-	-	-	-	-	-			
	Chloride content as Cl,	%	-	-	-	-	-	-			
	Organic Matter content,	%	-	-	-	-	-	-			
Unconfined Compression Strength (kPa)			-	-	-	-	-	-			
Strain at failure (%)			-	-	-	-	-	-			

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No. : S27-14

Standard : ASTM D4318-10

Date of Testing : 11.10.14

Tested By : Vasantha

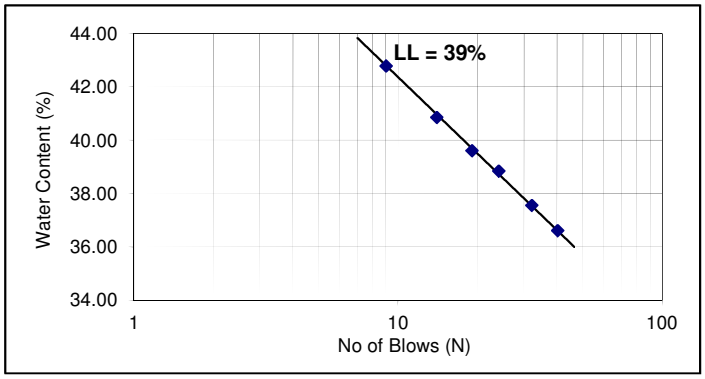
Checked By : A. B. Tan

Sample No. : LD2-10a-1 HP-1

Depth : 2.00-2.85m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	40	36.61
2	32	37.56
3	24	38.84
4	19	39.60
5	14	40.85
6	9	42.78
Liquid Limits %		**39**
Plastic Limits %		**22**
Plasticity Index		**17**

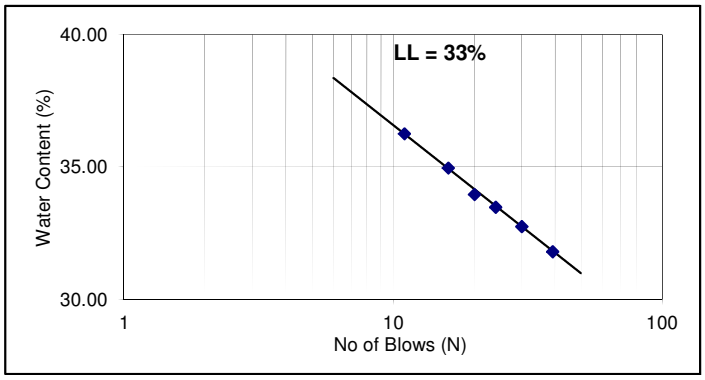


Sample No. : LD2-10a-1 D-3

Depth : 16.00-16.90m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	39	31.80
2	30	32.76
3	24	33.48
4	20	33.96
5	16	34.96
6	11	36.26
Liquid Limits %		**33**
Plastic Limits %		**20**
Plasticity Index		**13**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **09.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

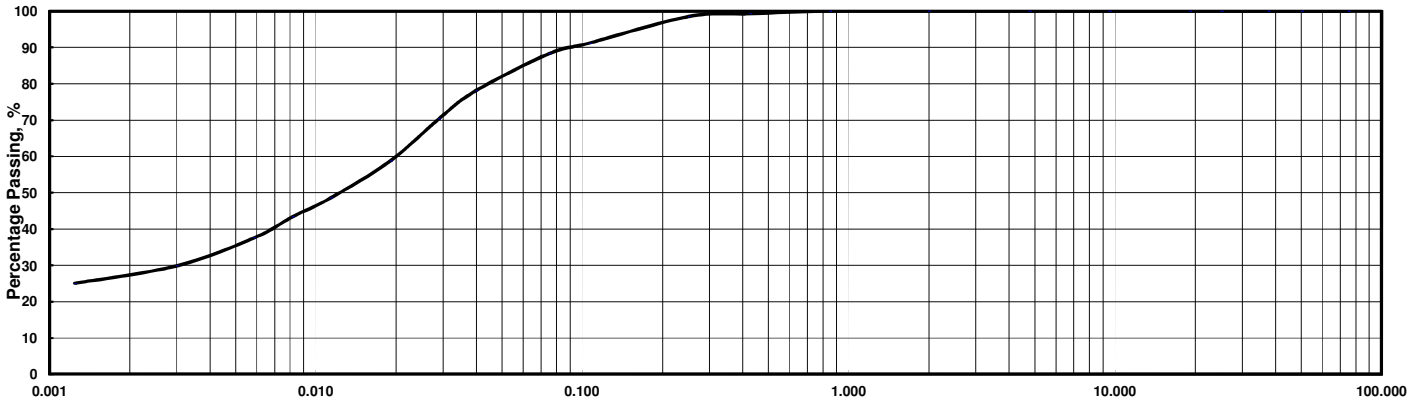
Sample No. : **LD2-10a-1 HP-1** Depth : **2.00-2.85m** (_____) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3	98.5	91.2	88.3
Hydro.	Dia., mm	0.040	0.029	0.019	0.011	0.0082	0.0059	0.0030	0.0012							
	% Passing	78.1	70.4	58.8	48.6	43.4	37.6	29.9	25.1							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-10a-1 HP-1 2.00-2.85m			Sample No. Depth	LD2-10a-1 HP-1 2.00-2.85m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.020	mm
2.00 - 0.425 mm	0.7	%		Dia. at 30%	0.0030	mm
0.425 - 0.075 mm	11.0	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	53.1	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	35.3	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	88.3	%				

Kiso-Jiban Consultants Co., Ltd.

200

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **09.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

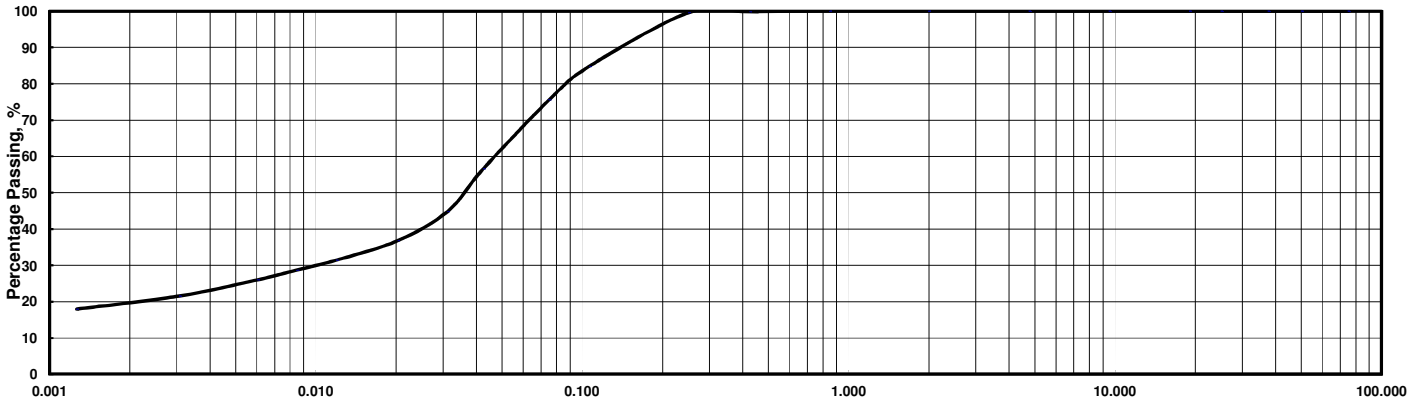
Sample No. : **LD2-10a-1 HP-2** Depth : **5.00-5.90m** (_____) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.5	84.8	75.6
Hydro.	Dia., mm	0.042	0.031	0.020	0.012	0.0085	0.0061	0.0031	0.0013							
	% Passing	56.6	44.9	36.8	31.4	28.7	26.1	21.6	18.0							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-10a-1 HP-2 5.00-5.90m			Sample No. Depth	LD2-10a-1 HP-2 5.00-5.90m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.047	mm
2.00 - 0.425 mm	0.2	%		Dia. at 30%	0.010	mm
0.425 - 0.075 mm	24.2	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	51.1	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	24.5	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	75.6	%				

Kiso-Jiban Consultants Co., Ltd.

201

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **09.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

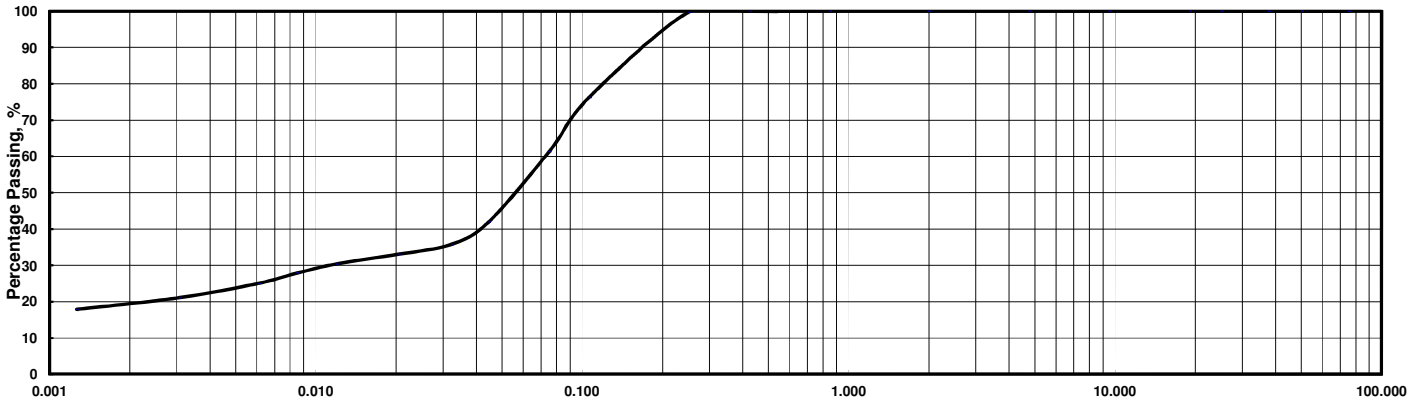
Sample No. : **LD2-10a-1 D-1** Depth : **8.00-8.85m** (_____) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.7	76.3	61.3
Hydro.	Dia., mm	0.045	0.032	0.021	0.012	0.0085	0.0061	0.0031	0.0013							
	% Passing	42.0	35.8	33.1	30.4	27.9	25.0	21.1	17.9							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-10a-1 D-1 8.00-8.85m			Sample No. Depth	LD2-10a-1 D-1 8.00-8.85m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.072	mm
2.00 - 0.425 mm	0.1	%		Dia. at 30%	0.011	mm
0.425 - 0.075 mm	38.5	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	37.7	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	23.6	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	61.3	%				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **09.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

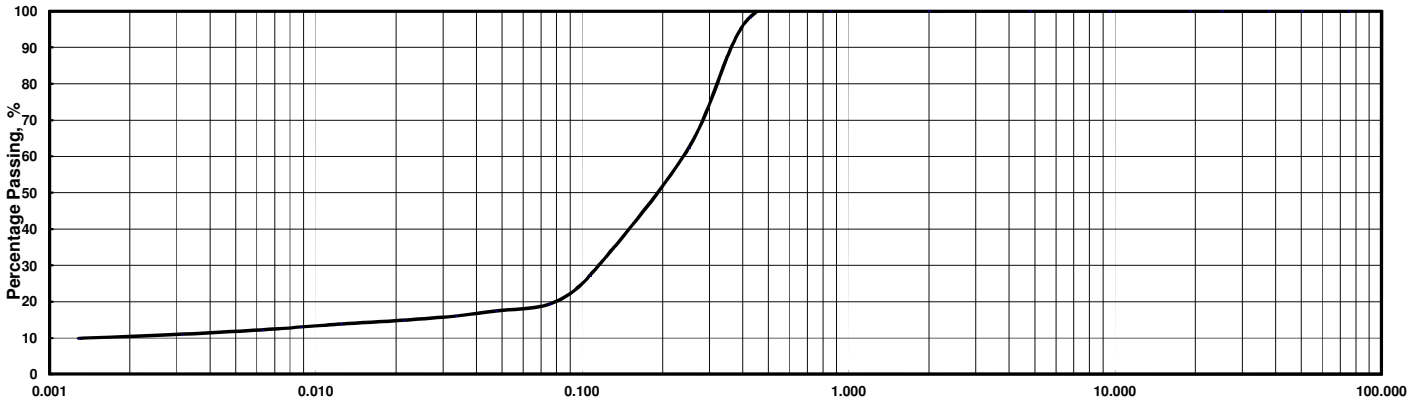
Sample No. : **LD2-10a-1 D-2** Depth : **11.00-11.80m** ( ) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	98.3	62.2	27.0	19.3
Hydro.	Dia., mm	0.047	0.034	0.021	0.012	0.0088	0.0062	0.0031	0.0013							
	% Passing	17.5	16.1	14.9	13.8	13.0	12.2	11.1	9.9							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-10a-1 D-2 11.00-11.80m			Sample No. Depth	LD2-10a-1 D-2 11.00-11.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.24	mm
2.00 - 0.425 mm	1.7	%		Dia. at 30%	0.11	mm
0.425 - 0.075 mm	79.0	%		Dia. at 10%	0.0014	mm
0.075 - 0.005 mm	7.6	%		Coeff. of Uniformity	169	
Smaller than 0.005 mm	11.8	%		Coeff. of Curvature	39.2	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.9	%				
75um Sieve Passing	19.3	%				

Kiso-Jiban Consultants Co., Ltd.

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **09.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

Sample No. : **LD2-10a-1 D-3** Depth : **16.00-16.90m** (_____) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	95.5	88.4	85.6
Hydro.	Dia., mm	0.039	0.028	0.019	0.011	0.0082	0.0059	0.0030	0.0012							
	% Passing	78.6	72.2	62.1	49.3	42.0	37.5	31.4	27.4							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-10a-1 D-3 16.00-16.90m		Sample No. Depth	LD2-10a-1 D-3 16.00-16.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.017 mm	
2.00 - 0.425 mm	0.8 %		Dia. at 30%	0.0022 mm	
0.425 - 0.075 mm	13.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	49.9 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	35.7 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	85.6 %				

Kiso-Jiban Consultants Co., Ltd.

204

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : _____ Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **09.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

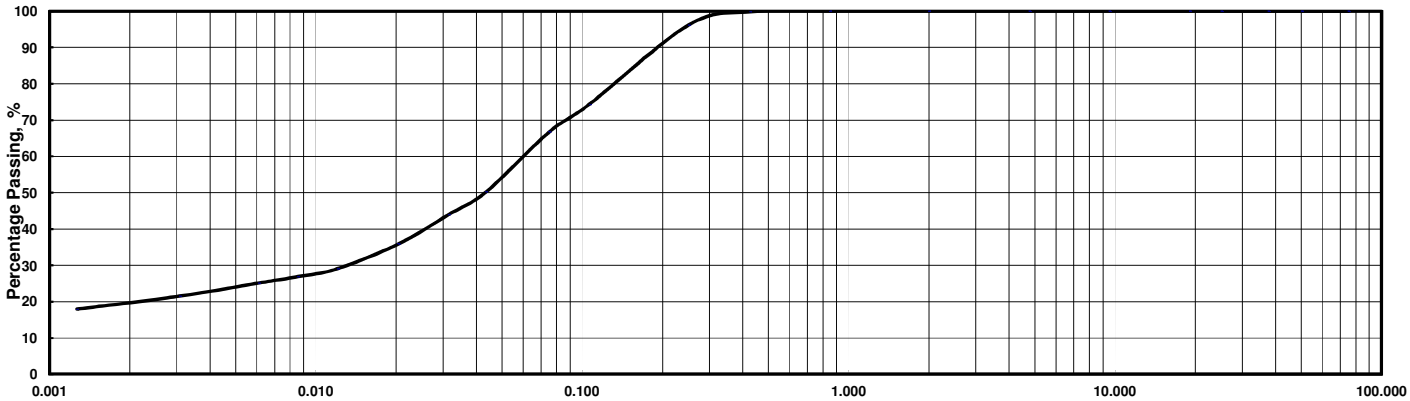
Sample No. : **LD2-10a-1 D-4** Depth : **19.00-19.80m** (_____) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	96.1	74.3	66.7
Hydro.	Dia., mm	0.043	0.031	0.020	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	50.2	44.0	35.9	29.1	26.9	25.1	21.5	17.9							

Sample No. : Depth : (----------) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	LD2-10a-1 D-4 19.00-19.80m		Sample No. Depth	LD2-10a-1 D-4 19.00-19.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.060 mm	
2.00 - 0.425 mm	0.2 %		Dia. at 30%	0.013 mm	
0.425 - 0.075 mm	33.1 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	42.9 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	23.8 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	66.7 %				

Kiso-Jiban Consultants Co., Ltd.

18) LD2-11-1

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.		LD2-11-1								
Sample No.		HP-1	HP-2	HP-3	HP-4	D-1	D-2	D-3		
Sample Depth		2.00m ~2.80m	5.00m ~5.90m	8.00m ~8.90m	11.00m ~11.80m	14.00m ~14.80m	17.00m ~17.80m	20.00m ~20.80m		
Condition of Sample		Undisturbed				Disturbed				
Natural Water Content	%	55.6	31.5	47.0	29.9	23.0	31.0	20.8		
Specific Gravity		2.72	2.71	2.74	2.71	2.68	2.72	2.69		
Wet Density	Mg/m^3	1.68	1.91	1.76	1.94	1.84	1.83	1.90		
Dry Density	Mg/m^3	1.08	1.45	1.20	1.49	1.49	1.40	1.57		
Natural Void Ratio		1.52	0.87	1.29	0.82	0.79	0.94	0.71		
Degree of Saturation	%	100	99	100	99	78	89	79		
Atterberg Limits	Liquid Limit, %	62	- *3	44	- *3	- *3	- *3	- *3		
	Plastic Limit, %	31	- *3	24	- *3	- *3	- *3	- *3		
	Plasticity Index, %	31	- *3	20	- *3	- *3	- *3	- *3		
Grain Size Analysis	Gravel, %	0	0	0	0	0	0	0		
	Sand, %	4	42	12	38	85	42	82		
	Silt, %	48	33	43	33	15	35	18		
	Clay & Colloid, %	48	25	45	29		23			
	Max. diameter, mm	2.00	0.425	0.850	2.00	9.50	0.425	4.75		
	Diam. at 60% mm	0.011	0.077	0.013	0.066	0.19	0.078	0.33		
	Diam. at 10% mm	-	-	-	-	-	-	-		
Visual soil description		Clay	Sandy Silt	Clay	Sandy Silt	Silty Sand	Sandy Silt	Silty Sand		
Unified soil classification		CH	-	CL	-	-	-	-		
Triaxial compression test	Angle of Internal Friction (°)	0	0	0	-	-	-	-		
	Cohesion Intercept, kPa	14	62	25	-	-	-	-		
	Condition of drainage	UU	UU	UU	-	-	-	-		
	Angle of Internal Friction *2 (°)	-	37	-	-	35	-	-		
	Cohesion Intercept, kPa *2	-	4	-	-	0	-	-		
	Condition of drainage	-	$\overline{CU}$	-	-	CD*6	-	-		
Consolidation Test	Preconsolidation Pressure, kPa	68	450	190 *4	-	-	-	-		
	Compression Index(Average)	0.46	0.22	0.22 *4	-	-	-	-		
	Pressure Range for Compression Index(kPa)	200-1600	1600-3200	800-3200	-	-	-	-		
	Swell index	0.11	0.032	0.054 *4	-	-	-	-		
Compaction Test *5	Maximum Dry Density, Mg/m^3	-	-	-	-	1.84	-	-		
	Optimum Moisture Content , %	-	-	-	-	14.4	-	-		
Unconfined Compression Strength (kPa)		-	-	-	-	-	-	-		
Strain at failure (%)		-	-	-	-	-	-	-		

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

*4 : Specimen tested has higher density and lower water content(more sand content) *5 : By using 2.5 kg Rammer

*6 : Specimens are prepared at 90% at Maximum dry density

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

TABLE SUMMARY OF SOIL TEST (Site Laboratory)

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			**LD2-11-1**							
Sample No.			SPT-6	SPT-7	SPT-8	SPT-9	D-1	SPT-10	SPT-11	SPT-12
Sample Depth			9.00m ~9.45m	10.00m ~10.45m	12.00m ~12.45m	13.00m ~13.45m	14.00m ~14.80m	15.00m ~15.45m	16.00 ~16.45m	18.00m ~18.45m
Condition of Sample			Disturbed							
Atterberg Limits	Liquid Limit,	%	-	-	-	-	-	-	-	-
	Plastic Limit,	%	-	-	-	-	-	-	-	-
	Plasticity Index,	%	-	-	-	-	-	-	-	-
Grain Size Analysis	Gravel,	%	0	0	0	0	1	0	0	0
	Sand,	%	89	45	92	13	85	91	80	67
	Silt,	%	11	55	8	87	14	9	20	33
	Clay & Colloid,	%								
	Max. diameter,	mm	2.00	2.00	2.00	4.75	9.5	9.50	4.75	4.75
	Diam. at 60%	mm	0.24	0.11	0.24	-	0.12	0.29	0.13	0.10
	Diam. at 10%	mm	-	-	0.0900	-	-	0.078	-	-
Visual soil description			Silty Sand	Sandy Silt	Silty Sand	Sandy Silt	Silty Sand	Silty Sand	Silty Sand	Silty Sand
Unified soil classification			-	-	-	-	-	-		-

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3: Unable to test because samples contain lots of sand

Checked by :

Kiso-Jiban Consultants Co., Ltd.

209

TABLE SUMMARY OF SOIL TEST (Site Laboratory)

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			**LD2-11-1**							
Sample No.			SPT-13	SPT-17	SPT-18	SPT-19	SPT-20	SPT-21	SPT-22	SPT-23
Sample Depth			19.00m ~19.45m	24.00 ~24.45m	25.00 ~25.45m	26.00m ~26.45m	27.00m ~27.45m	28.00m ~28.45m	29.00m ~29.45m	18.00m ~18.45m
Condition of Sample			Disturbed							
Atterberg Limits	Liquid Limit,	%	-	-	-	-	-	-	-	-
	Plastic Limit,	%	-	-	-	-	-	-	-	-
	Plasticity Index,	%	-	-	-	-	-	-	-	-
Grain Size Analysis	Gravel,	%	0	0	0	0	0	0	0	0
	Sand,	%	61	75	54	26	45	79	79	75
	Silt,	%	39	25	46	74	55	21	21	25
	Clay & Colloid,	%								
	Max. diameter,	mm	4.75	9.50	4.75	4.75	4.75	2.00	2.00	4.75
	Diam. at 60%	mm	0.14	0.24	0.26	-	0.09	0.18	0.19	0.18
	Diam. at 10%	mm	-	-	-	-	-	-	-	-
Visual soil description			Silty Sand	Silty Sand	Silty Sand	Sandy Silt	Sandy Silt	Silty Sand	Silty Sand	Silty Sand
Unified soil classification			-	-	-	-	-	-	-	-

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3: Unable to test because samples contain lots of sand

Checked by :

Kiso-Jiban Consultants Co., Ltd.

210

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No. : S27-14

Standard : ASTM D4318-10

Date of Testing : 20.10.14

Tested By : Vasantha

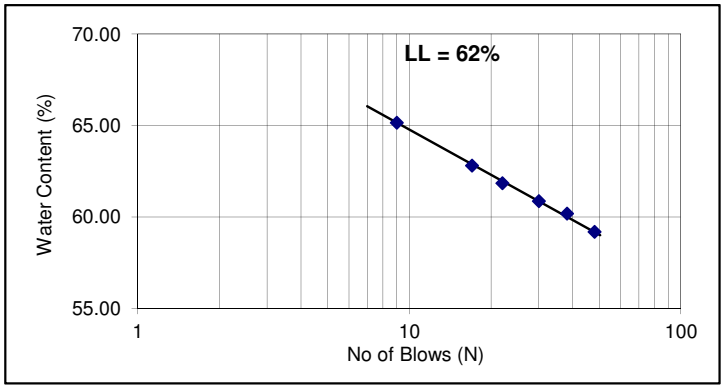
Checked By : A. B. Tan

Sample No. : LD2-11-1 HP-1

Depth : 2.00-2.80m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	48	59.18
2	38	60.17
3	30	60.86
4	22	61.84
5	17	62.79
6	9	65.15
Liquid Limits %		**62**
Plastic Limits %		**31**
Plasticity Index		**31**

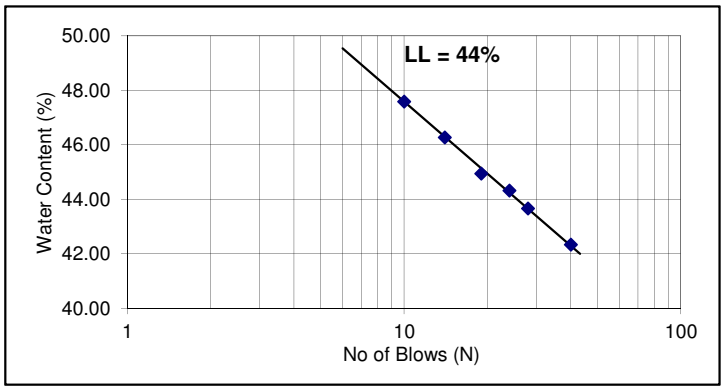


Sample No. : LD2-11-1 HP-3

Depth : 8.00-8.90m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	40	42.33
2	28	43.65
3	24	44.31
4	19	44.94
5	14	46.26
6	10	47.58
Liquid Limits %		**44**
Plastic Limits %		**24**
Plasticity Index		**20**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

211

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **16.10.14** Tested By : **Htet Paing/Shariful** Checked by : **A. B. Tan**

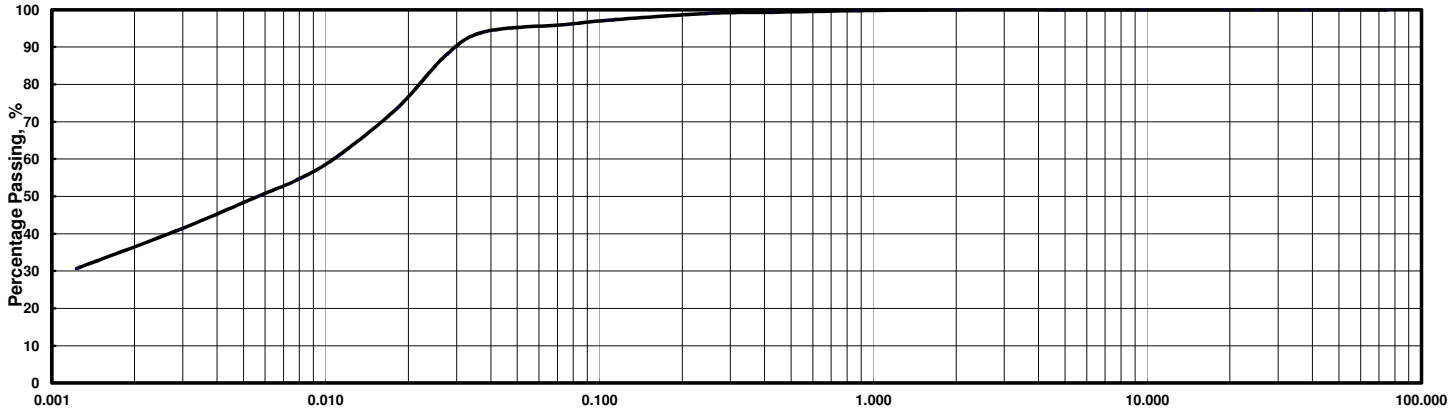
Sample No. : **LD2-11-1 HP-1** Depth : **2.00-2.80m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	99.3	99.0	97.2	96.0
Hydro.	Dia., mm	0.038	0.028	0.018	0.011	0.0080	0.0057	0.0029	0.0012							
	% Passing	94.1	88.0	73.9	60.8	54.6	50.1	41.1	30.7							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1 HP-1 2.00-2.80m			Sample No. Depth	LD2-11-1 HP-1 2.00-2.80m		
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.011	mm	
2.00 - 0.425 mm	0.7	%		Dia. at 30%	-	mm	
0.425 - 0.075 mm	3.3	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	48.2	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	47.8	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.7	%					
75um Sieve Passing	96.0	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **16.10.14** Tested By : **Htet Paing/Shariful** Checked by : **A. B. Tan**

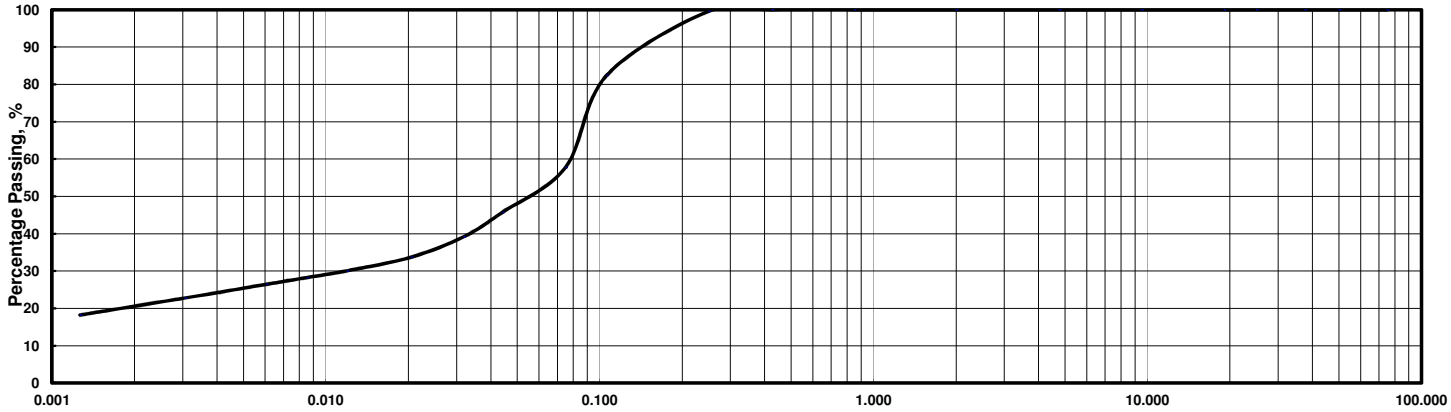
Sample No. : **LD2-11-1 HP-2** Depth : **5.00-5.90m** ( ) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	82.4	57.8
Hydro.	Dia., mm	0.044	0.032	0.021	0.012	0.0085	0.0061	0.0031	0.0013							
	% Passing	45.8	39.2	33.7	30.1	28.3	26.4	22.8	18.2							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1 HP-2 5.00-5.90m			Sample No. Depth	LD2-11-1 HP-2 5.00-5.90m		
Larger than 4.75 mm	0.0	%		Max. Diameter	0.425	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.077	mm	
2.00 - 0.425 mm	0.0	%		Dia. at 30%	0.012	mm	
0.425 - 0.075 mm	42.2	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	32.6	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	25.2	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	100.0	%					
75um Sieve Passing	57.8	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422** Date of Testing : **17.10.14** Tested By : **Htet Paing/Motiur** Checked by : **A. B. Tan**

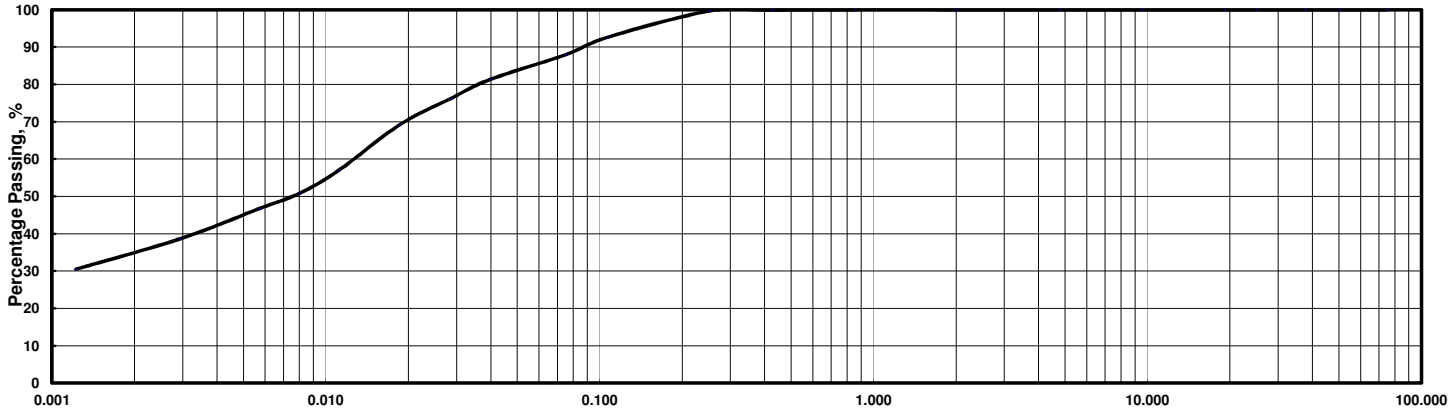
Sample No. : **LD2-11-1 HP-3** Depth : **8.00-8.90m** ( ) Specific Gravity : 2.74

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.6	92.5	87.9
Hydro.	Dia., mm	0.040	0.029	0.019	0.011	0.0080	0.0057	0.0029	0.0012							
	% Passing	81.3	76.2	69.1	56.9	50.8	46.7	38.6	30.5							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1 HP-3 8.00-8.80m		Sample No. Depth	LD2-11-1 HP-3 8.00-8.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.013 mm	
2.00 - 0.425 mm	0.1 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	11.9 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	43.3 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	44.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	87.9 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **20.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

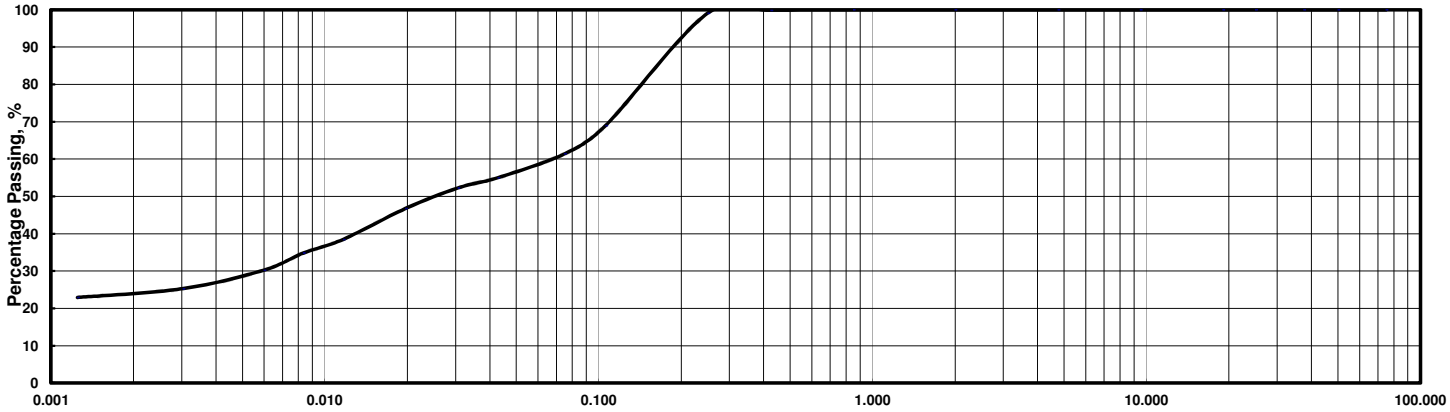
Sample No. : **LD2-11-1 HP-4** Depth : **11.00-11.80m** ( ) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.1	69.0	61.4
Hydro.	Dia., mm	0.043	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0012							
	% Passing	55.0	52.3	46.8	38.5	34.8	30.3	25.3	22.9							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1 HP-4 11.00-11.80m		Sample No. Depth	LD2-11-1 HP-4 11.00-11.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.066 mm	
2.00 - 0.425 mm	0.2 %		Dia. at 30%	0.0058 mm	
0.425 - 0.075 mm	38.4 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	32.8 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	28.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	61.4 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **18.11.14** Tested By : **Motiur** Checked by : **A. B. Tan**

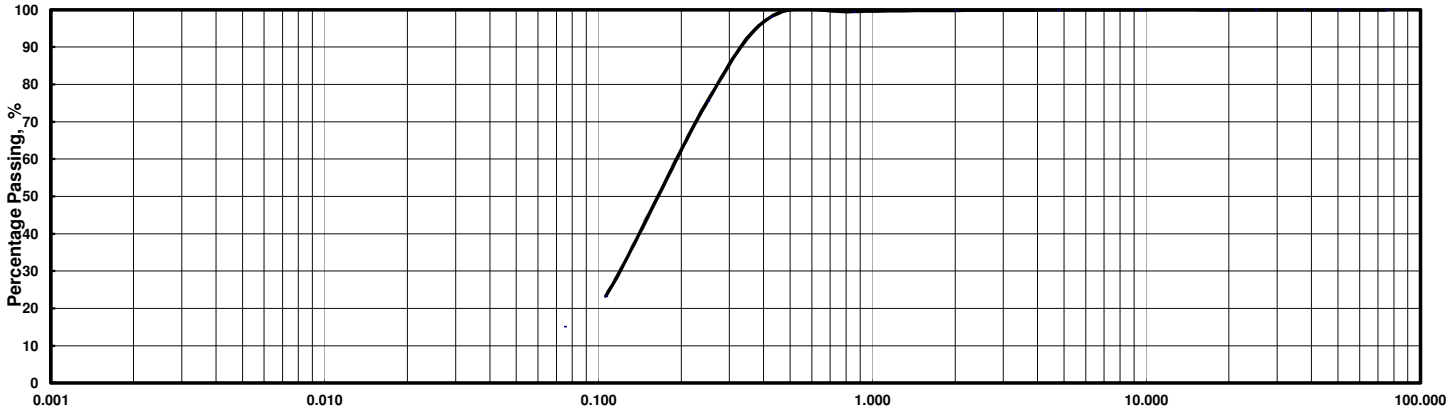
Sample No. : **LD2-11-1 D-1** Depth : **14.00-14.80m** ( ) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.8	99.5	98.1	75.6	23.3	15.2
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1 D-1 14.00-14.80m		Sample No. Depth	LD2-11-1 D-1 14.00-14.80m	
Larger than 4.75 mm	0.1 %		Max. Diameter	9.50 mm	
4.75 - 2.00 mm	0.1 %		Dia. at 60%	0.19 mm	
2.00 - 0.425 mm	1.7 %		Dia. at 30%	0.12 mm	
0.425 - 0.075 mm	82.9 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	15.2 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm			Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.5 %				
75um Sieve Passing	15.2 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **20.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

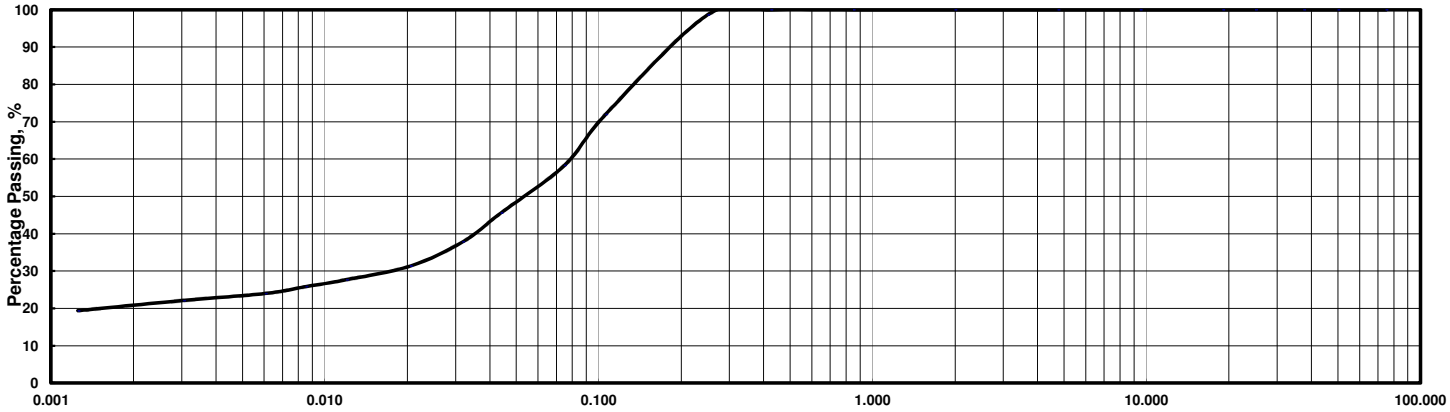
Sample No. : **LD2-11-1 D-2** Depth : **17.00-17.80m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.7	72.0	58.3
Hydro.	Dia., mm	0.044	0.032	0.021	0.012	0.0085	0.0061	0.0030	0.0013							
	% Passing	45.6	37.8	31.4	27.7	25.8	24.0	22.1	19.4							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1 D-2 17.00-17.80m			Sample No. Depth	LD2-11-1 D-2 17.00-17.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.425	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.078	mm
2.00 - 0.425 mm	0.0	%		Dia. at 30%	0.017	mm
0.425 - 0.075 mm	41.7	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	35.0	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	23.3	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	58.3	%				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **18.11.14** Tested By : **Motiur** Checked by : **A. B. Tan**

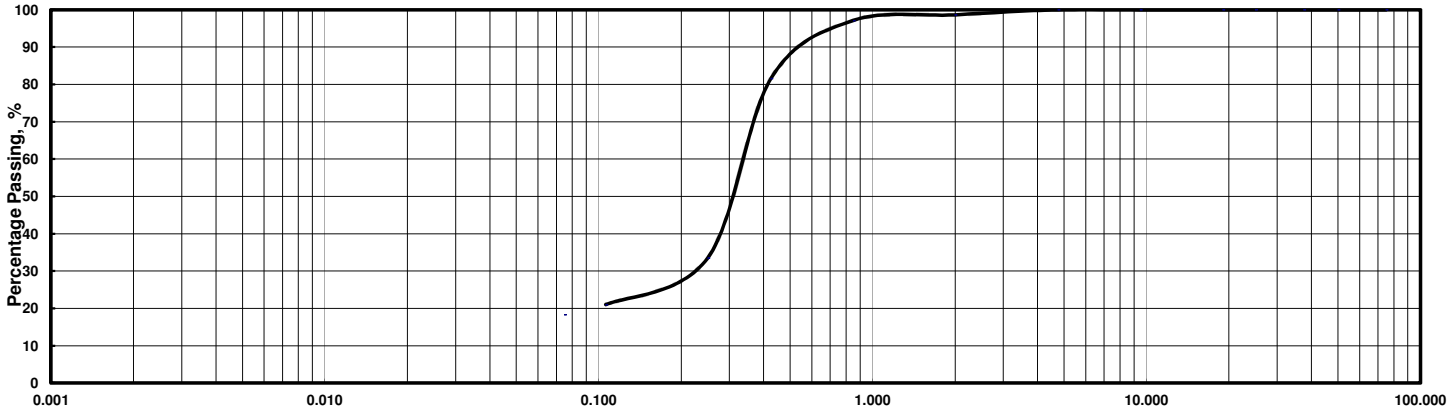
Sample No. : **LD2-11-1 D-3** Depth : **20.00-20.80m** ( ) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.6	97.1	81.5	33.5	21.0	18.4
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

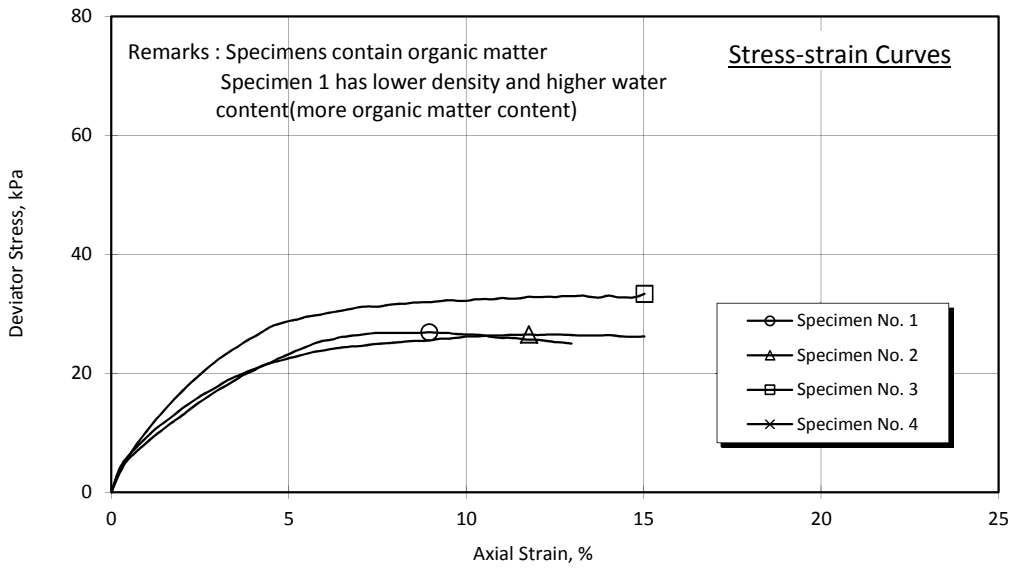
0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1 D-3 20.00-20.80m		Sample No. Depth	LD2-11-1 D-3 20.00-20.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	1.4 %		Dia. at 60%	0.33 mm	
2.00 - 0.425 mm	17.1 %		Dia. at 30%	0.20 mm	
0.425 - 0.075 mm	63.2 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	18.4 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm			Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	97.1 %				
75um Sieve Passing	18.4 %				

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

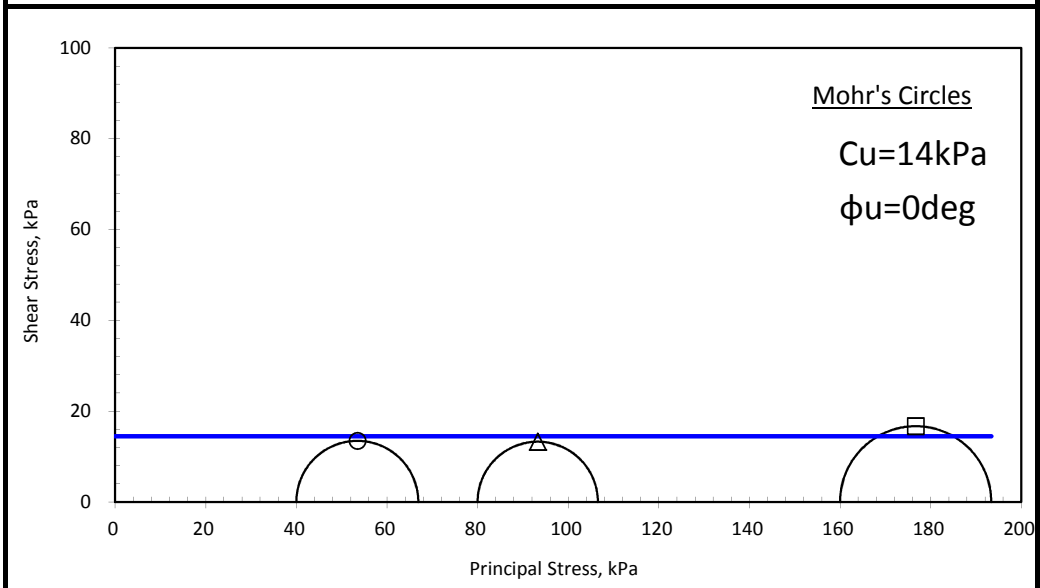
Project :	Preparatory Survey on Matarbari USC Coral-fired Power Project	Project No. :	S27-14
Standard :	ASTM D2850	Date of Testing :	14.10.14
Borehole No.:	LD2-11-1 Depth : 2.00-2.80m	Tested by :	Perera
Sample No. :	HP-1 Strain Rate 1.00 %/min	Checked by :	A. B. Tan

Specimen No.	Condition of Sample	Size of Specimen (mm)		Natural Water Content	Bulk Density	Dy Density	Cell Pressure	Peak Deviator Stress	Modulus of Deformation	Corrected Initial Strain	Strain at Failure
		Height	Diameter	(%)	(Mg/m3)	(Mg/m3)	(kPa)	(kPa)	E50 (kPa)	(%)	(%)
1	Undisturbed	99.80	50.00	65.9	1.61	0.97	40	26.9	639	N/A	8.96
2	Undisturbed	99.80	50.00	58.3	1.65	1.04	80	26.5	727	N/A	11.76
3	Undisturbed	99.80	50.00	54.9	1.64	1.06	160	33.4	858	N/A	15.02
4											



After shearing (Spec. 1)

After shearing (Spec. 2)

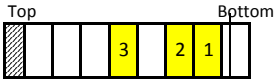


After shearing (Spec. 3)

After shearing (Spec. 4)

Remarks :
- [Strain at failure]=[Recorded strain at failure] - [Corrected Initial Strain]
- Latex membrane with 0.2mm in thickness is used.
- Membrane correction is carried out based on BS 1377 : 1990

Portion Tested

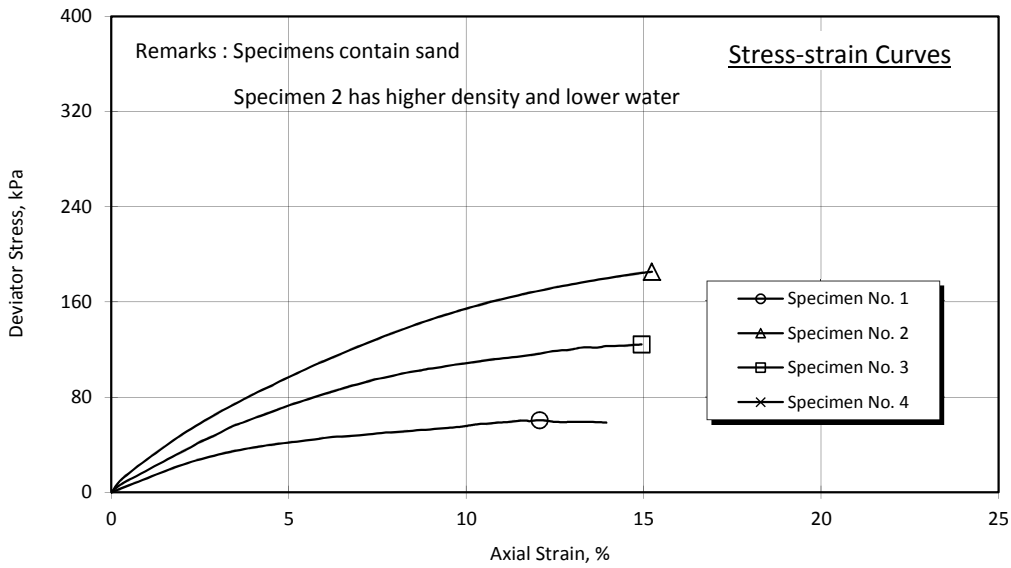


Kiso-Jiban Consultants Co Ltd
Singapore Branch

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

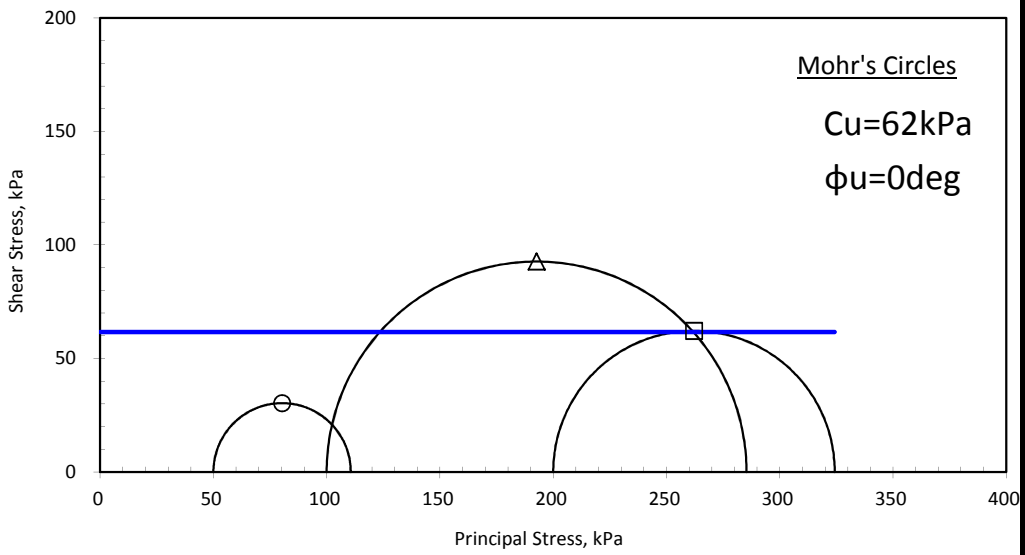
Project :	Preparatory Survey on Matarbari USC Coral-fired Power Project	Project No. :	S27-14
Standard :	ASTM D2850-03a	Date of Testing :	14.10.14
Borehole No.:	LD2-11-1 Depth : 5.00-5.90m	Tested by :	Perera
Sample No. :	HP-2 Strain Rate 1.00 %/min	Checked by :	A. B. Tan

Specimen No.	Condition of Sample	Size of Specimen (mm)		Natural Water Content	Bulk Density	Dy Density	Cell Pressure	Peak Deviator Stress	Modulus of Deformation	Corrected Initial Strain	Strain at Failure
		Height	Diameter	(%)	(Mg/m3)	(Mg/m3)	(kPa)	(kPa)	E50 (kPa)	(%)	(%)
1	Undisturbed	99.80	50.00	35.4	1.88	1.39	50	60.6	1073	N/A	12.06
2	Undisturbed	99.80	50.00	28.6	1.99	1.54	100	185.3	1970	N/A	15.23
3	Undisturbed	99.80	50.00	29.5	1.93	1.49	200	124.3	1550	N/A	14.94
4											



After shearing (Spec. 1)

After shearing (Spec. 2)

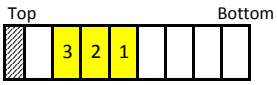


After shearing (Spec. 3)

After shearing (Spec. 4)

Remarks :
- [Strain at failure]=[Recorded strain at failure] - [Corrected Initial Strain]
- Latex membrane with 0.2mm in thickness is used.
- Membrane correction is carried out based on BS 1377 : 1990

Portion Tested

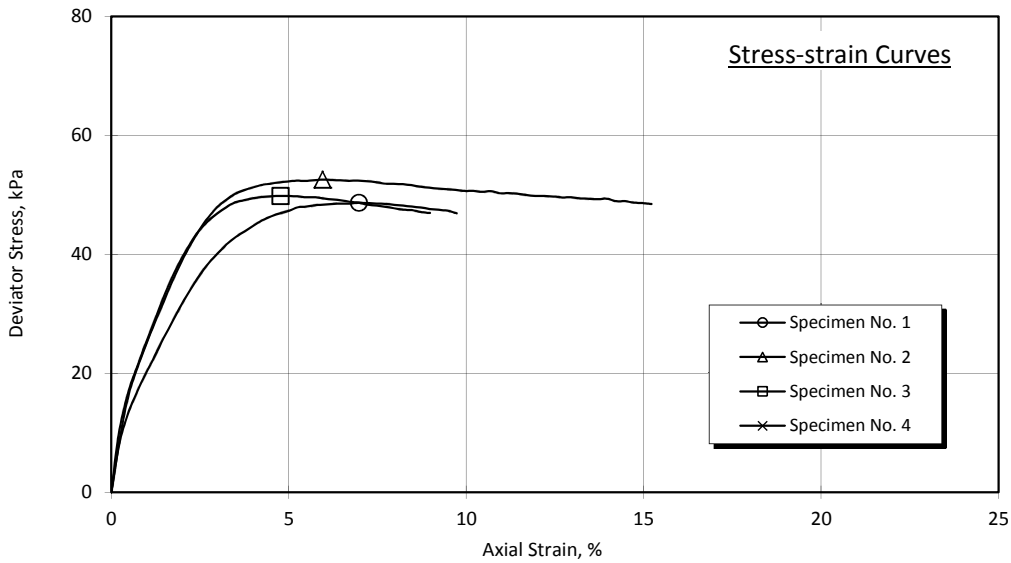


Kiso-Jiban Consultants Co Ltd
Singapore Branch

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

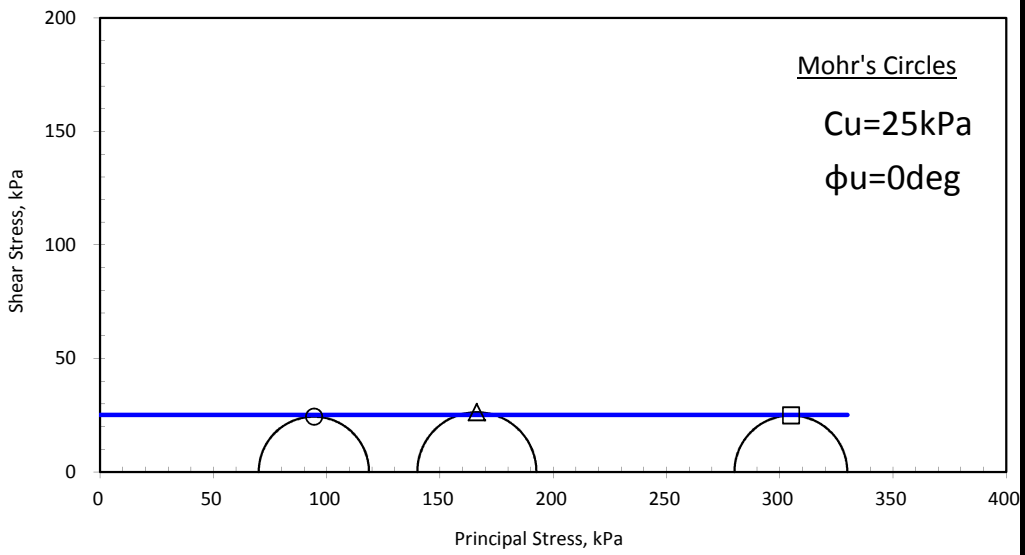
Project :	Preparatory Survey on Matarbari USC Coral-fired Power Project	Project No. :	S27-14
Standard :	ASTM D2850-03a	Date of Testing :	16.10.14
Borehole No.:	LD2-11-1 Depth :8.00-8.90m	Tested by :	Perera
Sample No. :	HP-3 Strain Rate 1.00 %/min	Checked by :	A. B. Tan

Specimen No.	Condition of Sample	Size of Specimen (mm)		Natural Water Content	Bulk Density	Dy Density	Cell Pressure	Peak Deviator Stress	Modulus of Deformation	Corrected Initial Strain	Strain at Failure
		Height	Diameter	(%)	(Mg/m3)	(Mg/m3)	(kPa)	(kPa)	E50 (kPa)	(%)	(%)
1	Undisturbed	99.80	50.00	50.8	1.68	1.11	70	48.7	1816	N/A	6.97
2	Undisturbed	99.80	50.00	49.9	1.70	1.13	140	52.6	2450	N/A	5.95
3	Undisturbed	99.80	50.00	47.1	1.71	1.16	280	49.8	2581	N/A	4.76
4											



After shearing (Spec. 1)

After shearing (Spec. 2)

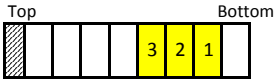


After shearing (Spec. 3)

After shearing (Spec. 4)

Remarks :
- [Strain at failure]=[Recorded strain at failure] - [Corrected Initial Strain]
- Latex membrane with 0.2mm in thickness is used.
- Membrane correction is carried out based on BS 1377 : 1990

Portion Tested



Kiso-Jiban Consultants Co Ltd
Singapore Branch

221

Summary of Consolidated Undrained Triaxial Compression Test
With Porewater Pressure Measurement

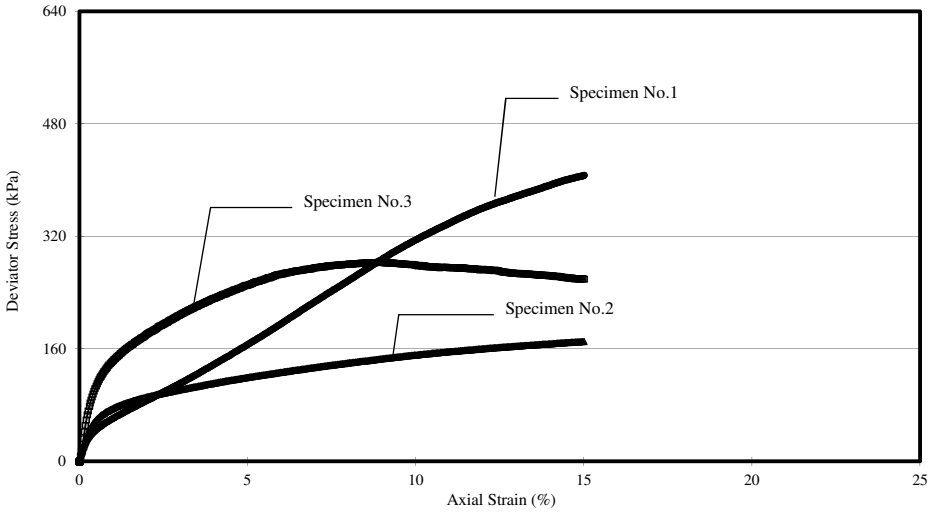
Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 21.10.14		Tested by : Perera		Checked by : A. B. Tan			
Borehole No : LD2-11-1		Sample No.:HP-2		Depth :5.00-5.90m			
Specimen Condition : Undisturbed		Test Method : ASTM D4767-11					
Soil Description : Sandy Silt		Ave. Diameter : 50.0mm			Ave. Height : 99.8mm		
	Specimen No.		1	2	3		
Initial Condition	Wet Density,	Mg/m^3	1.91	1.88	1.85		
	Water Content,	%	30.4	29.3	31.0		
	Dry Density	Mg/m^3	1.47	1.45	1.41		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	580	660		
	B-value		0.97	0.95	0.95		
Consolidation	Cell Pressure	kPa	540	580	660		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	529	566	642		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Total Volume Change,	%	0.34	1.00	1.40		
	Coefficient of Consolidation Cv,	m^2/year	28.70	13.63	10.21		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.09	0.13	0.09		
Compression Stage	Cell Pressure	kPa	540	580	660		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	80	160		
	Shearing Speed	mm/min	0.03	0.03	0.03		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	407	171	283		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	-90	28	73		
	A-Coefficient		-0.22	0.17	0.26		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	15.02	15.01	8.96		
	Effective Principal Stress Ratio		4.12	4.29	4.26		
Final Conditions	Wet Density,	Mg/m^3	1.99	1.94	1.97		
	Water Content,	%	26.9	29.9	28.2		
Shear Strength Parameters	In terms of Effective Stress ϕ' = 37 Degree c ' = 4 kPa		Mode of Failure 1	2	3	4	
Remarks : Specimen 1 contains more sand							

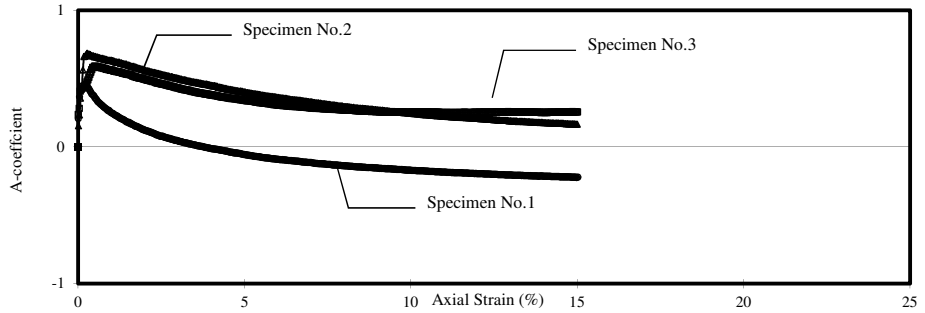
Consolidated Undrained Triaxial Compression Test
With Porewater Pressure Measurement

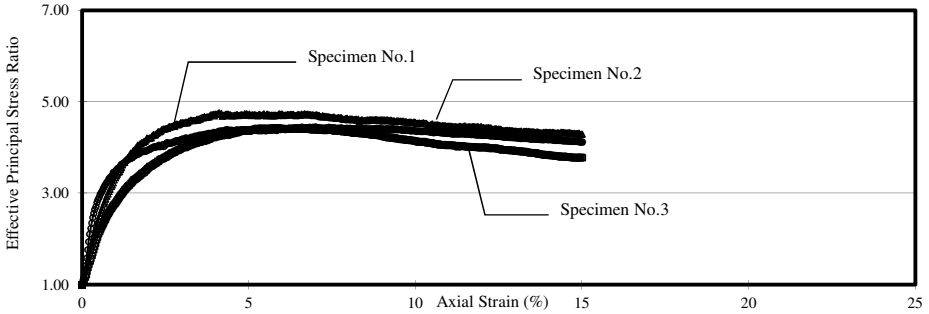
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No.: S27-14 Sample No.: HP-2 Soil Type: Sandy Silt

Borehole No.: LD2-11-1 Depth :5.00-5.90m



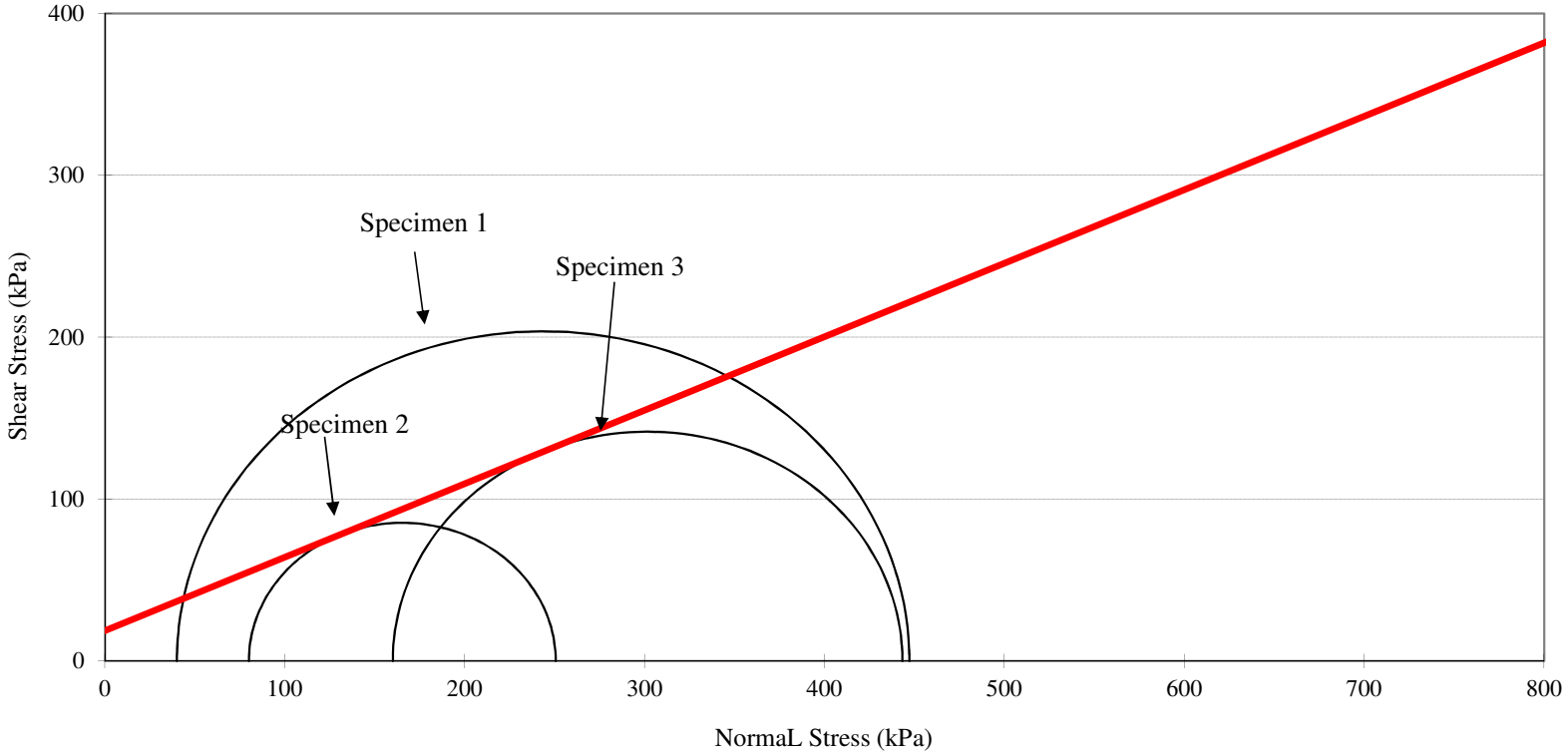




Consolidated Undrained Triaxial Compression Test
With Pore water Pressure Measurement
- Mohr' s Circle (In terms of Total Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14

Borehole No.: LD2-11-1 Soil Type: Sandy Silt
Sample No. : HP-2 Depth :5.00-5.90m
Angle of Internal Friction, ϕ 24 deg
Cohesion, c 19 kPa



Kiso-Jiban Consultants Co., Ltd.

Consolidated Undrained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Effective Stress at Peak Deviator Stress)-

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

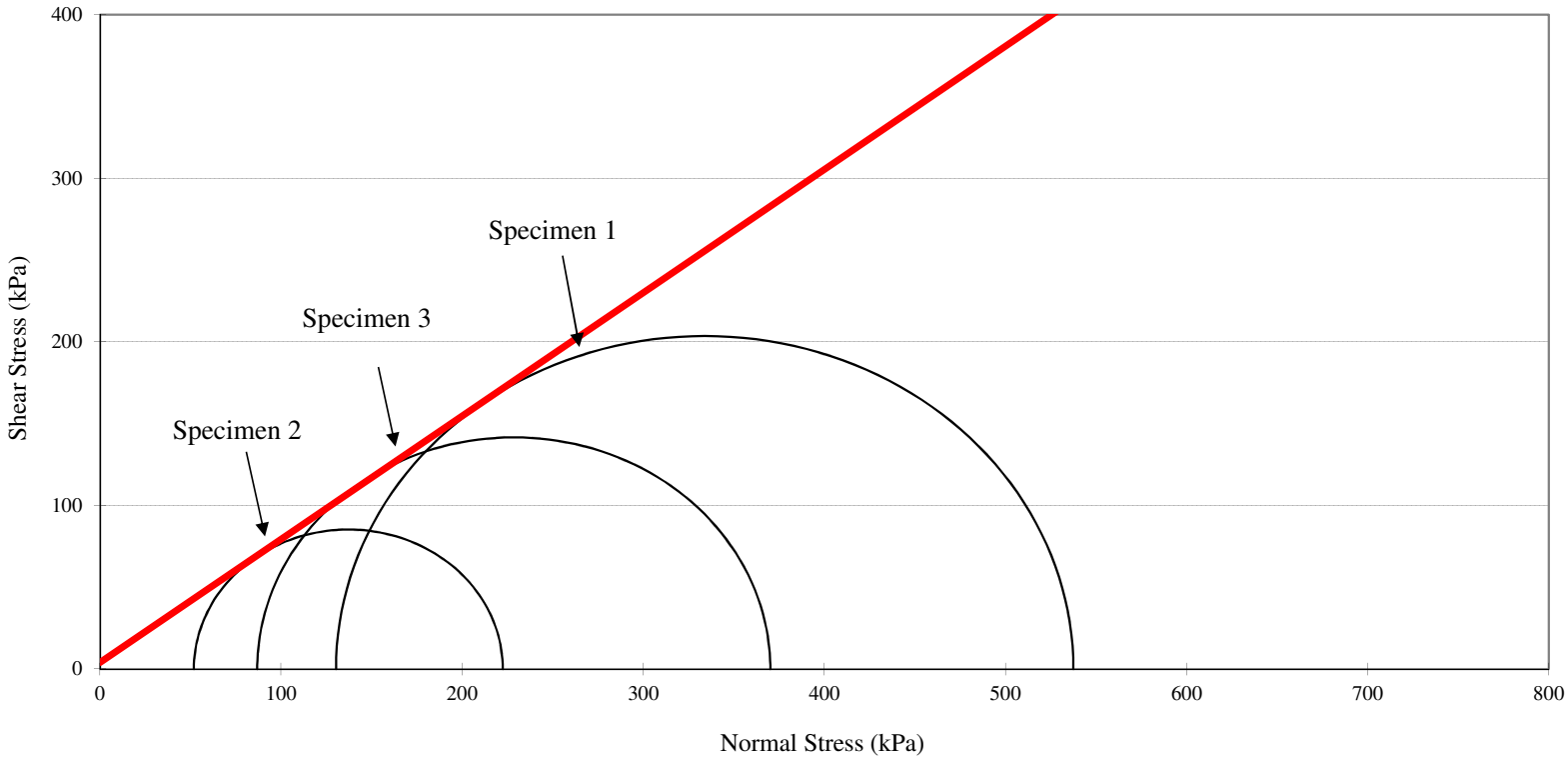
Project No. : S27-14

Borehole No.: LD2-11-1 Soil Type: Sandy Silt

Sample No. : HP-2 Depth :5.00-5.90m

Angle of Internal Friction, ϕ' 37 deg

Cohesion, c' 4 kPa



Kiso-Jiban Consultants Co., Ltd.

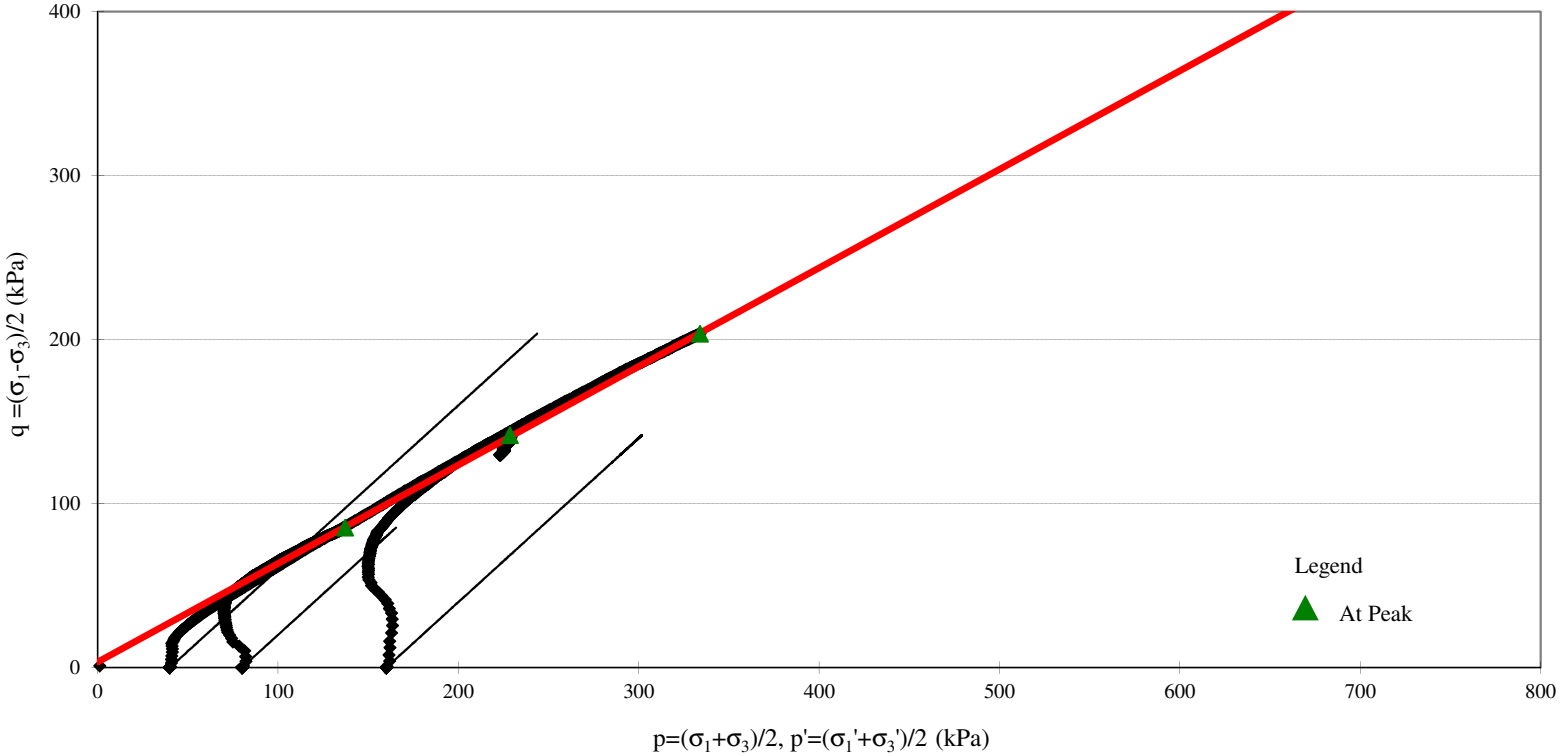
Consolidated Undrained Triaxial Compression Test
With Pore water Pressure Measurement
- Stress Path -

Borehole No.: LD2-11-1 Soil Type: Sandy Silt

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project Sample No. : HP-2 Depth :5.00-5.90m

Project No. : S27-14

α'	31	deg
a'	3	kPa



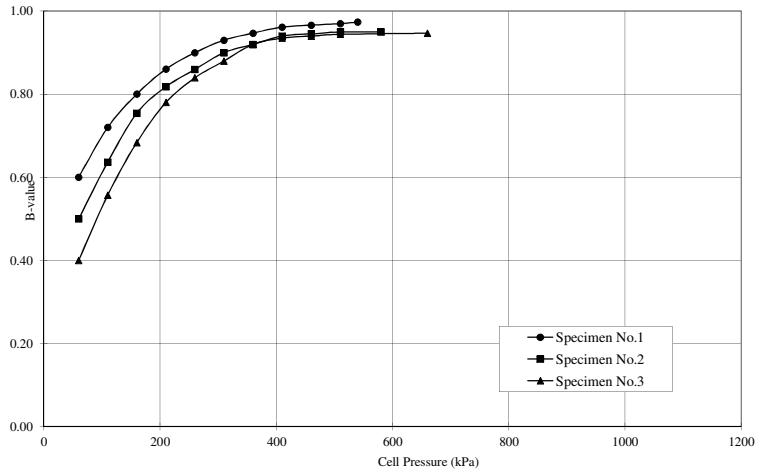
Kiso-Jiban Consultants Co., Ltd.

226

Consolidated Undrained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

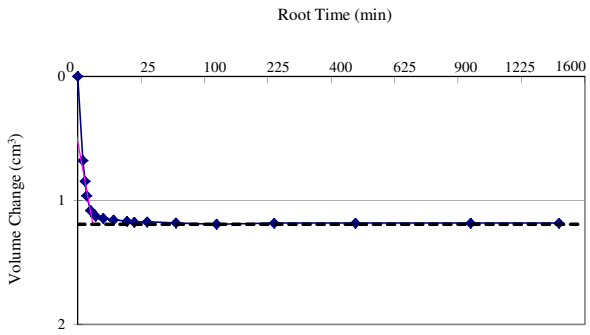
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: LD2-11-1 Depth : 5.00-5.90m
Sample No.: HP-2 Soil Type: Sandy Silt

		Result of B-value Check					
		Specimen 1		Specimen 2		Specimen 3	
		Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60
	P.W.P (kPa)	20	38.0	20	35.0	20	32.0
	Back Pressure (kPa)	20		20		20	
	B-value	0.60		0.50		0.40	
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110
	P.W.P (kPa)	50	86.0	50	81.8	50	77.9
	Back Pressure (kPa)	50		50		50	
	B-value	0.72		0.64		0.56	
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160
	P.W.P (kPa)	100	140.0	100	137.7	100	134.2
	Back Pressure (kPa)	100		100		100	
	B-value	0.80		0.75		0.68	
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210
	P.W.P (kPa)	150	193.0	150	190.9	150	189.0
	Back Pressure (kPa)	150		150		150	
	B-value	0.86		0.82		0.78	
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260
	P.W.P (kPa)	200	245.0	200	243.0	200	242.0
	Back Pressure (kPa)	200		200		200	
	B-value	0.90		0.86		0.84	
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310
	P.W.P (kPa)	250	296.5	250	295.0	250	294.0
	Back Pressure (kPa)	250		250		250	
	B-value	0.93		0.90		0.88	
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360
	P.W.P (kPa)	300	347.4	300	346.0	300	346.0
	Back Pressure (kPa)	300		300		300	
	B-value	0.95		0.92		0.92	
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410
	P.W.P (kPa)	350	398.1	350	397.0	350	396.8
	Back Pressure (kPa)	350		350		350	
	B-value	0.96		0.94		0.94	
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460
	P.W.P (kPa)	400	448.3	400	447.3	400	447.0
	Back Pressure (kPa)	400		400		400	
	B-value	0.97		0.95		0.94	
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510
	P.W.P (kPa)	450	498.5	450	497.5	450	497.2
	Back Pressure (kPa)	450		450		450	
	B-value	0.97		0.95		0.94	
B-check Step.11	Cell Pressure (kPa)	510	540	510	580	510	660
	P.W.P (kPa)	500	529.2	500	566.5	500	642.0
	Back Pressure (kPa)	500		500		500	
	B-value	0.97		0.95		0.95	



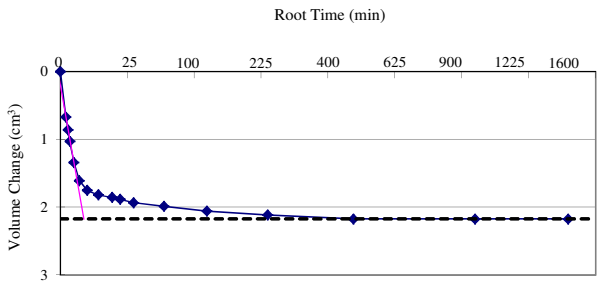
Consolidated Undrained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: HP-2 Soil Type: Sandy Silt
Borehole No.: LD2-11-1 Depth : 5.00-5.90m



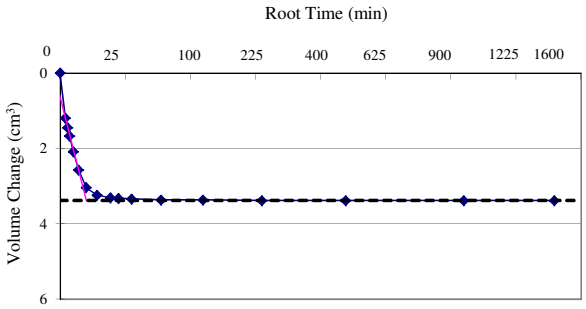
Specimen No.: 1

p' =	40	kPa
t100 =	1.4	min
Cv =	28.70	m^2/year
mvi=	0.09	m^2/MN



Specimen No.: 2

p' =	80	kPa
t100 =	3.0	min
Cv =	13.63	m^2/year
mvi=	0.13	m^2/MN



Specimen No.: 3

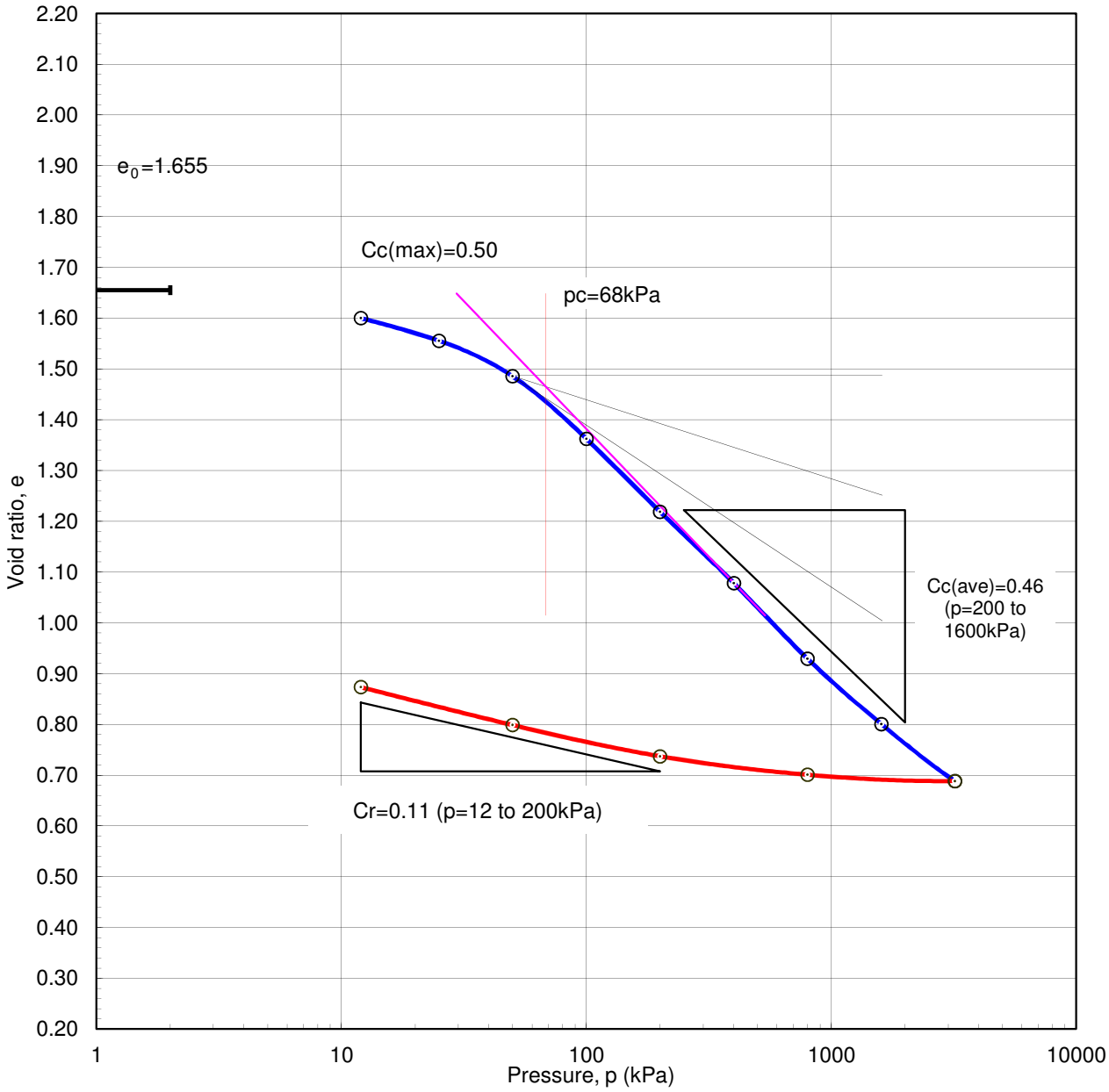
p' =	160	kPa
t100 =	4.0	min
Cv =	10.21	m^2/year
mvi=	0.09	m^2/MN

CONSOLIDATION TEST (e-log p curves)

Preparatory Survey on Matarbari USC Coal-fired Power

Project :	Project			Borehole No. :	LD2-11-1
Project No.:	S27-14	Tested by :	Lim	Sample No. :	HP-1
Soil Type :	Clay	Checked by :	A. B. Tan	Depth of Sample :	2.00-2.80 m

Sample No.	Depth of sample (m)	Initial void ratio e_o	Preconsolidation Pressure, p_c (kPa)	Compression Index Cc		Swell Index Cr	Unload-reload-Compression Index Cur
HP-1	2.00-2.80	1.655	68	0.50 (max)	0.46(average)	0.11 (average)	N/A

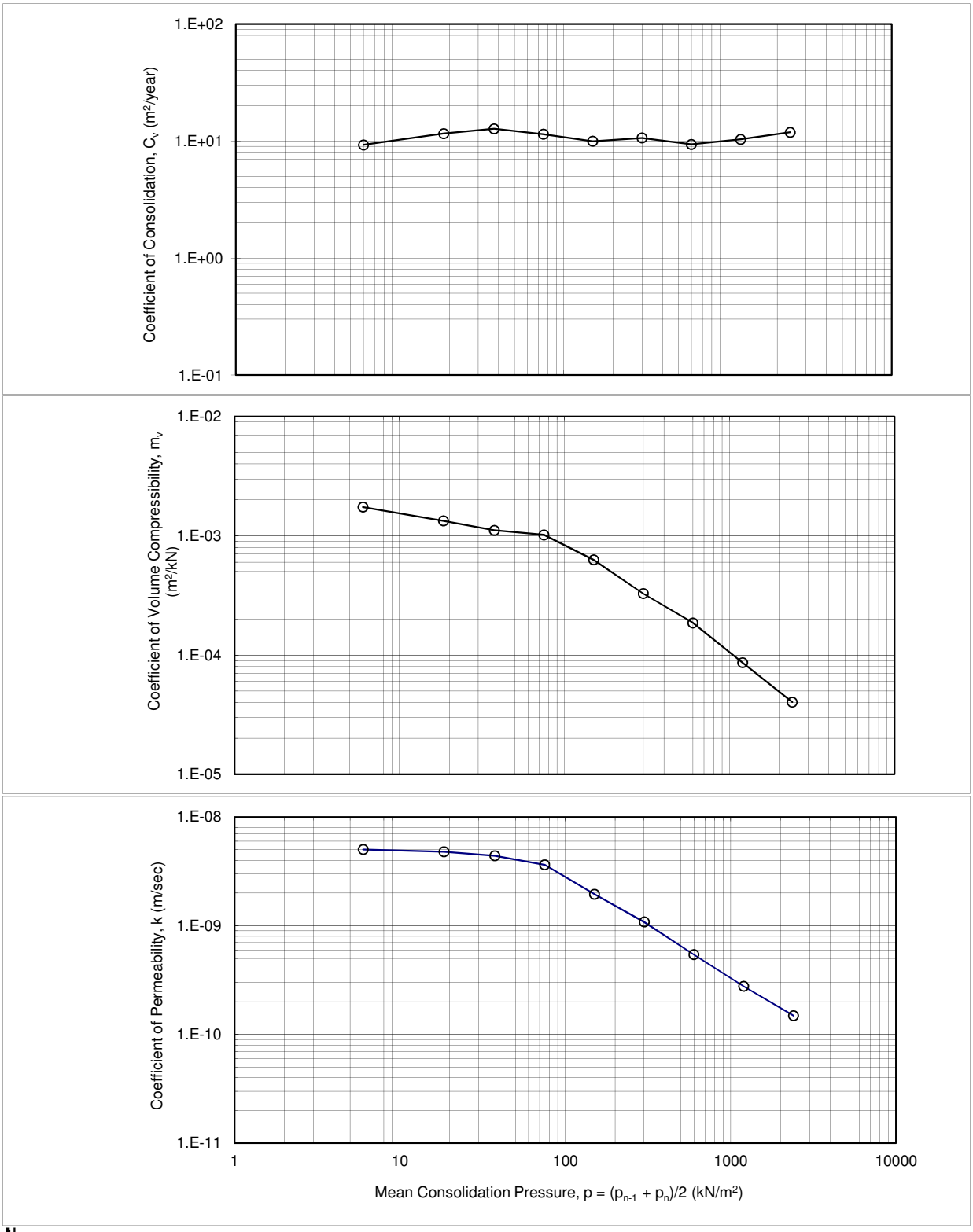


KISO-JIBAN CONSULTANTS CO., LTD.

229

Consolidation Test (p - $\overline{c}v$, mv , k curves)

Project :	Preparatory Survey on Matarbari USC Coal-fired Power Project			Borehole No. :	LD2-11-1
Project No. :	S27-14			Sample No. :	HP-1
Date of testing :	8-Oct-14	Tested by :	Lim	Depth of Sample :	2.00-2.80 m



KISO-JIBAN CONSULTANTS CO., LTD.

PROJECT NAME : Preparatory Survey on Matarbari USC Coal-fired Power Project
PROJECT NO. : S27-14
BOREHOLE NO. : LD2-11-1
TESTING STANDARD : ASTM D2435-11
DATE : 8-Oct-14
SAMPLE NO. : HP-1
INITIAL HEIGHT OF SPECIMEN : 18.000 mm
NO. OF LOADING STEP : 9
DEPTH : 2.00-2.80 m
DIAMETER OF SPECIMEN : 53.900 mm
SPECIFIC GRAVITY : 2.72
TESTER NO. : 13
DRY WEIGHT OF SPECIMEN : 42.080 grams
SOLID HEIGHT OF SPECIMEN : 6.780 mm
INITIAL MOISTURE CONTENT : 57.7 %
BULK DENSITY : 1.64 Mg/m^3
METHOD OF TIME FITTING USED : SQUARE ROOT TIME CURVE - FITTING METHOD
LABORATORY TEMPERATURE : 23.0 ^oC

PRESSURE kN/m^2	PRESSURE INCREMENT kN/m^2	CHANGE IN HEIGHT *E-2 mm	HEIGHT mm	AVERAGE HEIGHT mm	STRAIN %	MV m^2/kN	VOLUME RATIO	VOID RATIO
0.000			18.000				2.655	1.655
	12.000	37.2		17.814	2.09	1.74E-03		
12.000			17.628				2.600	1.600
	13.000	30.2		17.477	1.73	1.33E-03		
25.000			17.326				2.555	1.555
	25.000	47.4		17.089	2.77	1.11E-03		
50.000			16.852				2.486	1.486
	50.000	83.5		16.435	5.08	1.02E-03		
100.000			16.017				2.362	1.362
	100.000	97.4		15.530	6.27	6.27E-04		
200.000			15.043				2.219	1.219
	200.000	95.4		14.566	6.55	3.27E-04		
400.000			14.089				2.078	1.078
	400.000	100.9		13.585	7.43	1.86E-04		
800.000			13.080				1.929	0.929
	800.000	87.1		12.645	6.89	8.61E-05		
1600.000			12.209				1.801	0.801
	1600.000	76.1		11.829	6.43	4.02E-05		
3200.000			11.448				1.688	0.688

PRESSURE kN/m^2	AVERAGE PRESSURE kN/m^2	T90 min	CV m^2/sec	CV m^2/day	CV m^2/year	PRIMARY COMPRESSION *E-2 mm	PRIMARY COMPRESSION RATIO	COEFFICIENT OF PERMEABILITY m/sec
0.000								
	6.000	3.55	2.94E-07	2.54E-02	9.27E+00	17.9	0.482	5.02E-09
12.000								
	18.500	2.73	3.67E-07	3.17E-02	1.16E+01	13.1	0.433	4.79E-09
25.000								
	37.500	2.38	4.04E-07	3.49E-02	1.27E+01	17.0	0.359	4.39E-09
50.000								
	75.000	2.44	3.63E-07	3.14E-02	1.15E+01	37.8	0.427	3.62E-09
100.000								
	150.000	2.51	3.16E-07	2.73E-02	9.97E+00	35.2	0.403	1.94E-09
200.000								
	300.000	2.07	3.37E-07	2.91E-02	1.06E+01	42.6	0.429	1.08E-09
400.000								
	600.000	2.04	2.97E-07	2.57E-02	9.37E+00	43.1	0.423	5.41E-10
800.000								
	1200.000	1.60	3.28E-07	2.83E-02	1.03E+01	36.0	0.413	2.77E-10
1600.000								
	2400.000	1.22	3.76E-07	3.25E-02	1.19E+01	29.5	0.388	1.48E-10
3200.000								

REBOUND

P	800.000	200.000	50.000	12.000
H	11.532	11.778	12.195	12.701
E	0.701	0.737	0.799	0.873

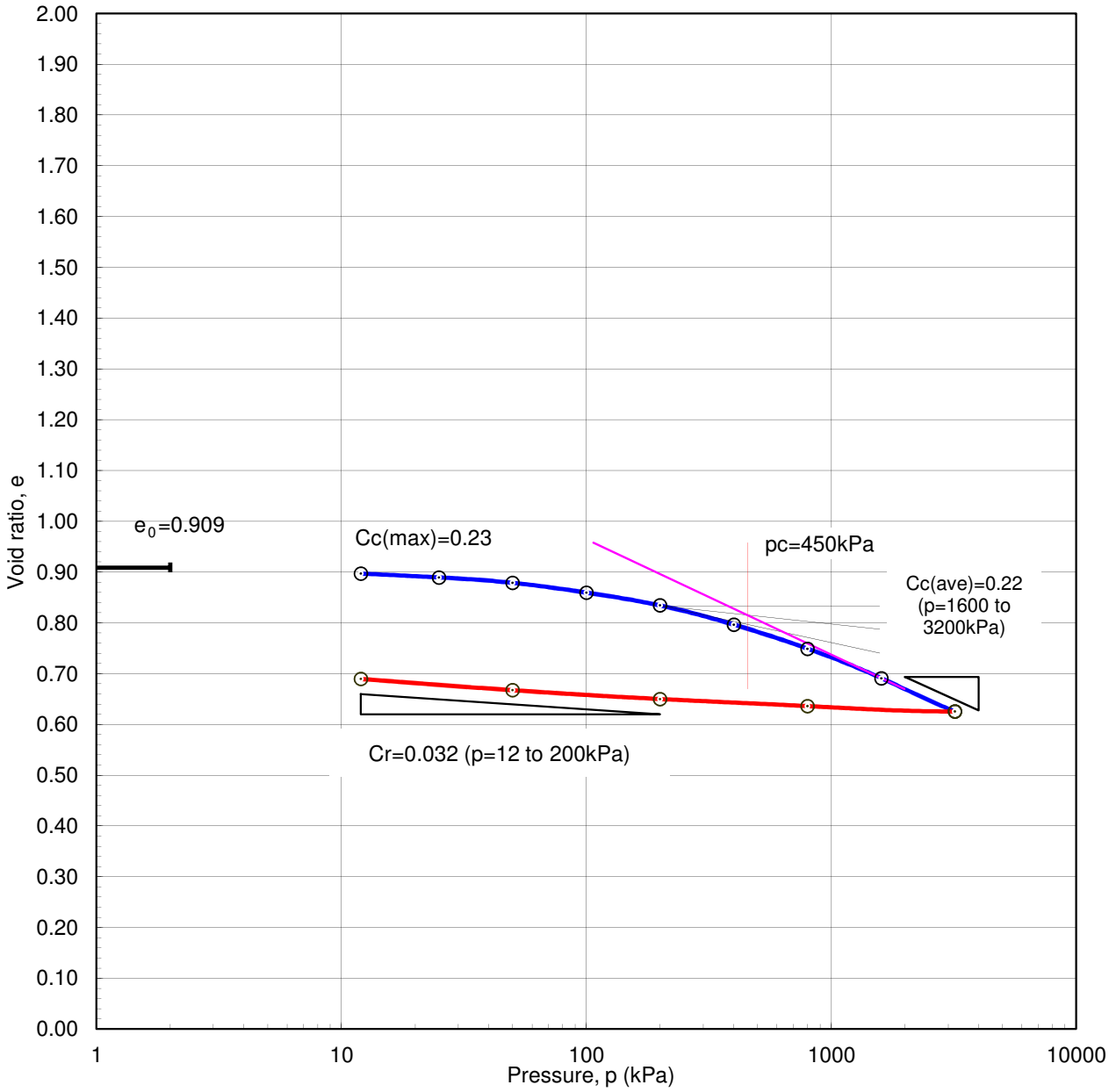
KISO-JIBAN CONSULTANTS CO., LTD.

CONSOLIDATION TEST (e-log p curves)

Preparatory Survey on Matarbari USC Coal-fired Power

Project :	Project			Borehole No. :	LD2-11-1
Project No.:	S27-14	Tested by :	Lim	Sample No. :	HP-2
Soil Type :	Sandy Silt	Checked by :	A. B. Tan	Depth of Sample :	5.00-5.90 m

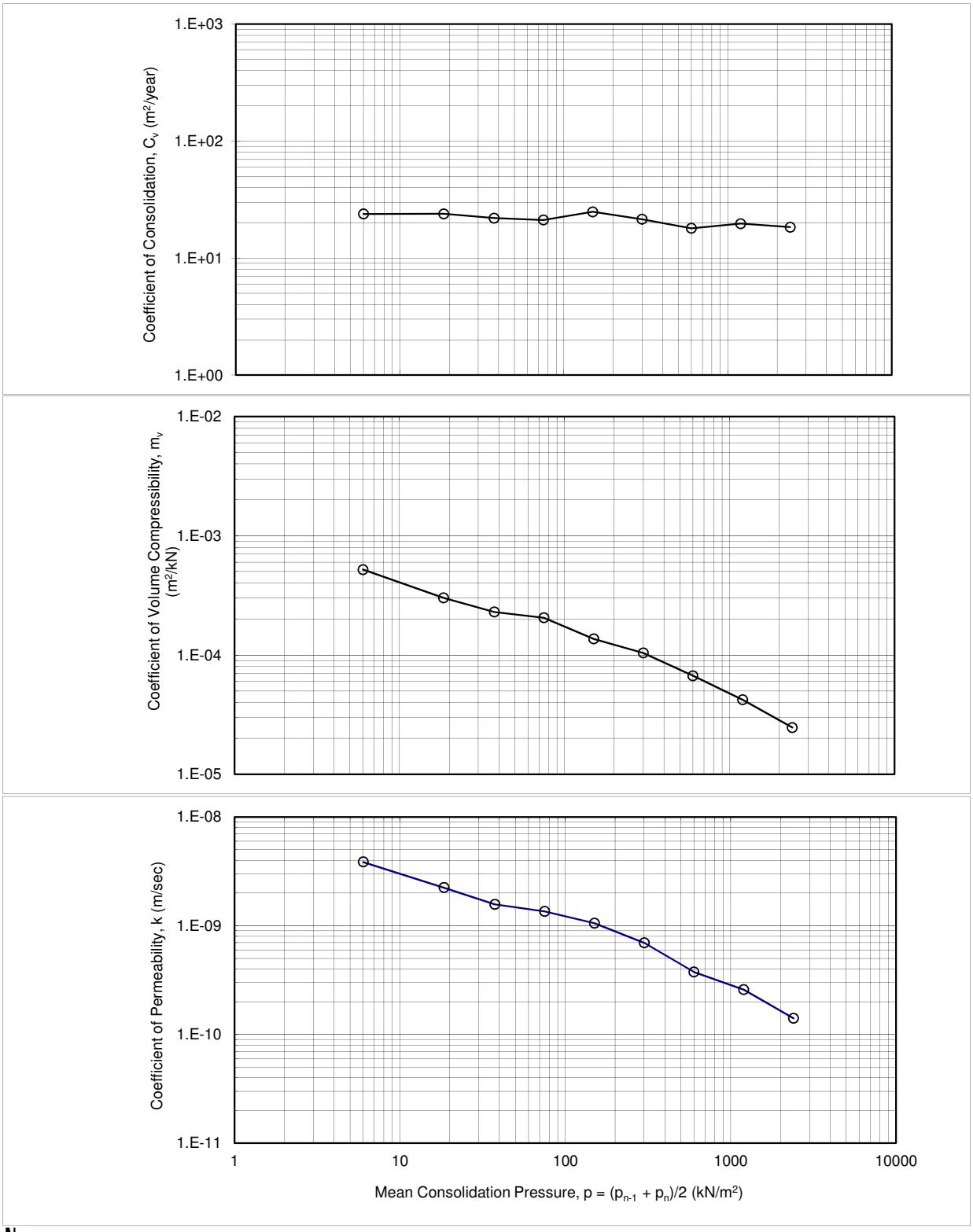
Sample No.	Depth of sample (m)	Initial void ratio e_o	Preconsolidation Pressure, p_c (kPa)	Compression Index Cc		Swell Index Cr	Unload-reload-Compression Index Cur
HP-2	5.00-5.90	0.909	450	0.23 (max)	0.22(average)	0.032 (average)	N/A



KISO-JIBAN CONSULTANTS CO., LTD.

Consolidation Test (p - $\overline{c}v$, mv , k curves)

Project :	Preparatory Survey on Matarbari USC Coal-fired Power Project	Borehole No. :	LD2-11-1
Project No. :	S27-14	Sample No. :	HP-2
Date of testing :	8-Oct-14 Tested by : Lim	Depth of Sample :	5.00-5.90 m



KISO-JIBAN CONSULTANTS CO., LTD.

PROJECT NAME : Preparatory Survey on Matarbari USC Coal-fired Power Project
PROJECT NO. : S27-14
BOREHOLE NO. : LD2-11-1
TESTING STANDARD : ASTM D2435-11
DATE : 8-Oct-14
SAMPLE NO. : HP-2
INITIAL HEIGHT OF SPECIMEN : 18.000 mm
NO. OF LOADING STEP : 9
DEPTH : 5.00-5.90 m
DIAMETER OF SPECIMEN : 53.900 mm
SPECIFIC GRAVITY : 2.71
TESTER NO. : 14
DRY WEIGHT OF SPECIMEN : 58.310 grams
SOLID HEIGHT OF SPECIMEN : 9.430 mm
INITIAL MOISTURE CONTENT : 31.5 %
BULK DENSITY : 1.89 Mg/m^3
METHOD OF TIME FITTING USED : SQUARE ROOT TIME CURVE - FITTING METHOD
LABORATORY TEMPERATURE : 23.0 ^oC

PRESSURE kN/m^2	PRESSURE INCREMENT kN/m^2	CHANGE IN HEIGHT *E-2 mm	HEIGHT mm	AVERAGE HEIGHT mm	STRAIN %	MV m^2/kN	VOLUME RATIO	VOID RATIO
0.000			18.000				1.909	0.909
	12.000	11.2		17.944	0.62	5.20E-04		
12.000			17.888				1.897	0.897
	13.000	7.0		17.853	0.39	3.02E-04		
25.000			17.818				1.890	0.890
	25.000	10.2		17.767	0.57	2.30E-04		
50.000			17.716				1.879	0.879
	50.000	18.1		17.626	1.03	2.05E-04		
100.000			17.535				1.859	0.859
	100.000	23.8		17.416	1.37	1.37E-04		
200.000			17.297				1.834	0.834
	200.000	35.6		17.119	2.08	1.04E-04		
400.000			16.941				1.797	0.797
	400.000	44.8		16.717	2.68	6.70E-05		
800.000			16.493				1.749	0.749
	800.000	54.7		16.220	3.37	4.22E-05		
1600.000			15.946				1.691	0.691
	1600.000	61.7		15.638	3.95	2.47E-05		
3200.000			15.329				1.626	0.626

PRESSURE kN/m^2	AVERAGE PRESSURE kN/m^2	T90 min	CV m^2/sec	CV m^2/day	CV m^2/year	PRIMARY COMPRESSION *E-2 mm	PRIMARY COMPRESSION RATIO	COEFFICIENT OF PERMEABILITY m/sec
0.000								
	6.000	1.40	7.56E-07	6.53E-02	2.38E+01	1.2	0.104	3.86E-09
12.000								
	18.500	1.38	7.57E-07	6.54E-02	2.39E+01	1.1	0.152	2.24E-09
25.000								
	37.500	1.49	6.96E-07	6.02E-02	2.20E+01	1.8	0.177	1.57E-09
50.000								
	75.000	1.52	6.71E-07	5.79E-02	2.11E+01	2.6	0.144	1.35E-09
100.000								
	150.000	1.27	7.87E-07	6.80E-02	2.48E+01	2.5	0.105	1.05E-09
200.000								
	300.000	1.41	6.81E-07	5.88E-02	2.15E+01	4.4	0.124	6.95E-10
400.000								
	600.000	1.61	5.69E-07	4.92E-02	1.80E+01	5.3	0.119	3.74E-10
800.000								
	1200.000	1.39	6.23E-07	5.39E-02	1.97E+01	6.2	0.113	2.58E-10
1600.000								
	2400.000	1.38	5.82E-07	5.03E-02	1.84E+01	7.3	0.118	1.41E-10
3200.000								

REBOUND

P	800.000	200.000	50.000	12.000
H	15.428	15.559	15.723	15.931
E	0.636	0.650	0.667	0.689

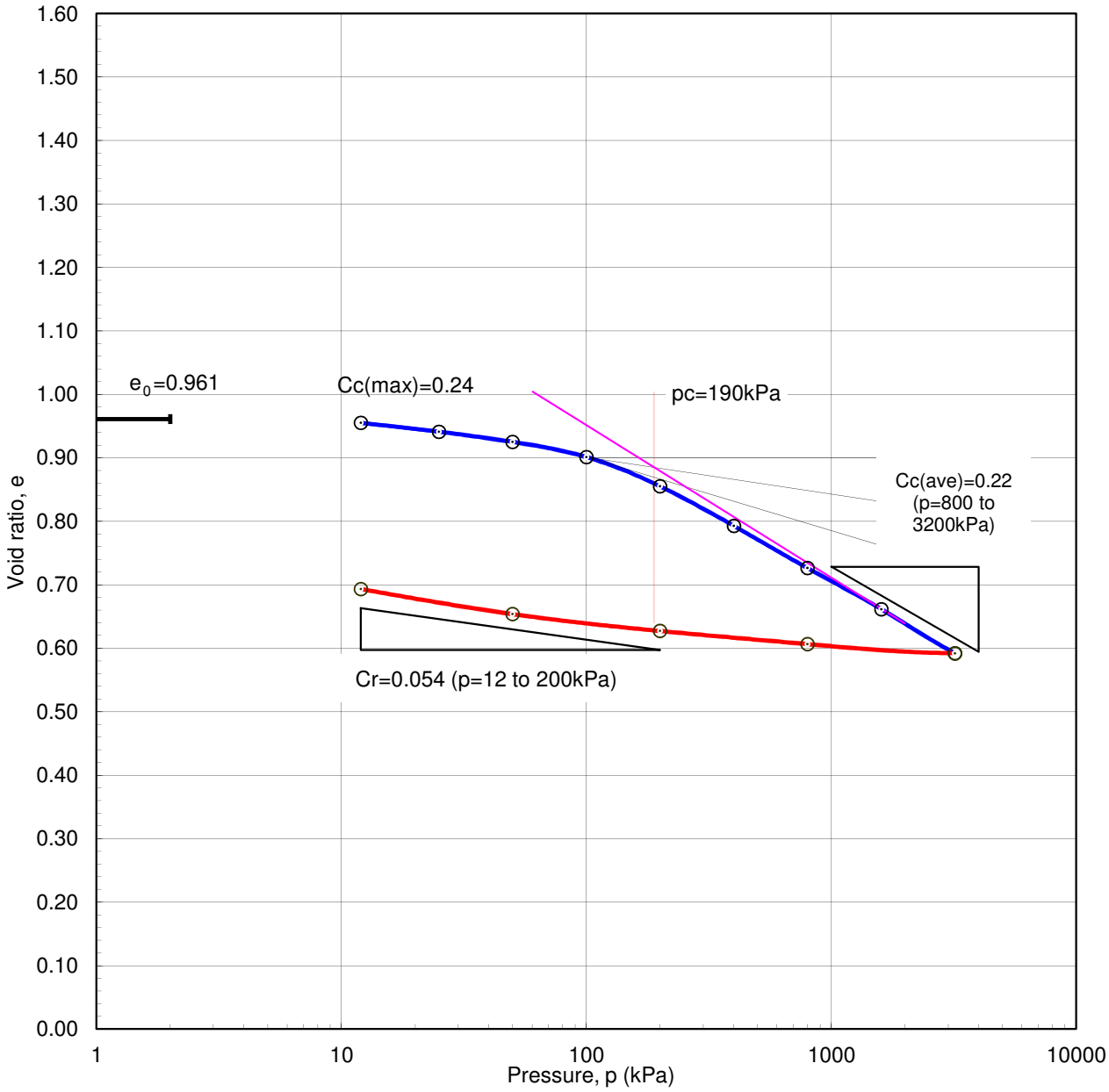
KISO-JIBAN CONSULTANTS CO., LTD.

CONSOLIDATION TEST (e-log p curves)

Preparatory Survey on Matarbari USC Coal-fired Power

Project :	Project			Borehole No. :	LD2-11-1
Project No.:	S27-14	Tested by :	Lim	Sample No. :	HP-3
Soil Type :	Clay	Checked by :	A. B. Tan	Depth of Sample :	8.00-8.90 m

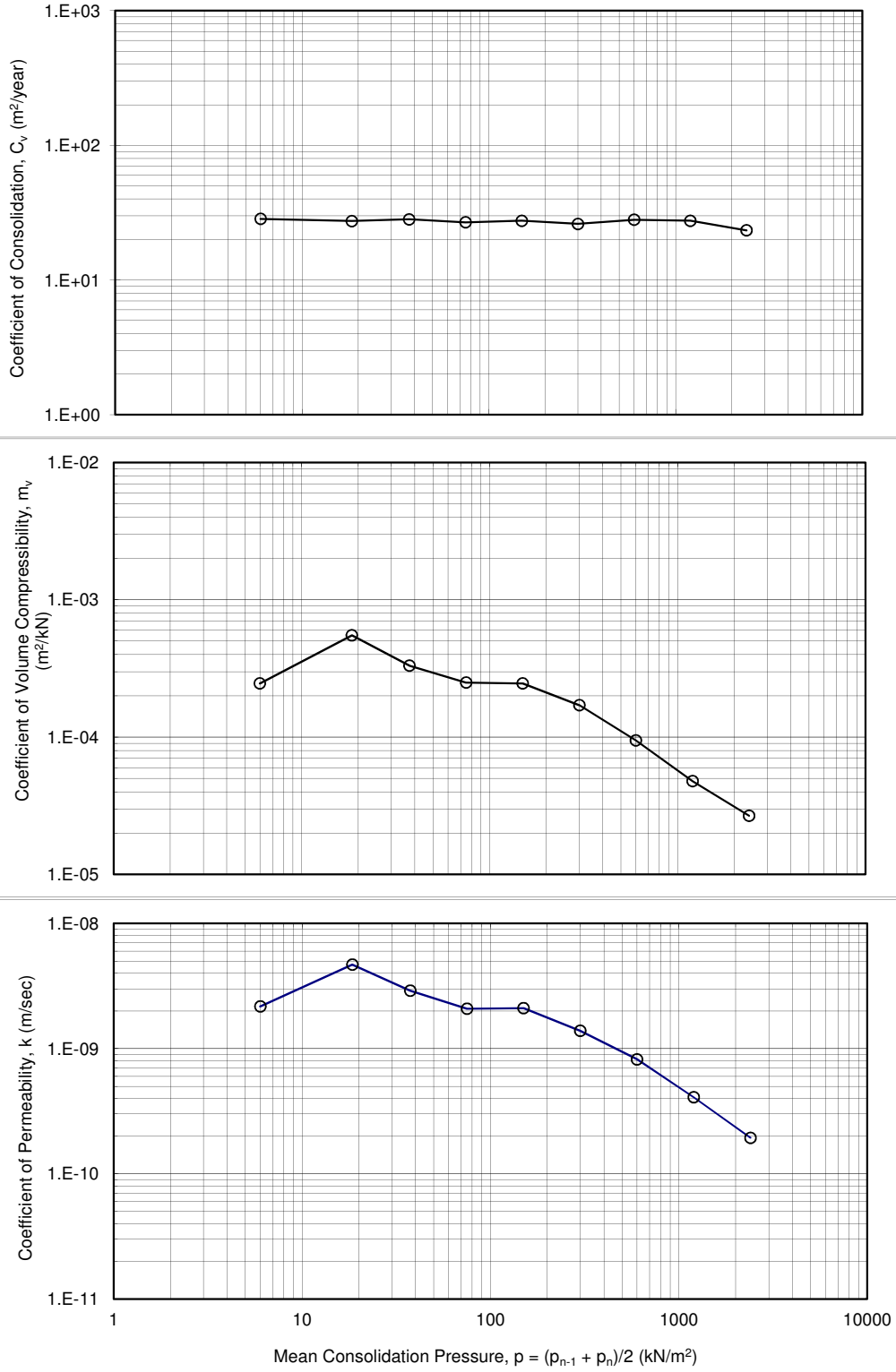
Sample No.	Depth of sample (m)	Initial void ratio e_o	Preconsolidation Pressure, p_c (kPa)	Compression Index Cc		Swell Index Cr	Unload-reload-Compression Index Cur
HP-3	8.00-8.80	0.961	190	0.24 (max)	0.22(average)	0.054 (average)	N/A



KISO-JIBAN CONSULTANTS CO., LTD.

Consolidation Test (p - $\overline{c}v$, mv , k curves)

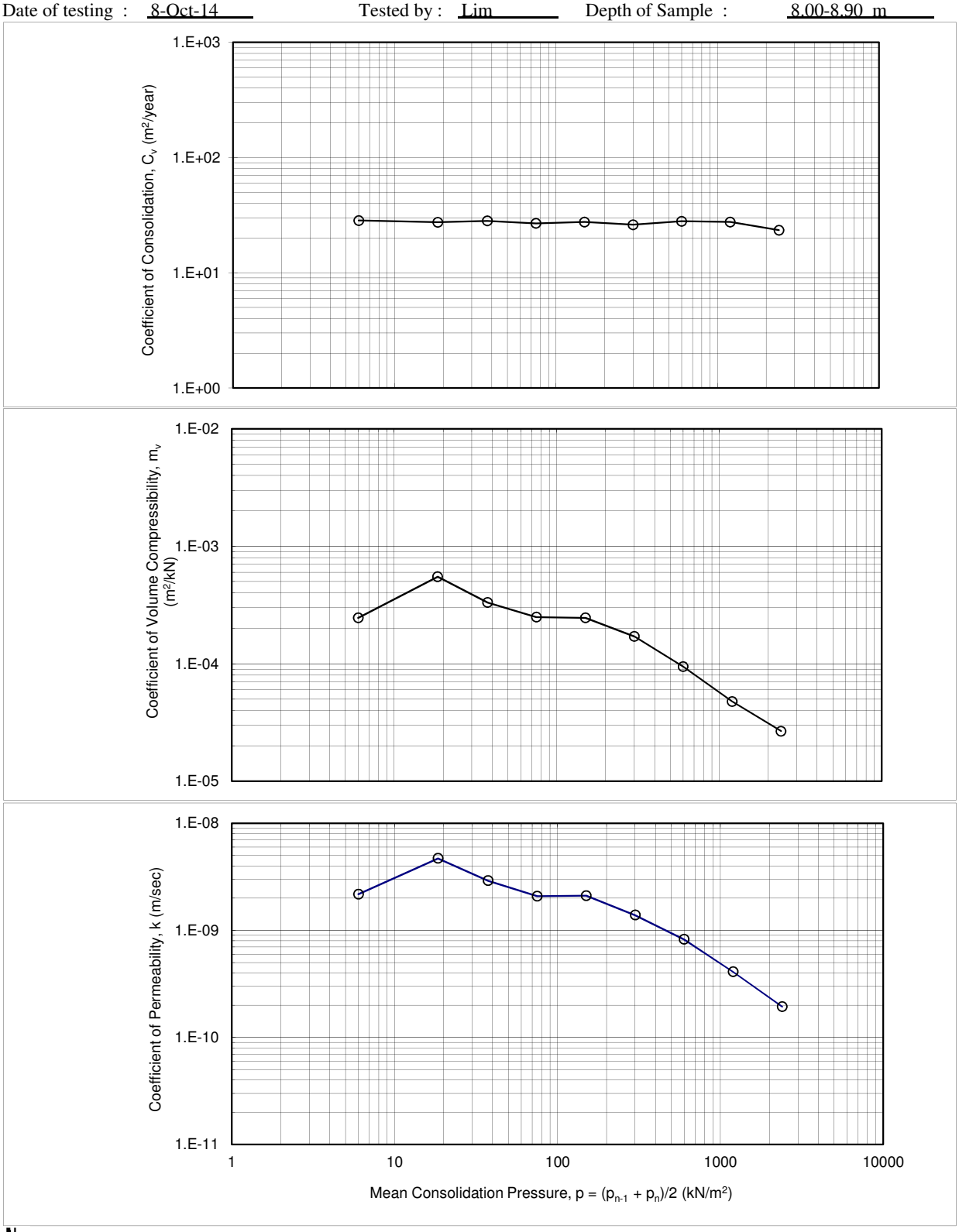
Project :	Preparatory Survey on Matarbari USC Coal-fired Power Project			Borehole No. :	LD2-11-1
Project No. :	S27-14			Sample No. :	HP-3
Date of testing :	8-Oct-14	Tested by :	Lim	Depth of Sample :	8.00-8.90 m



KISO-JIBAN CONSULTANTS CO., LTD.

Consolidation Test (p - $\overline{c}v$, mv , k curves)

Project :	Preparatory Survey on Matarbari USC Coal-fired Power Project			Borehole No. :	LD2-11-1
Project No. :	S27-14			Sample No. :	HP-3
Date of testing :	8-Oct-14	Tested by :	Lim	Depth of Sample :	8.00-8.90 m



KISO-JIBAN CONSULTANTS CO., LTD.

Summary of Consolidated Drained Triaxial Compression Test

Project No.: S27-14	Project :Preparatory Survey on Matarbari USC Coral-fired Power Project		
Date Tested : 09.12.14	Tested by : Perera	Checked by : A. B. Tan	
Borehole No.: LD2-11-1	Sample No.:D-1	Depth :14.00-14.80m	
Specimen Condition : Remoulded	Test Method : ASTM D7181-11		
Soil Description : Silty Sand	Ave. Diameter : 50.0mm	Ave. Height : 100.0mm	

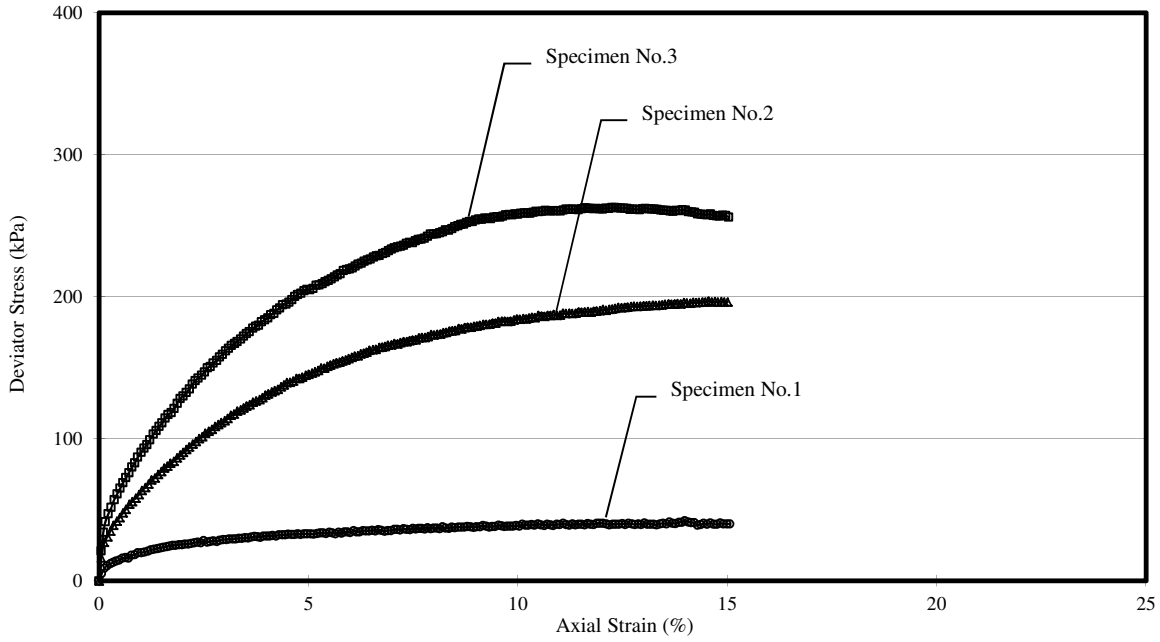
	Specimen No.		1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.66	1.66	1.66		
Saturation Stage	Saturated PWP,	kPa	200	200	200		
	Final Cell Pressure,	kPa	240	270	300		
	B-value		0.97	0.95	0.96		
Consolidation Stage	Cell Pressure	kPa	240	270	300		
	Back Pressure	kPa	200	200	200		
	Initial PWP,	kPa	229	257	286		
	Final PWP	kPa	200	200	200		
Consolidation Parameter	Volume Change,	%	0.78	0.69	0.86		
	Coefficient of Consolidation Cv,	m^2/year	2.84	8.55	9.42		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.20	0.10	0.09		
Compression Stage	Cell Pressure	kPa	240	270	300		
	Back Pressure	kPa	200	200	200		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	42	197	263		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-0.21	1.34	2.48		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	13.99	14.55	12.25		
Shear Strength Parameters	In terms of Effective Stress $\phi' = 35$ deg $c' = 0$ kPa		Mode of Failure				
			1	2	3	4	

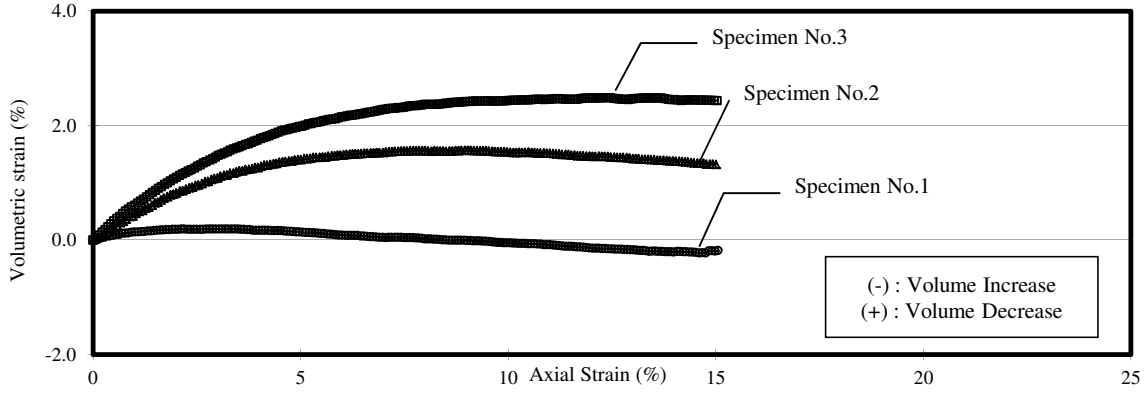
Remarks :

Specimens are prepared at 90% of Maximum dry density (from compaction Test) = $1.66 Mg/m^3$

Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-1 Soil Type: Silty Sand
Borehole No.: LD2-11-1 Depth : 14.00-14.80m



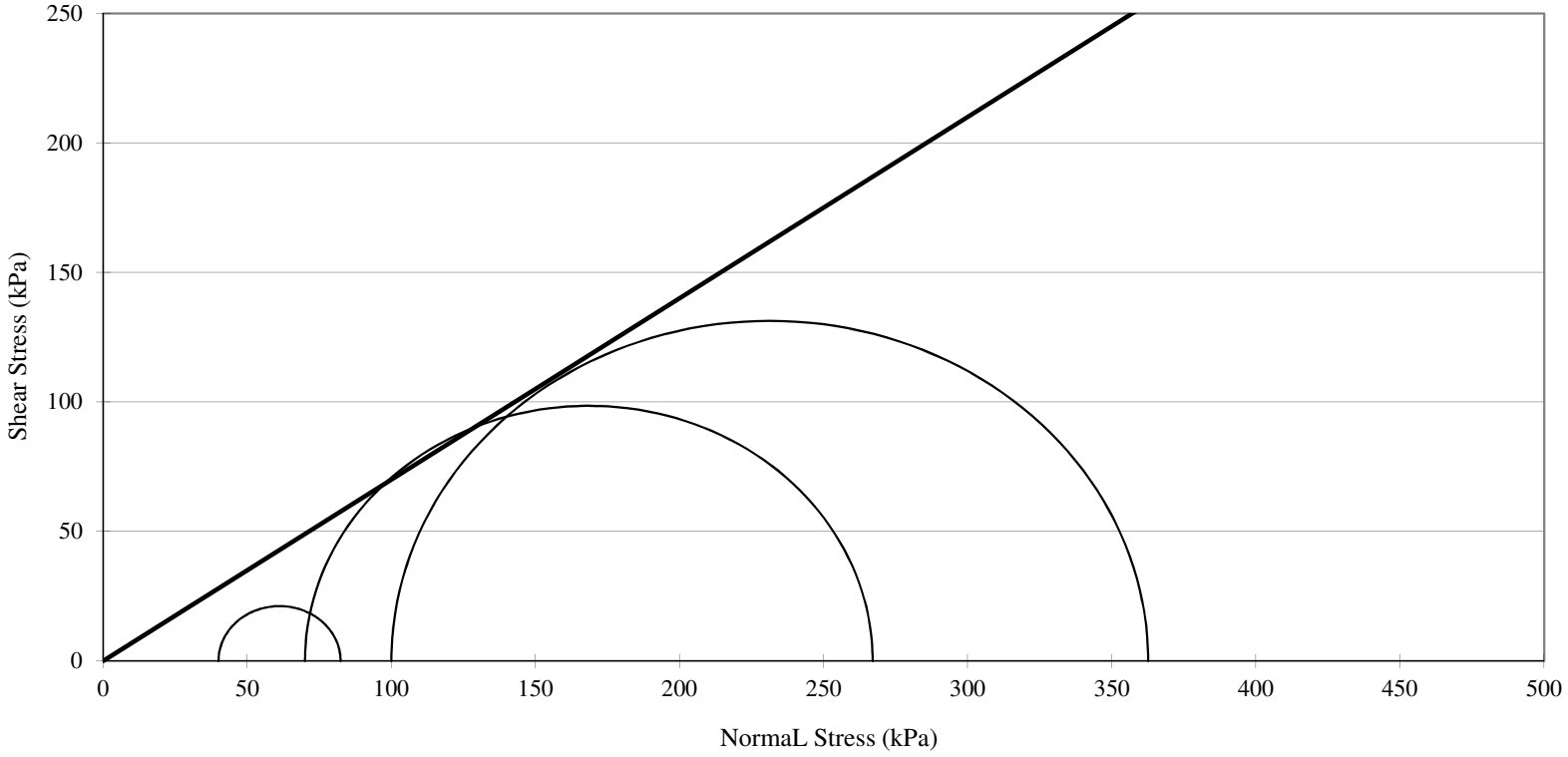


Consolidated Drained Triaxial Compression Test

- Mohr' s Circle (In terms of Total Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14

Borehole No. : LD2-11-1 Soil Type: Silty Sand
Sample No. : D-1 Depth : 14.00-14.80m
Angle of Internal Friction, ϕ 35 deg
Cohesion, c 0 kPa

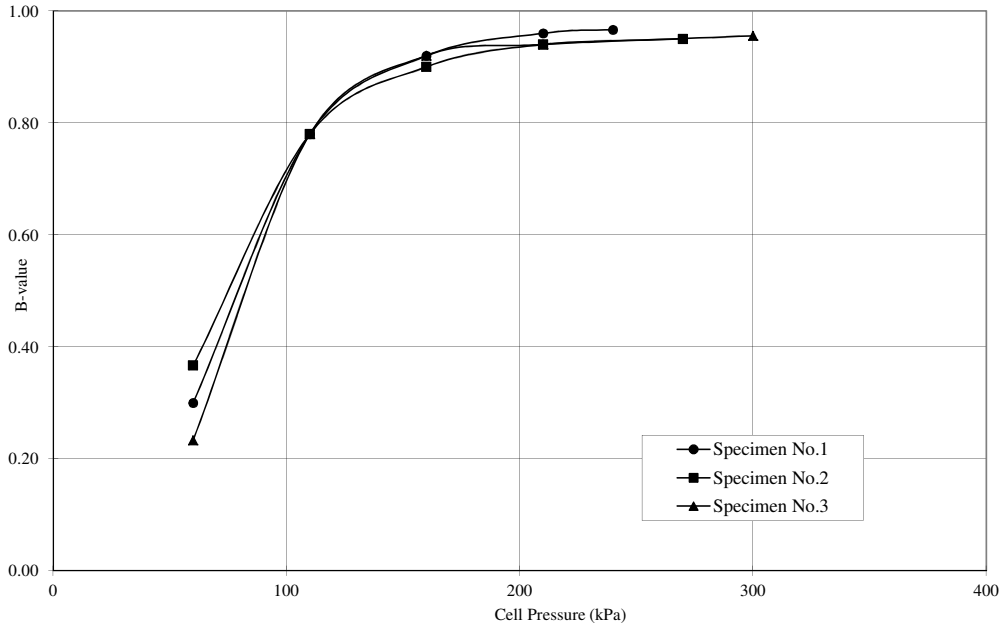


Kiso-Jiban Consultants Co., Ltd.

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

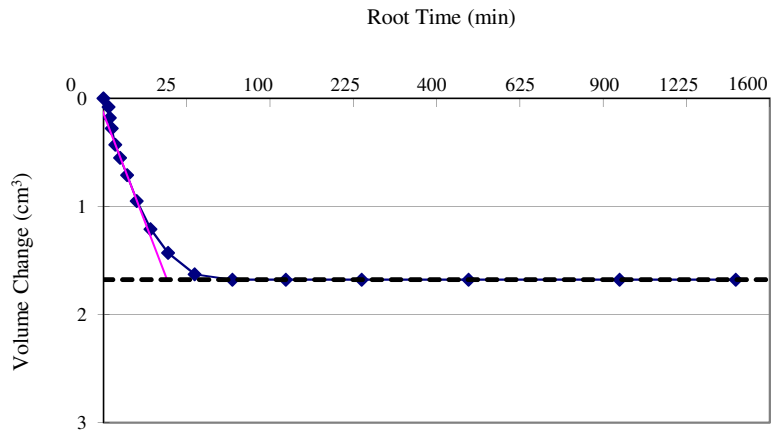
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: LD2-11-1 Depth : 14.00-14.80m
Sample No.: D-1 Soil Type: Silty Sand

		Result of B-value Check					
		Specimen 1		Specimen 2		Specimen 3	
		Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60
	P.W.P (kPa)	20	29	20	31	20	27
	Back Pressure (kPa)	20		20		20	
	B-value	0.30		0.37		0.23	
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110
	P.W.P (kPa)	50	89	50	89	50	89
	Back Pressure (kPa)	50		50		50	
	B-value	0.78		0.78		0.78	
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160
	P.W.P (kPa)	100	146	100	145	100	146
	Back Pressure (kPa)	100		100		100	
	B-value	0.92		0.90		0.92	
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210
	P.W.P (kPa)	150	198	150	197	150	197
	Back Pressure (kPa)	150		150		150	
	B-value	0.96		0.94		0.94	
B-check Step.5	Cell Pressure (kPa)	210	240	210	270	210	300
	P.W.P (kPa)	200	229	200	257	200	286
	Back Pressure (kPa)	200		200		200	
	B-value	0.97		0.95		0.96	



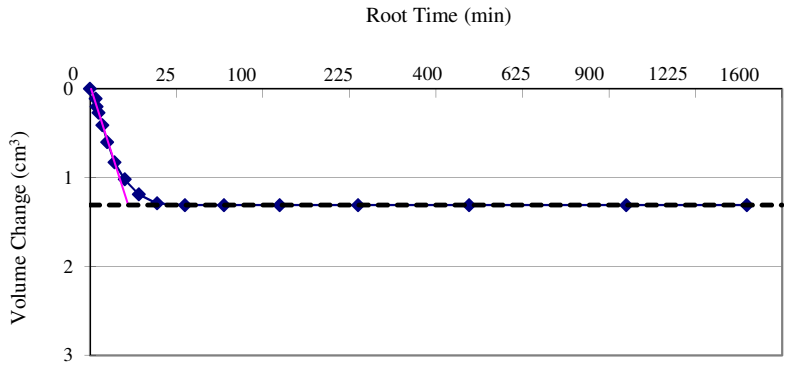
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-1 Soil Type: Silty Sand
Borehole No.: LD2-11-1 Depth : 14.00-14.80m



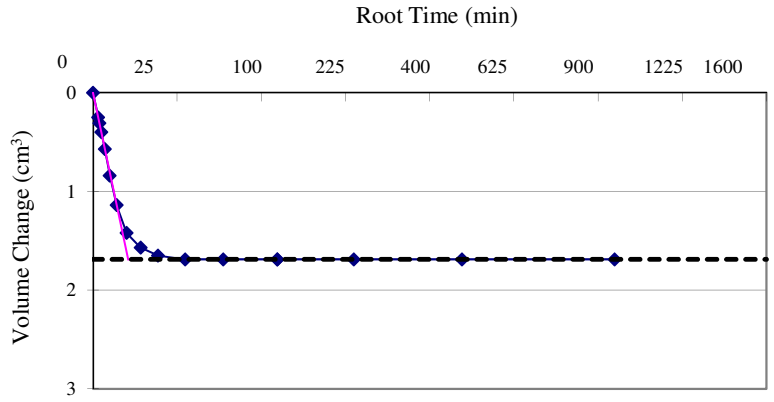
Specimen No.: 1

p' =	40	kPa
t100 =	14.6	min
Cv =	2.84	m^2/year
mvi=	0.20	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	4.8	min
Cv =	8.55	m^2/year
mvi=	0.10	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	4.4	min
Cv =	9.42	m^2/year
mvi=	0.09	m^2/MN

RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

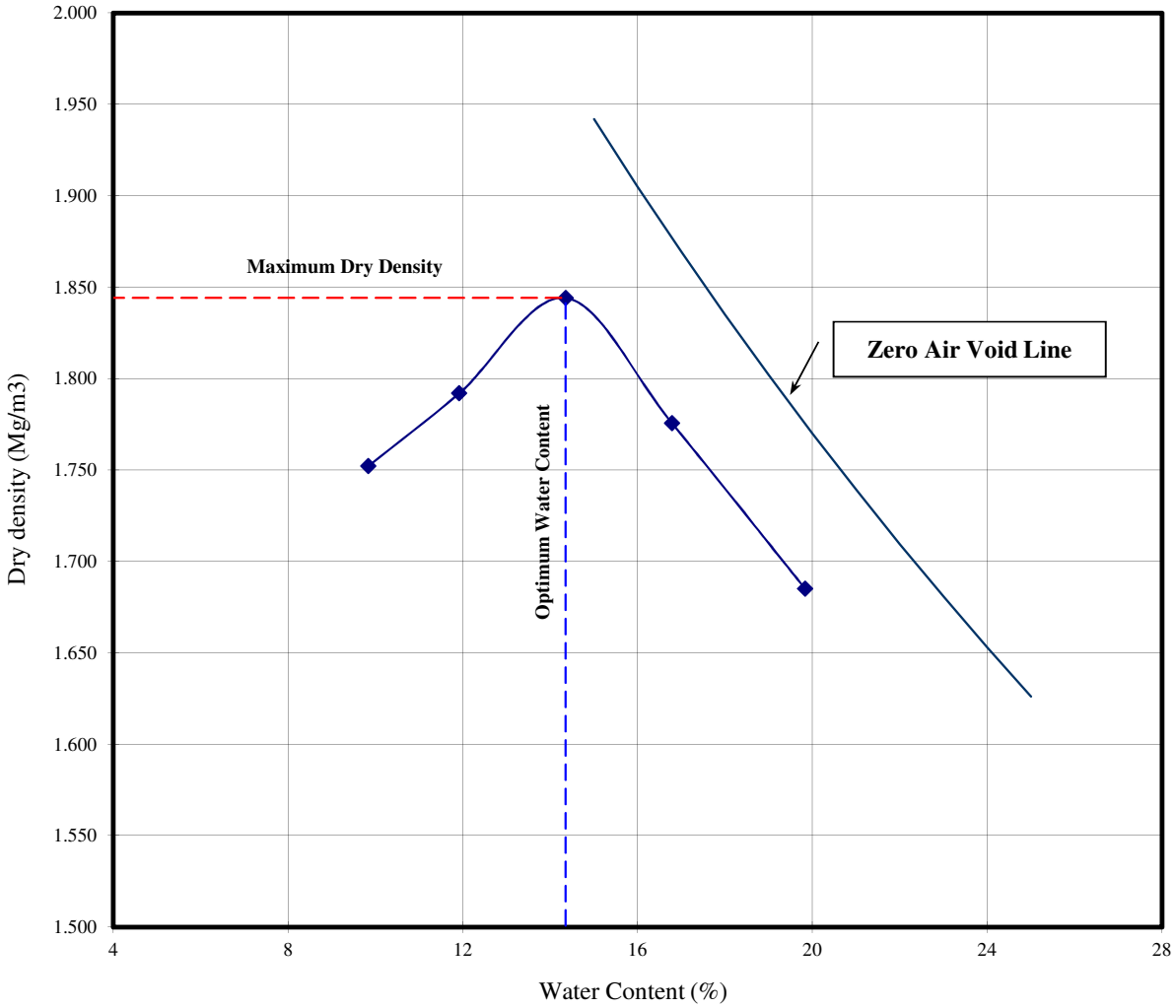
Sampling Date : - **Date of Testing :** 4-Dec-14 **Tested by :** Perera/Bala

Sample No. : LD2-11-1 D-1(14.00-14.80m) **Ref. No.** -

Soil Type :	Silty Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.74	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	9.8	11.9	14.4	16.8	19.8			
Wet Density (Mg/m3)	1.924	2.005	2.109	2.074	2.019			
Dry Density (Mg/m3)	1.752	1.792	1.844	1.776	1.685			

Maximum Dry Density	**1.844 Mg/m3**
Optimum Water Content	**14.4 %**



243

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

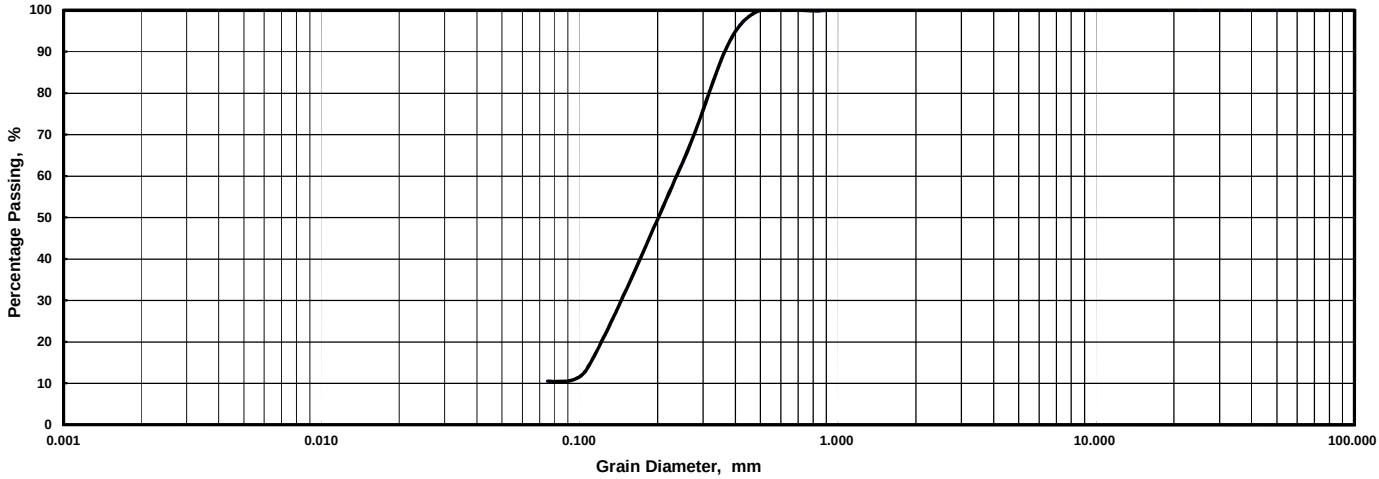
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/11/21** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-6** Depth : **9.00-9.45 m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	97.0	63.3	13.3	10.5
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.3	27.7	65.4	67.5
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	3.0	36.7	86.7	89.5

Grain Size Distribution Curves



	0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE	
		SAND			GRAVEL		

Sample No. Depth	SPT-6 9.00-9.45 m		Sample No. Depth	SPT-6 9.00-9.45 m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.24 mm	
2.00 - 0.425 mm	3.0 %		Dia. at 50%	0.20 mm	
0.425 - 0.075 mm	86.5 %		Dia. at 30%	0.14 mm	
0.075 - 0.005 mm	10.5 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	100.0 %		Coeff. of Curvature		
425um Sieve Passing	97.0 %				
75um Sieve Passing	10.5 %				

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

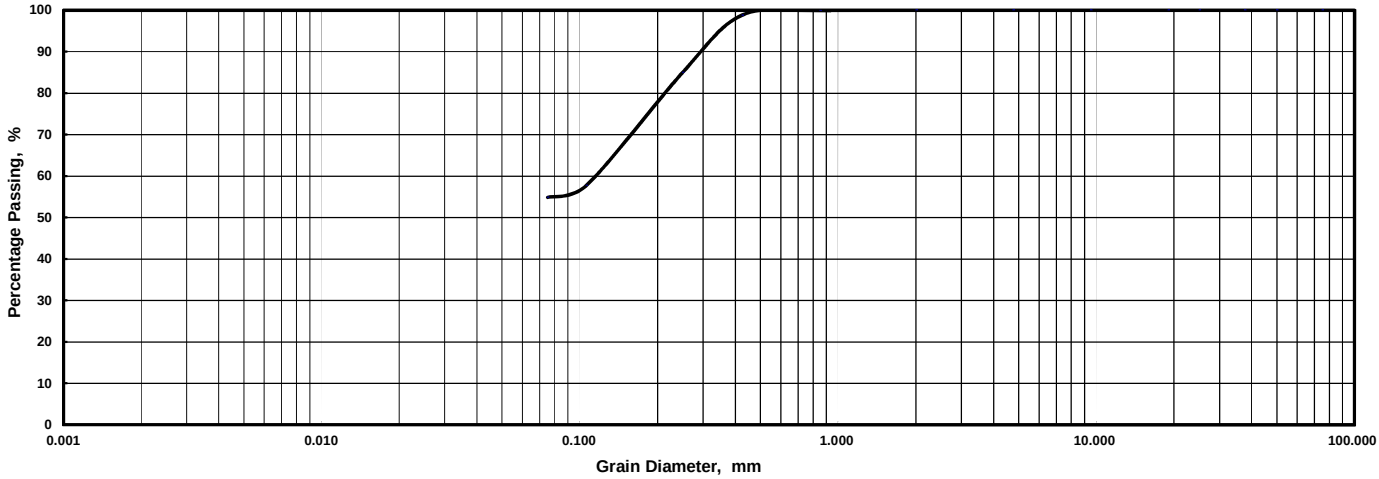
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/11/21** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-7** Depth : **10.00-10.45 m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	98.8	85.0	57.7	54.9
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	9.8	27.6	29.5
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2	15.0	42.3	45.1

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	SPT-7 10.00-10.45 m		Sample No. Depth	SPT-7 10.00-10.45 m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.11 mm	
2.00 - 0.425 mm	1.2 %		Dia. at 50%	mm	
0.425 - 0.075 mm	44.0 %		Dia. at 30%	mm	
0.075 - 0.005 mm	54.9 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	100.0 %		Coeff. of Curvature		
425um Sieve Passing	98.8 %				
75um Sieve Passing	54.9 %				

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

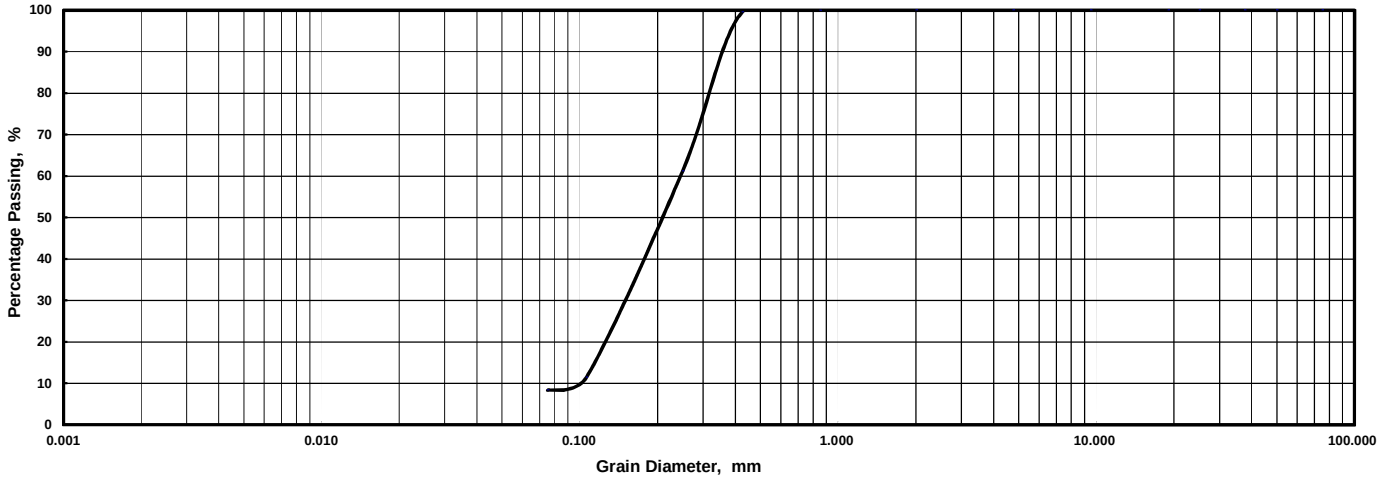
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/11/21** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-8** Depth : **12.00-12.45 m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	61.2	11.5	8.3
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	28.4	64.8	67.1
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	38.8	88.5	91.7

Grain Size Distribution Curves



	0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE	
		SAND			GRAVEL		

Sample No. Depth	SPT-8 12.00-12.45 m		Sample No. Depth	SPT-8 12.00-12.45 m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.24 mm	
2.00 - 0.425 mm	0.4 %		Dia. at 50%	0.21 mm	
0.425 - 0.075 mm	91.2 %		Dia. at 30%	0.15 mm	
0.075 - 0.005 mm	8.3 %		Dia. at 10%	0.090 mm	
Smaller than 0.005 mm			Coeff. of Uniformity	2.72	
2000um Sieve Passing	100.0 %		Coeff. of Curvature	0.96	
425um Sieve Passing	99.6 %				
75um Sieve Passing	8.3 %				

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

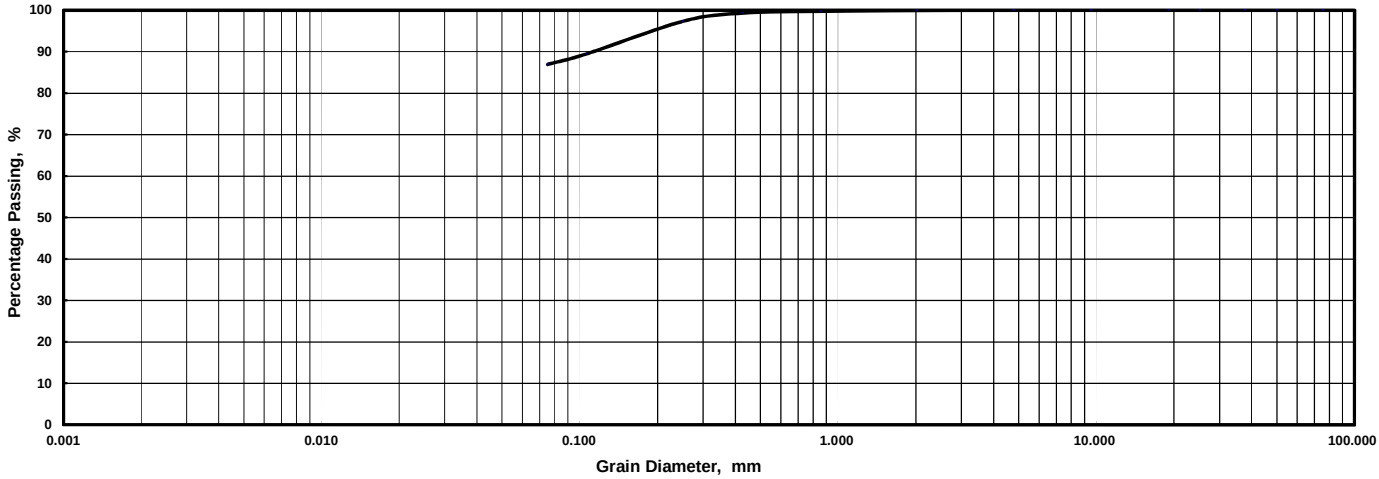
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/9/29** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-9** Depth : **13.00-13.45m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.7	99.3	97.3	89.5	86.9
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	1.8	7.0	8.7
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.7	2.7	10.5	13.1

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	SPT-9 13.00-13.45m		Sample No. Depth	SPT-9 13.00-13.45m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.1 %		Dia. at 60%	mm	
2.00 - 0.425 mm	0.6 %		Dia. at 50%	mm	
0.425 - 0.075 mm	12.4 %		Dia. at 30%	mm	
0.075 - 0.005 mm	86.9 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	99.9 %		Coeff. of Curvature		
425um Sieve Passing	99.3 %				
75um Sieve Passing	86.9 %				

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

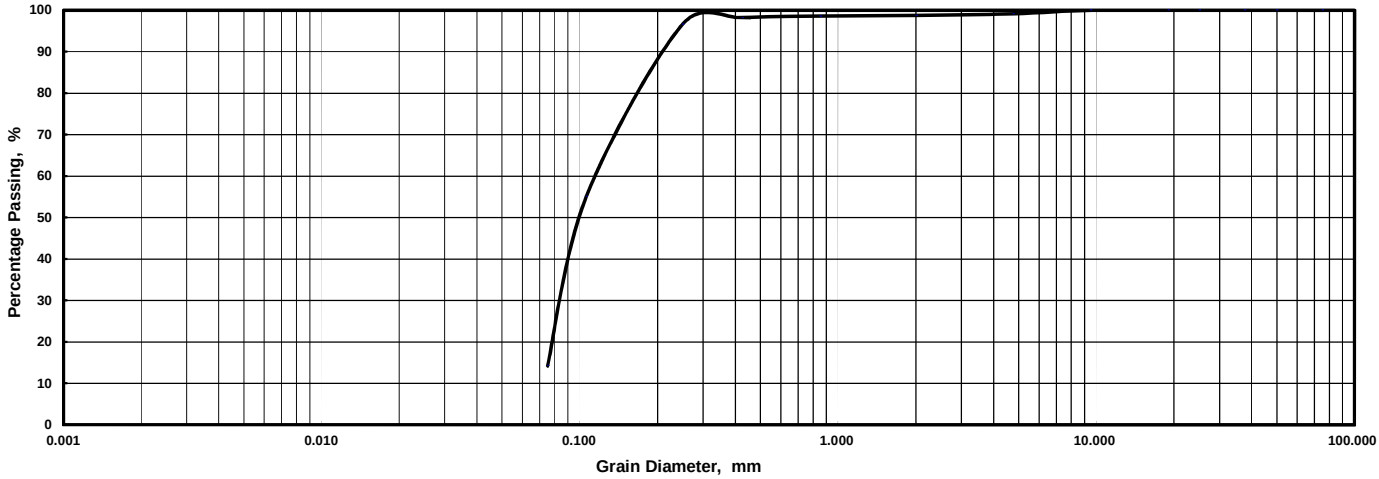
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/9/26** Tested By : **Sadamoto** Checked by :

Sample No. : **D-1** Depth : **14.00-14.80m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	99.1	98.7	98.6	98.2	96.6	55.1	14.2
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.1	1.3	1.6	3.0	40.2	76.7
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.3	1.4	1.8	3.4	44.9	85.8

Grain Size Distribution Curves



	0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY		FINE	MEDIUM	COARSE	FINE	COARSE	
	SILT	SAND			GRAVEL		

Sample No. Depth	D-1 14.00-14.80m		Sample No. Depth	D-1 14.00-14.80m	
Larger than 4.75 mm	0.9 %		Max. Diameter	9.50 mm	
4.75 - 2.00 mm	0.4 %		Dia. at 60%	0.12 mm	
2.00 - 0.425 mm	0.5 %		Dia. at 50%	0.10 mm	
0.425 - 0.075 mm	84.0 %		Dia. at 30%	0.09 mm	
0.075 - 0.005 mm	14.2 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	98.7 %		Coeff. of Curvature		
425um Sieve Passing	98.2 %				
75um Sieve Passing	14.2 %				

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

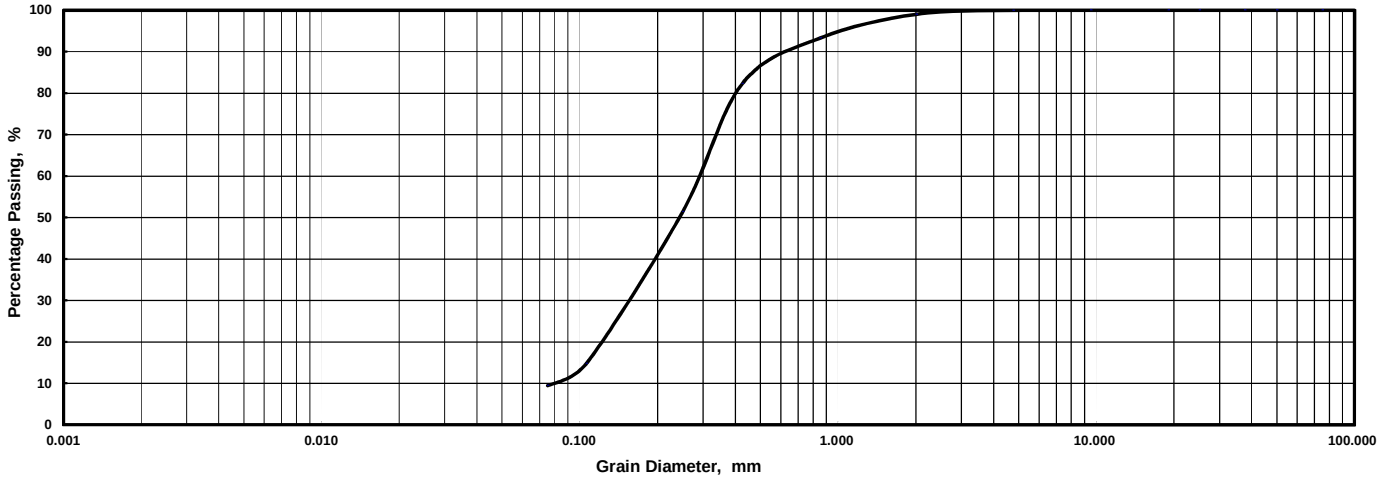
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/9/29** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-10** Depth : **15.00-15.45m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.0	93.3	82.2	51.4	14.8	9.4
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	6.0	15.7	43.0	75.4	80.1
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	6.7	17.8	48.6	85.2	90.6

Grain Size Distribution Curves



	0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE	
		SAND			GRAVEL		

Sample No. Depth	SPT-10 15.00-15.45m		Sample No. Depth	SPT-10 15.00-15.45m	
Larger than 4.75 mm	0.1 %		Max. Diameter	9.50 mm	
4.75 - 2.00 mm	0.9 %		Dia. at 60%	0.29 mm	
2.00 - 0.425 mm	16.8 %		Dia. at 50%	0.24 mm	
0.425 - 0.075 mm	72.8 %		Dia. at 30%	0.15 mm	
0.075 - 0.005 mm	9.4 %		Dia. at 10%	0.078 mm	
Smaller than 0.005 mm			Coeff. of Uniformity	3.73	
2000um Sieve Passing	99.0 %		Coeff. of Curvature	1.02	
425um Sieve Passing	82.2 %				
75um Sieve Passing	9.4 %				

Kiso-Jiban Consultants Co., Ltd.

249

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

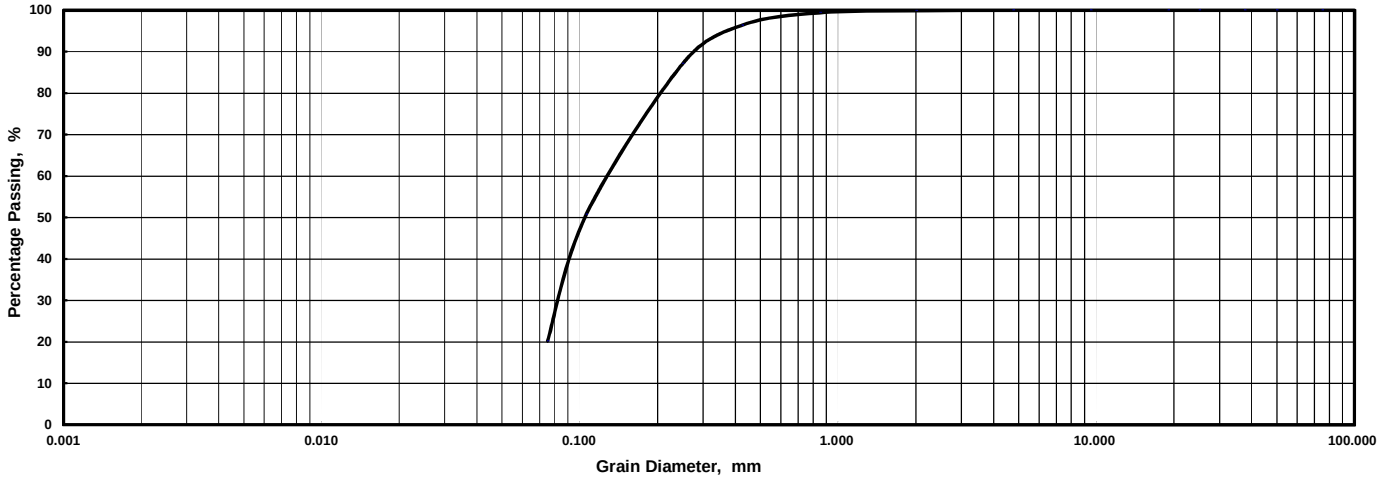
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/9/29** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-11** Depth : **16.00-16.45m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.4	96.4	87.1	50.8	20.2
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	2.1	7.4	28.3	45.8
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	3.6	12.9	49.2	79.8

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE			FINE / COARSE	
		SAND			GRAVEL	

Sample No. Depth	SPT-11 16.00-16.45m		Sample No. Depth	SPT-11 16.00-16.45m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.1 %		Dia. at 60%	0.13 mm	
2.00 - 0.425 mm	3.5 %		Dia. at 50%	0.11 mm	
0.425 - 0.075 mm	76.2 %		Dia. at 30%	0.08 mm	
0.075 - 0.005 mm	20.2 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	99.9 %		Coeff. of Curvature		
425um Sieve Passing	96.4 %				
75um Sieve Passing	20.2 %				

Kiso-Jiban Consultants Co., Ltd.

250

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

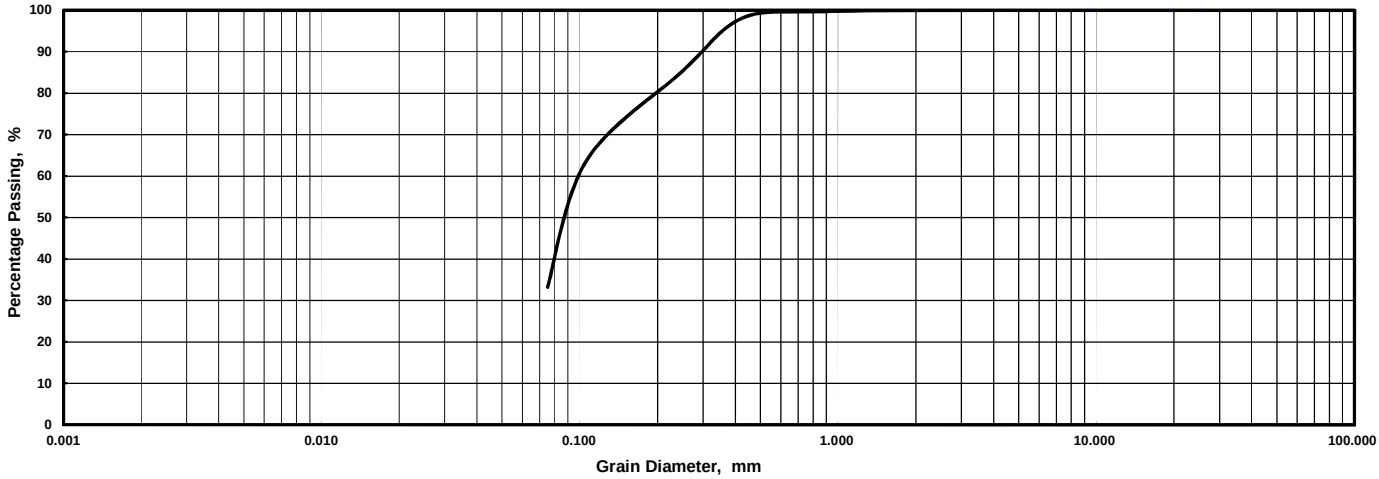
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/9/29** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-12** Depth : **18.00-18.45m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.6	98.1	85.3	63.7	33.2
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.9	14.6	36.2	66.6
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.9	14.7	36.3	66.8

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE / COARSE	GRAVEL	

Sample No. / Depth	SPT-12 / 18.00-18.45m		Sample No. / Depth	SPT-12 / 18.00-18.45m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.1 %		Dia. at 60%	0.10 mm	
2.00 - 0.425 mm	1.8 %		Dia. at 50%	0.09 mm	
0.425 - 0.075 mm	64.9 %		Dia. at 30%	mm	
0.075 - 0.005 mm	33.2 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	99.9 %		Coeff. of Curvature		
425um Sieve Passing	98.1 %				
75um Sieve Passing	33.2 %				

Kiso-Jiban Consultants Co., Ltd.

251

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

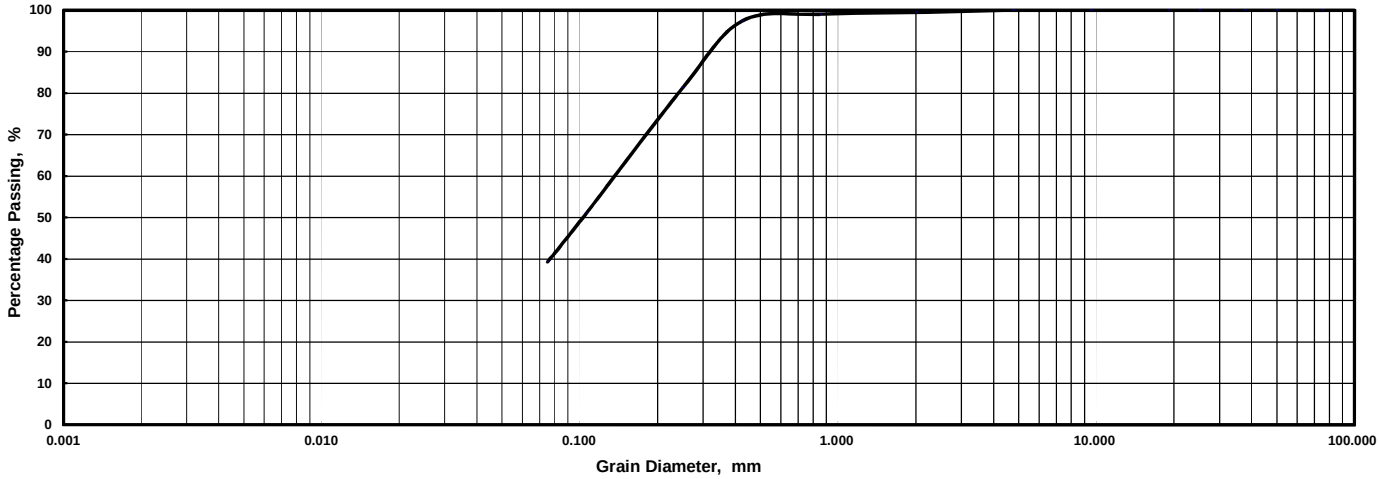
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/9/29** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-13** Depth : **19.00-19.45m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.5	99.0	97.4	81.3	51.1	39.3
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	2.0	14.3	37.4	46.4
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	2.6	18.7	48.9	60.7

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	SPT-13 19.00-19.45m		Sample No. Depth	SPT-13 19.00-19.45m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.5 %		Dia. at 60%	0.14 mm	
2.00 - 0.425 mm	2.1 %		Dia. at 50%	0.10 mm	
0.425 - 0.075 mm	58.1 %		Dia. at 30%	mm	
0.075 - 0.005 mm	39.3 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	99.5 %		Coeff. of Curvature		
425um Sieve Passing	97.4 %				
75um Sieve Passing	39.3 %				

Kiso-Jiban Consultants Co., Ltd.

252

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

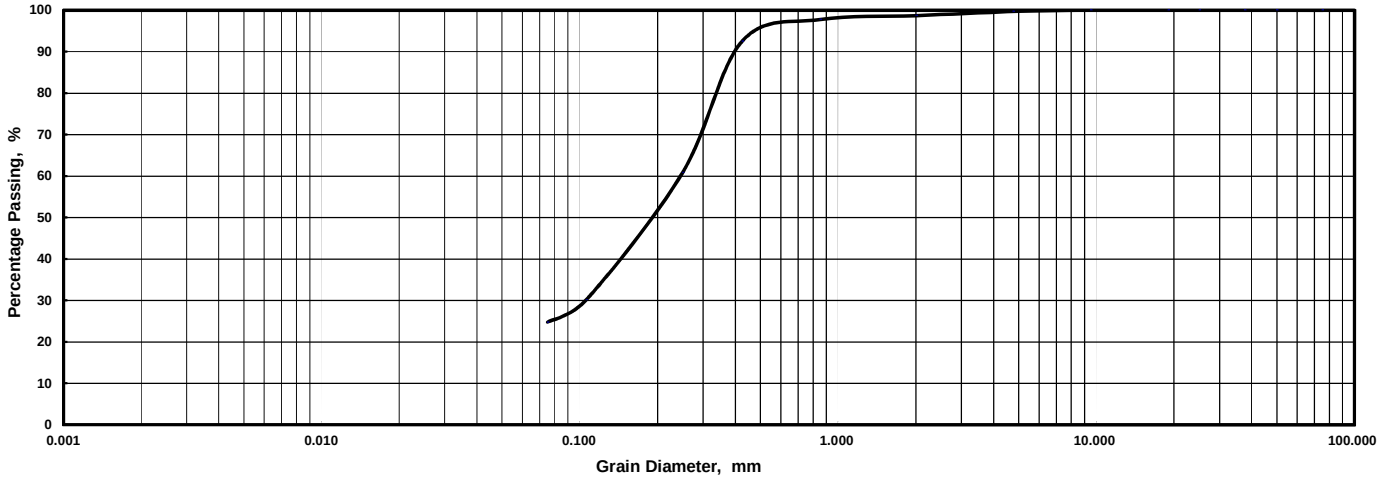
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/9/17** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-17** Depth : **24.00-24.45m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	99.7	98.7	97.8	92.5	60.8	30.2	24.8
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.3	2.2	7.3	38.2	68.1	73.4
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.3	2.2	7.5	39.2	69.8	75.2

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. / Depth	SPT-17 / 24.00-24.45m		Sample No. / Depth	SPT-17 / 24.00-24.45m	
Larger than 4.75 mm	0.3 %		Max. Diameter	9.50 mm	
4.75 - 2.00 mm	1.0 %		Dia. at 60%	0.24 mm	
2.00 - 0.425 mm	6.2 %		Dia. at 50%	0.18 mm	
0.425 - 0.075 mm	67.8 %		Dia. at 30%	0.10 mm	
0.075 - 0.005 mm	24.8 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	98.7 %		Coeff. of Curvature		
425um Sieve Passing	92.5 %				
75um Sieve Passing	24.8 %				

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

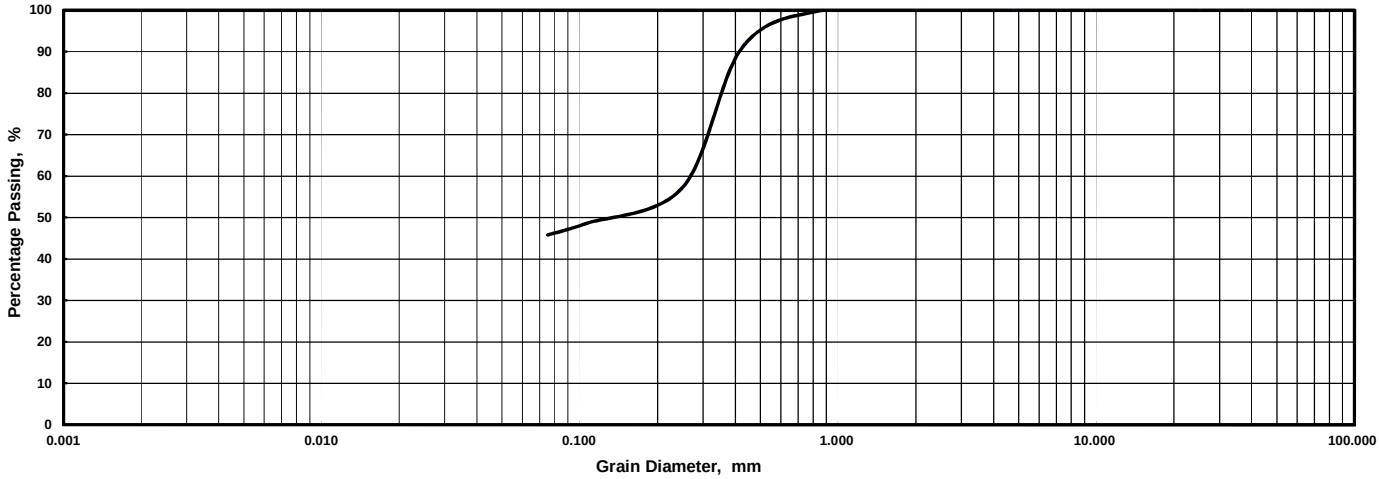
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/9/17** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-18** Depth : **25.00-25.45m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	91.0	57.3	48.6	45.8
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	7.8	37.1	44.6	47.1
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	9.0	42.7	51.4	54.2

Grain Size Distribution Curves



	0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE	
		SAND			GRAVEL		

Sample No. Depth	SPT-18 25.00-25.45m		Sample No. Depth	SPT-18 25.00-25.45m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.26 mm	
2.00 - 0.425 mm	9.0 %		Dia. at 50%	0.12 mm	
0.425 - 0.075 mm	45.2 %		Dia. at 30%	mm	
0.075 - 0.005 mm	45.8 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	100.0 %		Coeff. of Curvature		
425um Sieve Passing	91.0 %				
75um Sieve Passing	45.8 %				

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

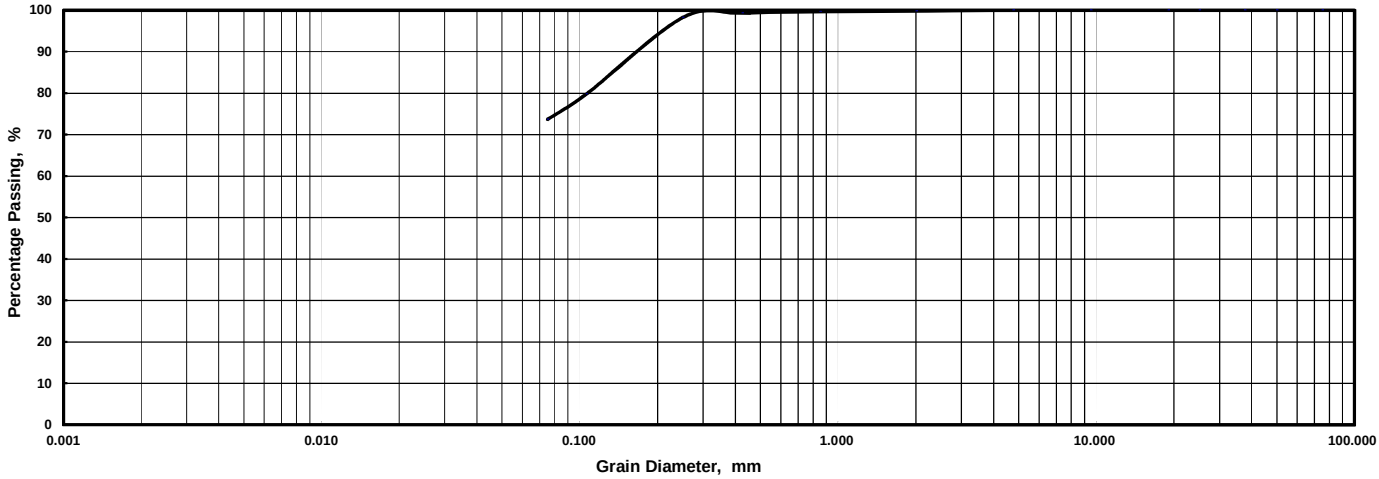
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/9/17** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-19** Depth : **26.00-26.45m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.6	99.3	98.2	79.8	73.7
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.6	1.5	17.3	22.6
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.7	1.8	20.2	26.3

Grain Size Distribution Curves



	0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE	
		SAND			GRAVEL		

Sample No. Depth	SPT-19 26.00-26.45m		Sample No. Depth	SPT-19 26.00-26.45m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.2 %		Dia. at 60%	mm	
2.00 - 0.425 mm	0.5 %		Dia. at 50%	mm	
0.425 - 0.075 mm	25.6 %		Dia. at 30%	mm	
0.075 - 0.005 mm	73.7 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	99.8 %		Coeff. of Curvature		
425um Sieve Passing	99.3 %				
75um Sieve Passing	73.7 %				

Kiso-Jiban Consultants Co., Ltd.

255

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

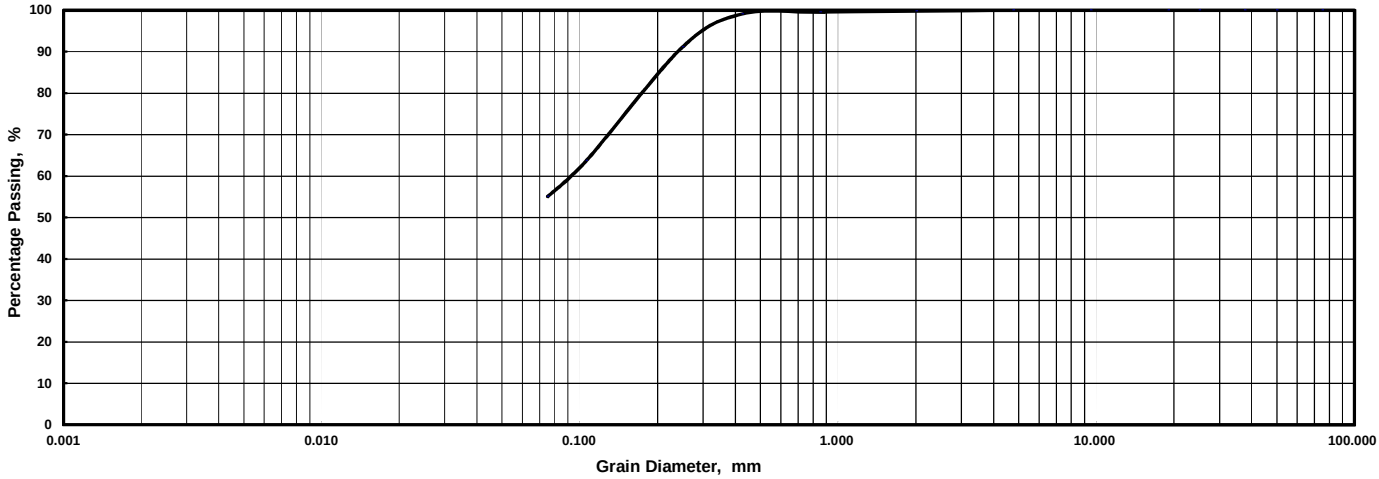
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/9/17** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-20** Depth : **27.00-27.45m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.6	99.1	91.2	63.7	55.0
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.6	6.3	25.9	32.1
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.9	8.8	36.3	45.0

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. / Depth	SPT-20 / 27.00-27.45m		Sample No. / Depth	SPT-20 / 27.00-27.45m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.2 %		Dia. at 60%	0.09 mm	
2.00 - 0.425 mm	0.7 %		Dia. at 50%	mm	
0.425 - 0.075 mm	44.1 %		Dia. at 30%	mm	
0.075 - 0.005 mm	55.0 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	99.8 %		Coeff. of Curvature		
425um Sieve Passing	99.1 %				
75um Sieve Passing	55.0 %				

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

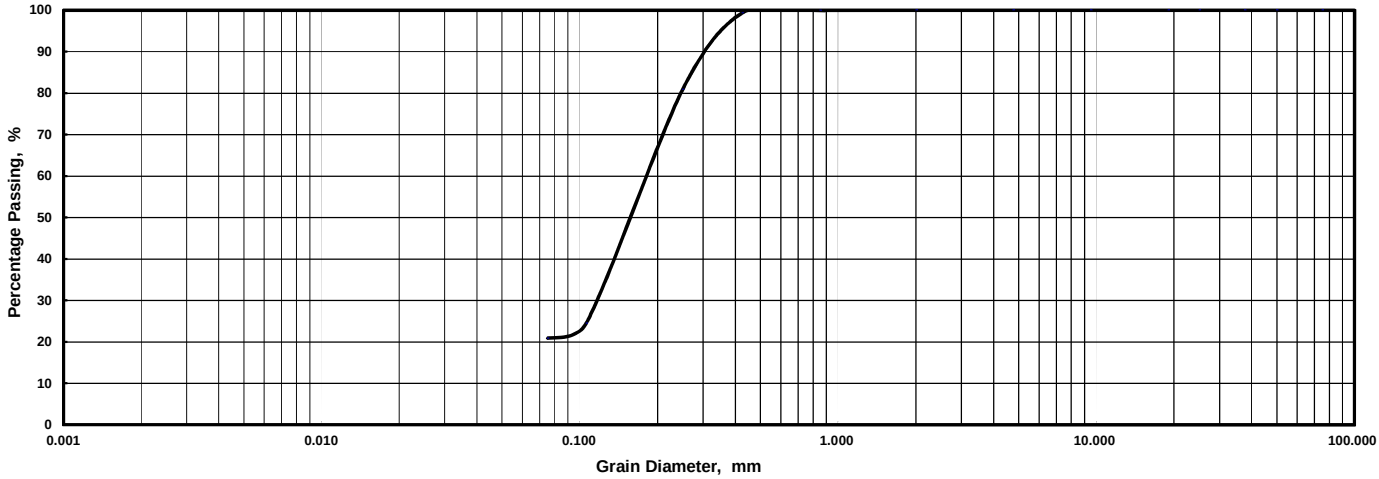
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/9/17** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-21** Depth : **28.00-28.45m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.3	80.9	24.5	20.9
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	15.8	62.5	65.5
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	19.1	75.5	79.1

Grain Size Distribution Curves



	0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE	
		SAND			GRAVEL		

Sample No. Depth	SPT-21 28.00-28.45m		Sample No. Depth	SPT-21 28.00-28.45m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.18 mm	
2.00 - 0.425 mm	0.7 %		Dia. at 50%	0.16 mm	
0.425 - 0.075 mm	78.4 %		Dia. at 30%	0.12 mm	
0.075 - 0.005 mm	20.9 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	100.0 %		Coeff. of Curvature		
425um Sieve Passing	99.3 %				
75um Sieve Passing	20.9 %				

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

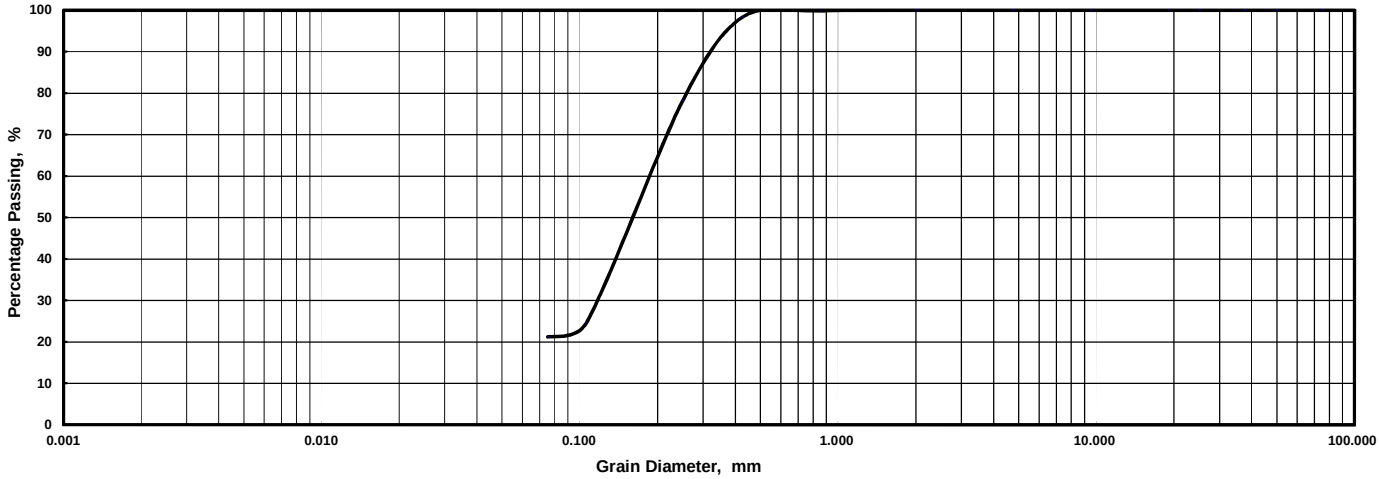
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/9/17** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-22** Depth : **29.00-29.45m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	98.3	78.1	24.6	21.2
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	10.8	37.2	38.8
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.7	21.9	75.4	78.8

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE / COARSE	GRAVEL	

Sample No. / Depth	SPT-22 / 29.00-29.45m		Sample No. / Depth	SPT-22 / 29.00-29.45m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.19 mm	
2.00 - 0.425 mm	1.7 %		Dia. at 50%	0.16 mm	
0.425 - 0.075 mm	77.1 %		Dia. at 30%	0.12 mm	
0.075 - 0.005 mm	21.2 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	100.0 %		Coeff. of Curvature		
425um Sieve Passing	98.3 %				
75um Sieve Passing	21.2 %				

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

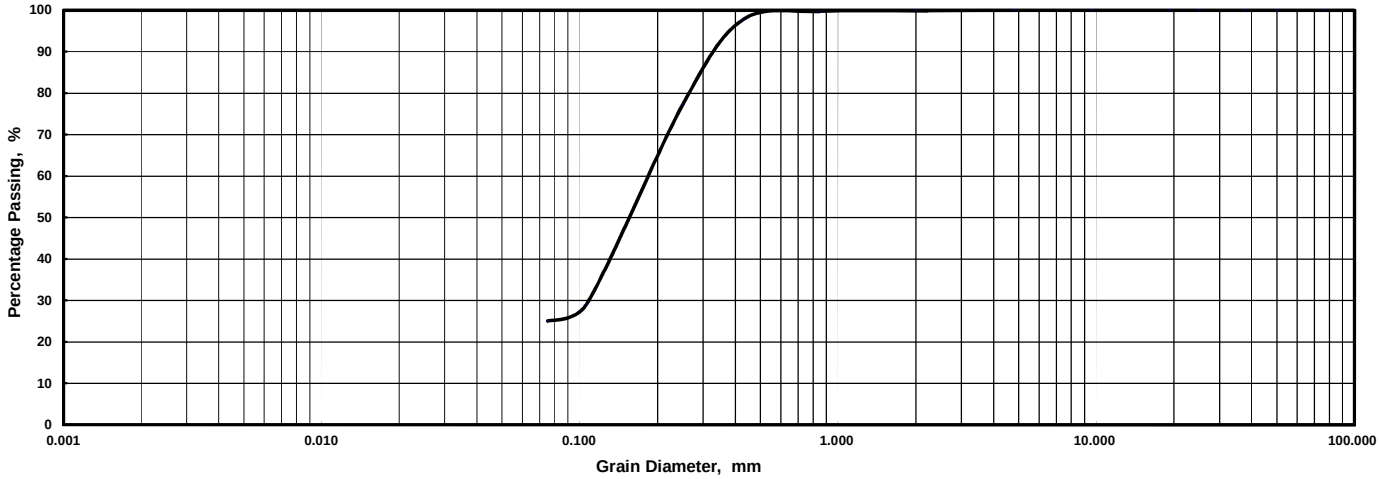
Location : **LD 2-11-1** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/9/17** Tested By : **Sadamoto** Checked by :

Sample No. : **SPT-23** Depth : **30.00-30.45m** ( ) Particle Density, Mg/m^3 : -

Sieve	Dia., mm	75.0	50.00	37.50	25.00	19.00	9.50	4.75	2.000	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.7	97.6	77.2	29.0	25.0
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.4	13.0	40.4	42.6
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	2.4	22.8	71.0	75.0

Grain Size Distribution Curves



	0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE	
		SAND			GRAVEL		

Sample No. Depth	SPT-23 30.00-30.45m		Sample No. Depth	SPT-23 30.00-30.45m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.1 %		Dia. at 60%	0.18 mm	
2.00 - 0.425 mm	2.3 %		Dia. at 50%	0.15 mm	
0.425 - 0.075 mm	72.6 %		Dia. at 30%	0.11 mm	
0.075 - 0.005 mm	25.0 %		Dia. at 10%	mm	
Smaller than 0.005 mm			Coeff. of Uniformity		
2000um Sieve Passing	99.9 %		Coeff. of Curvature		
425um Sieve Passing	97.6 %				
75um Sieve Passing	25.0 %				

19) LD2-11-1a

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.		LD2-11-1a								
Sample No.		HP-1	HP-2	HP-3	D-1	D-2	D-3	D-4		
Sample Depth		2.00m ~2.85m	5.00m ~5.90m	8.00m ~8.90m	11.00m ~11.80m	14.00m ~14.60m	17.00m ~17.80m	20.00m ~20.70m		
Condition of Sample		Undisturbed			Disturbed					
Natural Water Content	%	30.2	30.8	36.4	26.4	27.7	22.8	25.6		
Specific Gravity		2.73	2.73	2.74	2.70	2.69	2.68	2.71		
Wet Density	Mg/m^3	1.89	1.91	1.82	1.96	-	-	1.94		
Dry Density	Mg/m^3	1.45	1.46	1.34	1.55	-	-	1.54		
Natural Void Ratio		0.88	0.87	1.05	0.74	-	-	0.75		
Degree of Saturation	%	94	97	95	96	-	-	92		
Atterberg Limits	Liquid Limit, %	- *3	28	38	- *3	- *3	- *3	25		
	Plastic Limit, %	- *3	22	21	- *3	- *3	- *3	14		
	Plasticity Index, %	- *3	6	17	- *3	- *3	- *3	11		
Grain Size Analysis	Gravel, %	0	0	0	0	0	0	0		
	Sand, %	18	34	12	58	80	76	48		
	Silt, %	56	39	45	17	8	8	24		
	Clay & Colloid, %	26	27	43	25	12	16	28		
	Max. diameter, mm	0.850	0.425	2.00	0.850	0.425	4.75	4.75		
	Diam. at 60% mm	0.044	0.055	0.014	0.14	0.16	0.27	0.20		
	Diam. at 10% mm	-	-	-	-	-	-	-		
Visual soil description		Clayey Silt	Sandy Silt	Clay with Sand	Clayey Sand	Clayey Sand	Clayey Sand	Sandy Clay		
Unified soil classification		-	ML	CL	-	-	-	CL		
Triaxial compression test	Angle of Internal Friction (^{0})	-	-	-	-	-	-	-		
	Cohesion Intercept, kPa	-	-	-	-	-	-	-		
	Condition of drainage	-	-	-	-	-	-	-		
	Angle of Internal Friction *2 (^{0})	-	-	-	-	36	-	-		
	Cohesion Intercept, kPa *2	-	-	-	-	0	-	-		
	Condition of drainage	-	-	-	-	CD*5	-	-		
Consolidation Test	Preconsolidation Pressure, kPa	-	-	-	-	-	-	-		
	Compression Index(Average)	-	-	-	-	-	-	-		
	Pressure Range for Compression Index(kPa)	-	-	-	-	-	-	-		
	Swell index	-	-	-	-	-	-	-		
Compaction Test *4	Maximum Dry Density, Mg/m^3	-	-	-	-	1.60	-	-		
	Optimum Moisture Content , %	-	-	-	-	17.8	-	-		
Unconfined Compression Strength (kPa)		-	-	-	-	-	-	-		
Strain at failure (%)		-	-	-	-	-	-	-		

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

*4 : By using 2.5 kg Rammer *5 : Specimens are prepared at 90% of Maximum dry density

Checked by : A. B. Tan

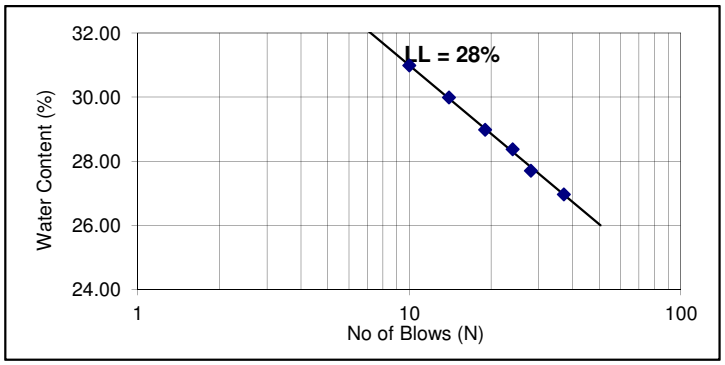
Kiso-Jiban Consultants Co., Ltd.

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14
Standard : ASTM D4318-10
Date of Testing : 04.12.14
Tested By : Vasantha
Checked By : A. B. Tan

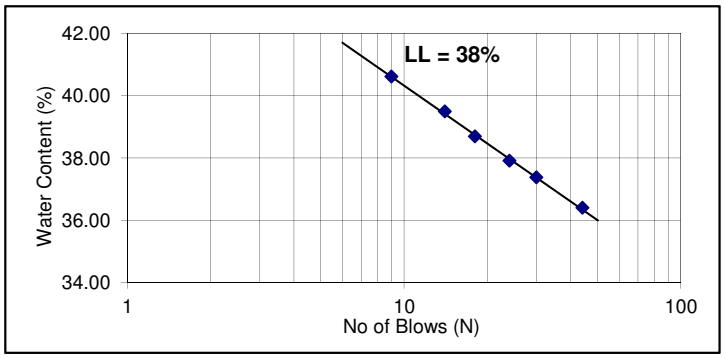
Sample No. : LD2-11-1a HP-2
Depth : 5.00-5.90m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	37	26.96
2	28	27.71
3	24	28.37
4	19	28.98
5	14	29.98
6	10	30.99
Liquid Limits %		**28**
Plastic Limits %		**22**
Plasticity Index		**6**



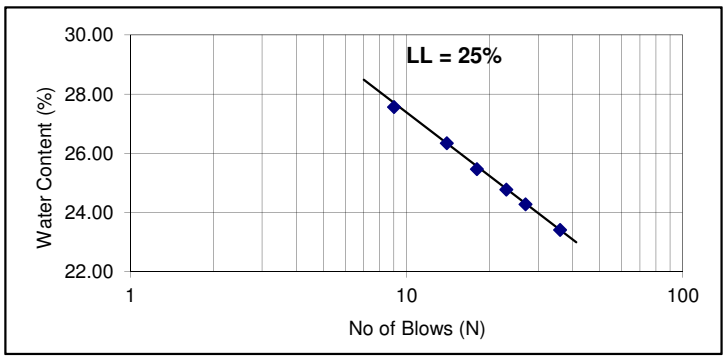
Sample No. : LD2-11-1a HP-3
Depth : 8.00-8.90m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	44	36.40
2	30	37.38
3	24	37.91
4	18	38.69
5	14	39.49
6	9	40.61
Liquid Limits %		**38**
Plastic Limits %		**21**
Plasticity Index		**17**



Sample No. : LD2-11-1a D-4
Depth : 20.00-20.70m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	36	23.42
2	27	24.28
3	23	24.78
4	18	25.47
5	14	26.34
6	9	27.56
Liquid Limits %		**25**
Plastic Limits %		**14**
Plasticity Index		**11**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

263

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **01.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

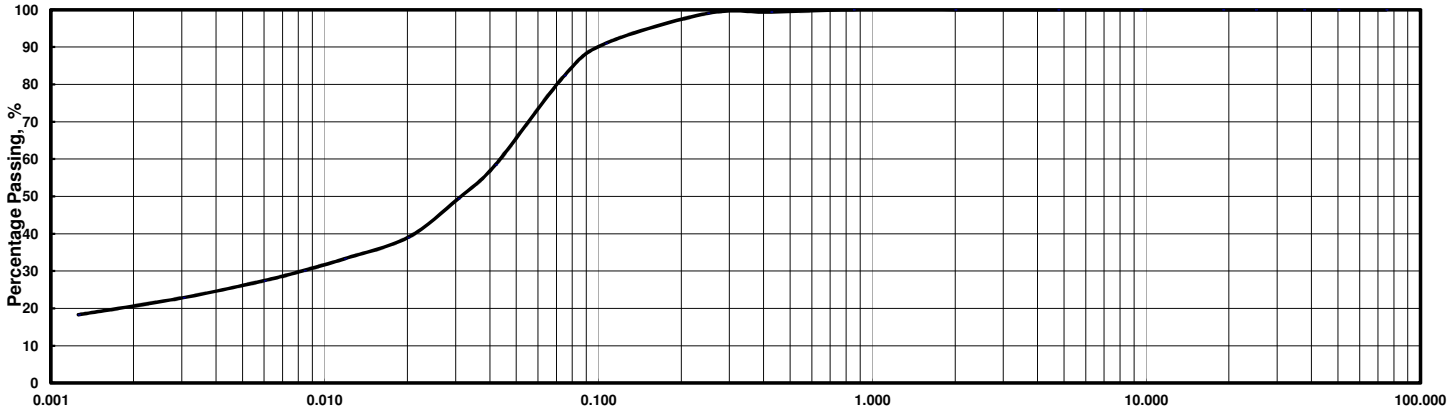
Sample No. : **LD2-11-1a HP-1** Depth : **2.00-2.85m** ( ) Specific Gravity : 2.73

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	99.0	91.0	82.4
Hydro.	Dia., mm	0.042	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0013							
	% Passing	58.6	49.4	39.0	33.3	30.2	27.4	22.9	18.3							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	LD2-11-1a HP-1 2.00-2.85m			Sample No. Depth	LD2-11-1a HP-1 2.00-2.85m		
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.044	mm	
2.00 - 0.425 mm	0.6	%		Dia. at 30%	0.0082	mm	
0.425 - 0.075 mm	17.0	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	56.5	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	25.9	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	100.0	%					
75um Sieve Passing	82.4	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **01.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

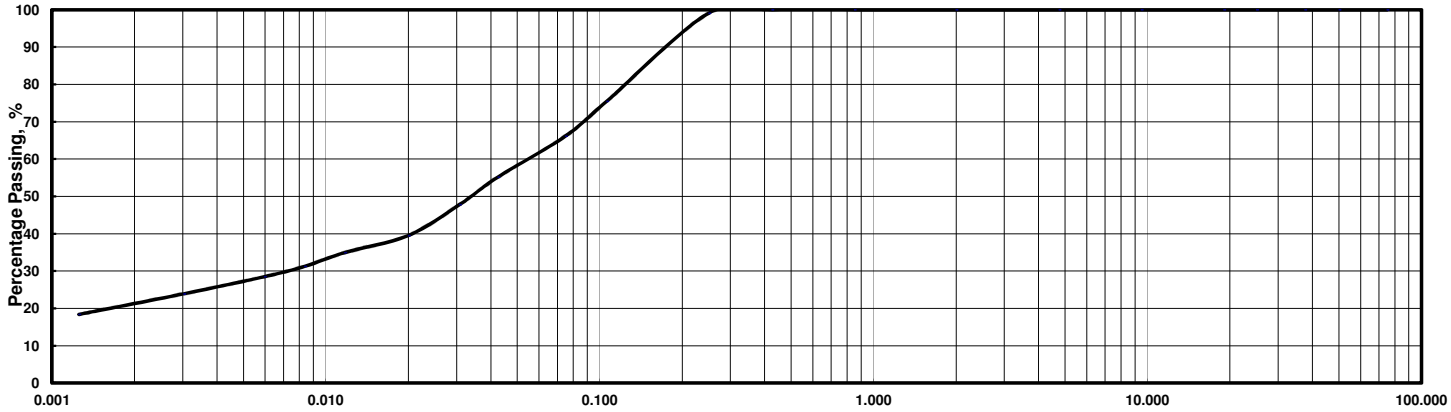
Sample No. : **LD2-11-1a HP-2** Depth : **5.00-5.90m** ( ) Specific Gravity : 2.73

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1	75.5	66.2
Hydro.	Dia., mm	0.042	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0013							
	% Passing	55.2	47.8	39.5	34.9	31.3	28.5	23.9	18.4							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1a HP-2 5.00-5.90m			Sample No. Depth	LD2-11-1a HP-2 5.00-5.90m		
Larger than 4.75 mm	0.0	%		Max. Diameter	0.425	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.055	mm	
2.00 - 0.425 mm	0.0	%		Dia. at 30%	0.0072	mm	
0.425 - 0.075 mm	33.8	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	39.2	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	27.0	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	100.0	%					
75um Sieve Passing	66.2	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **01.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

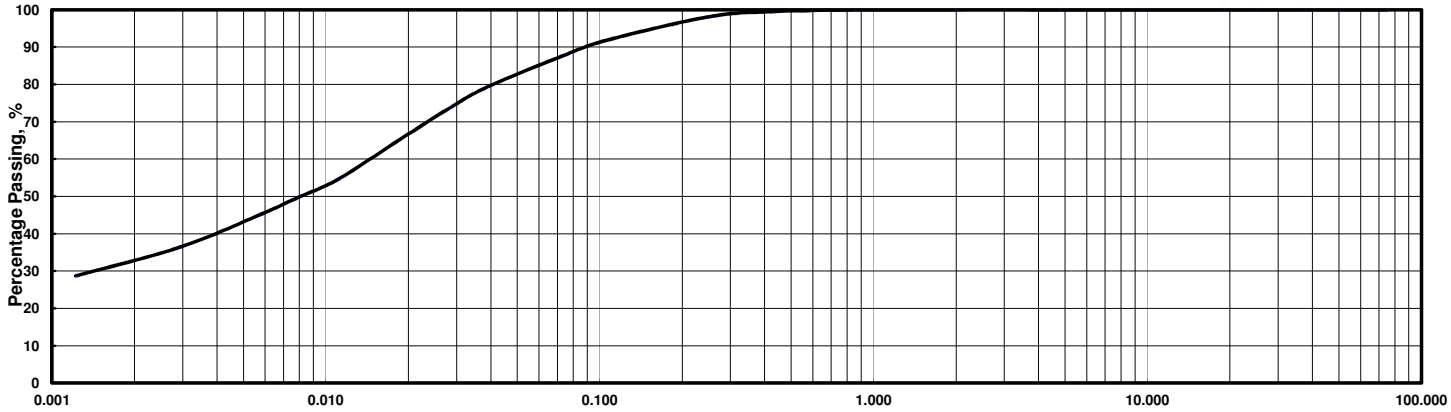
Sample No. : **LD2-11-1a HP-3** Depth : **8.00-8.90m** ( ) Specific Gravity : 2.74

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.5	98.1	91.8	87.9
Hydro.	Dia., mm	0.039	0.028	0.018	0.011	0.0079	0.0057	0.0029	0.0012							
	% Passing	79.4	73.7	65.1	54.5	49.8	45.0	36.4	28.7							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	LD2-11-1a HP-3 8.00-8.90m			Sample No. Depth	LD2-11-1a HP-3 8.00-8.90m		
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.014	mm	
2.00 - 0.425 mm	0.5	%		Dia. at 30%	0.0014	mm	
0.425 - 0.075 mm	11.5	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	45.1	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	42.8	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.9	%					
75um Sieve Passing	87.9	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **01.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

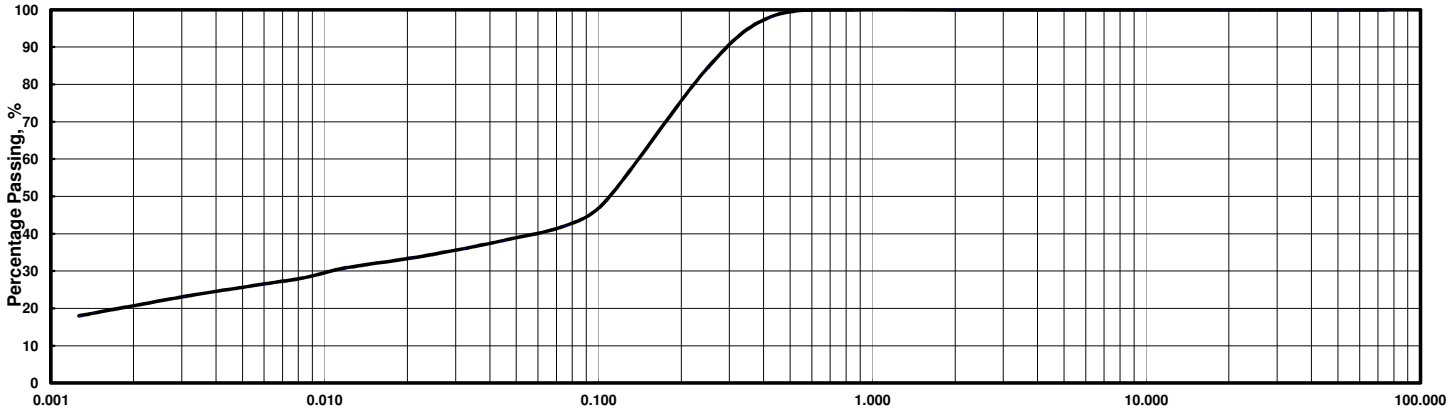
Sample No. : **LD2-11-1a D-1** Depth : **11.00-11.80m** ( ) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.1	84.5	48.8	42.1
Hydro.	Dia., mm	0.045	0.032	0.020	0.012	0.0085	0.0060	0.0030	0.0013							
	% Passing	38.2	36.0	33.4	30.9	28.3	26.6	23.1	18.0							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1a D-1 11.00-11.80m		Sample No. Depth	LD2-11-1a D-1 11.00-11.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.14 mm	
2.00 - 0.425 mm	1.9 %		Dia. at 30%	0.011 mm	
0.425 - 0.075 mm	56.0 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	16.7 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	25.4 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	42.1 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **02.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

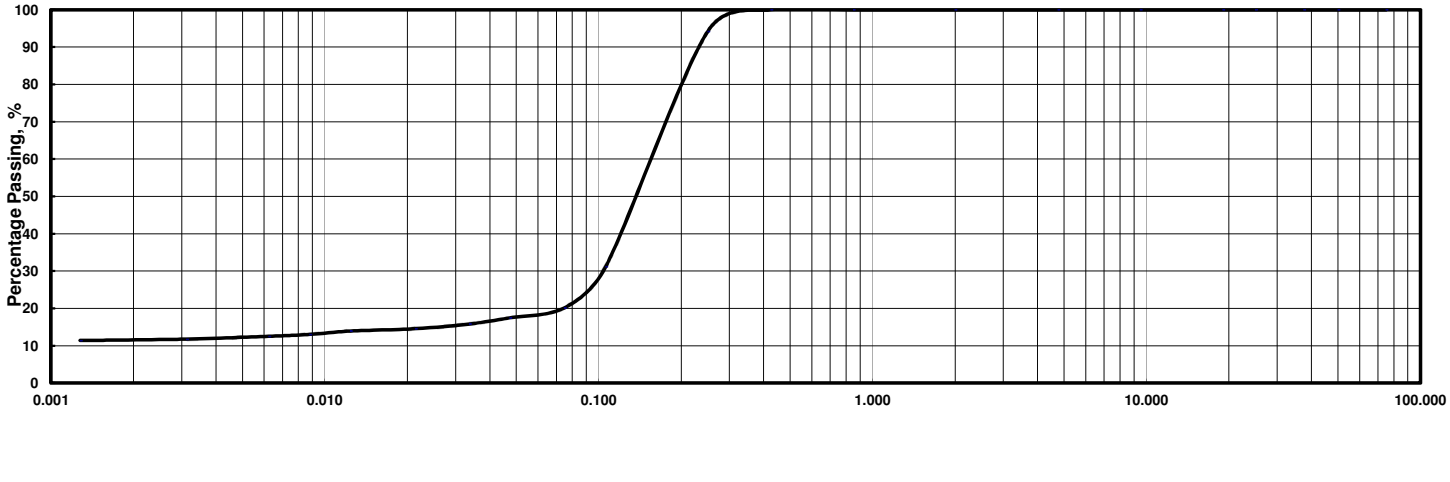
Sample No. : **LD2-11-1a D-2** Depth : **14.00-14.60m** ( ) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.2	31.2	20.2
Hydro.	Dia., mm	0.047	0.034	0.021	0.012	0.0088	0.0062	0.0031	0.0013							
	% Passing	17.5	15.8	14.6	13.9	13.0	12.5	11.8	11.4							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1a D-2 14.00-14.60m		Sample No. Depth	LD2-11-1a D-2 14.00-14.60m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.16 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.10 mm	
0.425 - 0.075 mm	79.8 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	7.9 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	12.2 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	20.2 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **21.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

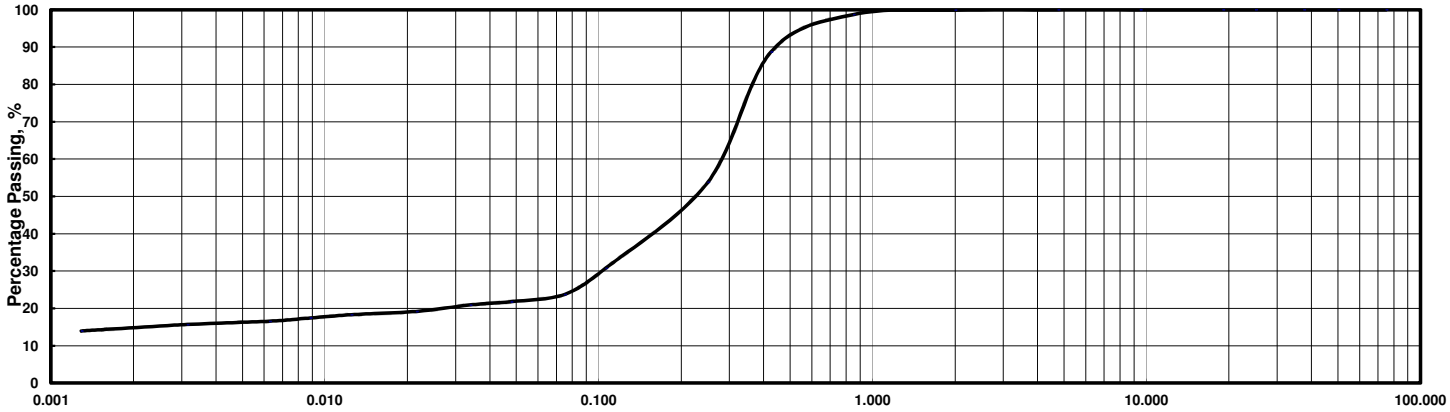
Sample No. : **LD2-11-1a D-3** Depth : **17.00-17.80m** ( ) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	98.7	88.7	53.8	30.8	23.8
Hydro.	Dia., mm	0.048	0.034	0.022	0.012	0.0088	0.0063	0.0031	0.0013							
	% Passing	21.8	20.9	19.2	18.3	17.4	16.6	15.7	14.0							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1a D-3 17.00-17.80m		Sample No. Depth	LD2-11-1a D-3 17.00-17.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.1 %		Dia. at 60%	0.27 mm	
2.00 - 0.425 mm	11.2 %		Dia. at 30%	0.10 mm	
0.425 - 0.075 mm	64.9 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	7.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	16.2 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	98.7 %				
75um Sieve Passing	23.8 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **02.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

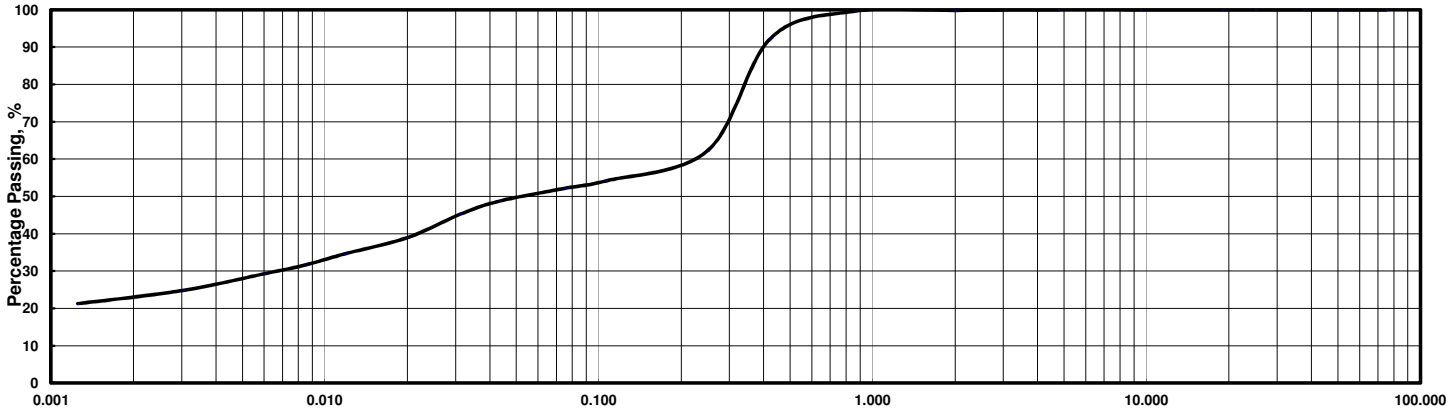
Sample No. : **LD2-11-1a D-4** Depth : **20.00-20.70m** ( ) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.6	92.4	62.3	54.1	52.1
Hydro.	Dia., mm	0.044	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0013							
	% Passing	48.8	45.2	39.0	34.6	31.6	29.3	24.8	21.3							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1a D-4 20.00-20.70m		Sample No. Depth	LD2-11-1a D-4 20.00-20.70m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.2 %		Dia. at 60%	0.20 mm	
2.00 - 0.425 mm	7.4 %		Dia. at 30%	0.0067 mm	
0.425 - 0.075 mm	40.3 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	24.4 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	27.8 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.6 %				
75um Sieve Passing	52.1 %				

Summary of Consolidated Drained Triaxial Compression Test

Project No.: S27-14	Project :Preparatory Survey on Matarbari USC Coral-fired Power Project		
Date Tested : 11.12.14	Tested by : Perera	Checked by : A. B. Tan	
Borehole No.: LD2-11-1a	Sample No.:D-2	Depth : 14.00-14.60m	
Specimen Condition : Remoulded	Test Method : ASTM D7181-11		
Soil Description : Clayey Sand	Ave. Diameter : 50.0mm	Ave. Height : 100.0mm	

	Specimen No.		1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.44	1.44	1.44		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	570	600		
	B-value		0.96	0.97	0.96		
Consolidation Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	529	558	587		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.04	0.10	0.10		
	Coefficient of Consolidation Cv,	m^2/year	930	788	676		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.010	0.014	0.010		
Compression Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	127	198	289		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-1.26	-0.22	0.05		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	10.48	11.85	9.32		
Shear Strength Parameters	ϕ_d = 36 Degree c_d = 0 kPa		Mode of Failure				

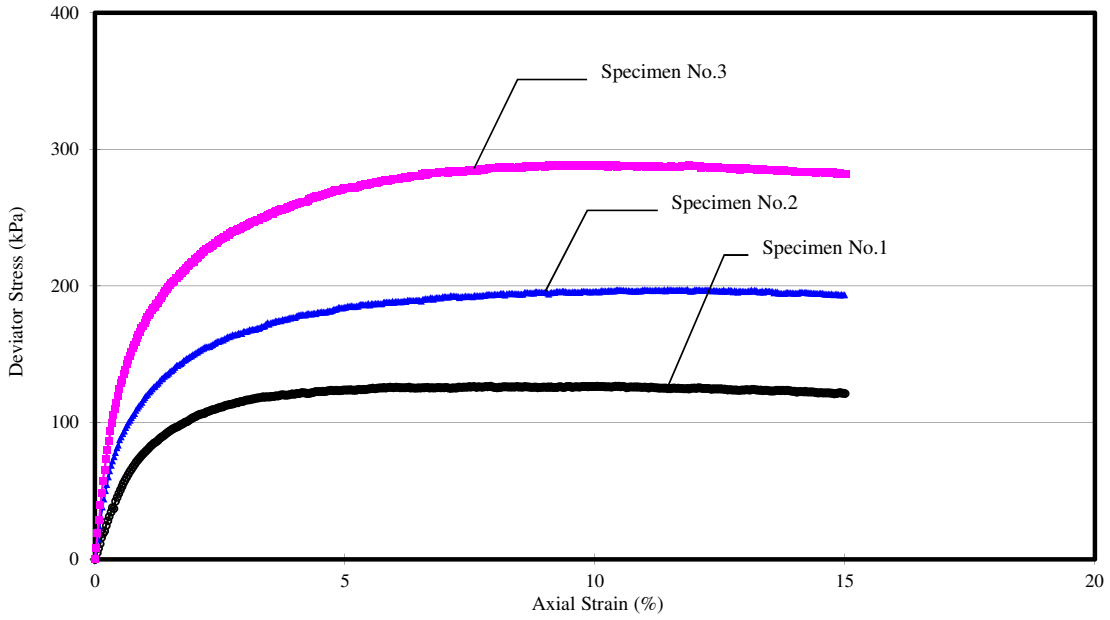
1 2 3 4

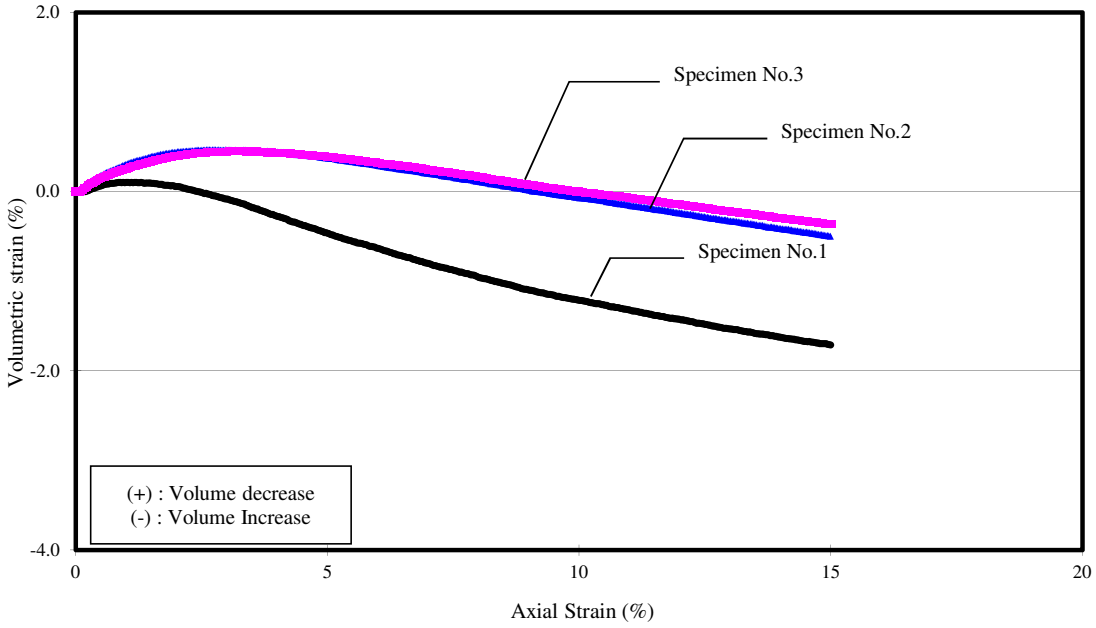
Remarks :

Specimens are prepared at 90% of Maximum dry density (from compaction Test)= 1.44Mg/m^3

Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-2 Soil Type: Clayey Sand
Borehole No.: LD2-11-1a Depth : 14.00-14.60m





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

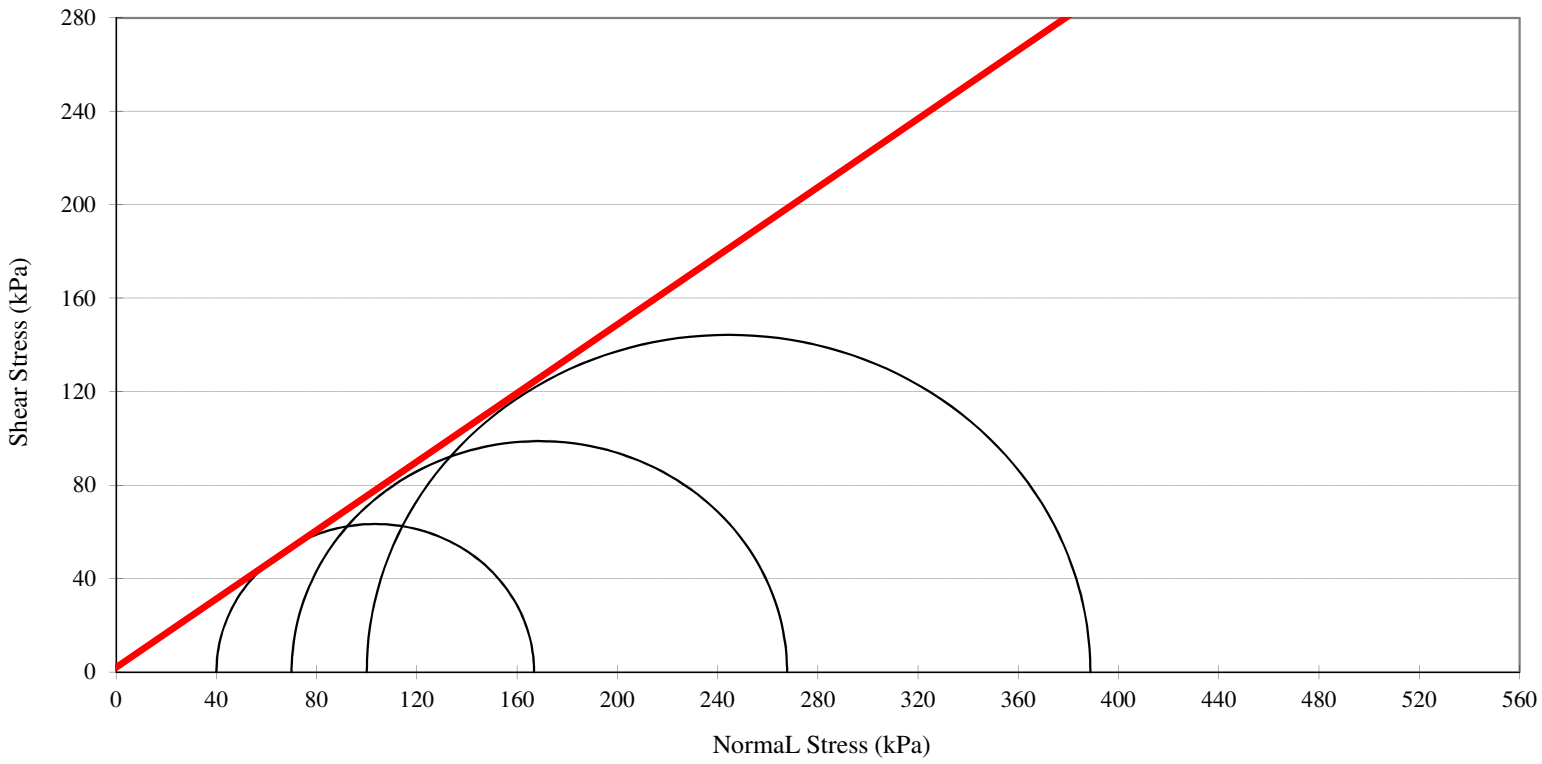
Project No. : S27-14

Borehole No. : LD2-11-1a Soil Type: Clayey Sand

Sample No. : D-2 Depth : 14.00-14.60m

Angle of Internal Friction, ϕ_d 36 deg

Cohesion, c_d 0 kPa



Kiso-Jiban Consultants Co., Ltd.

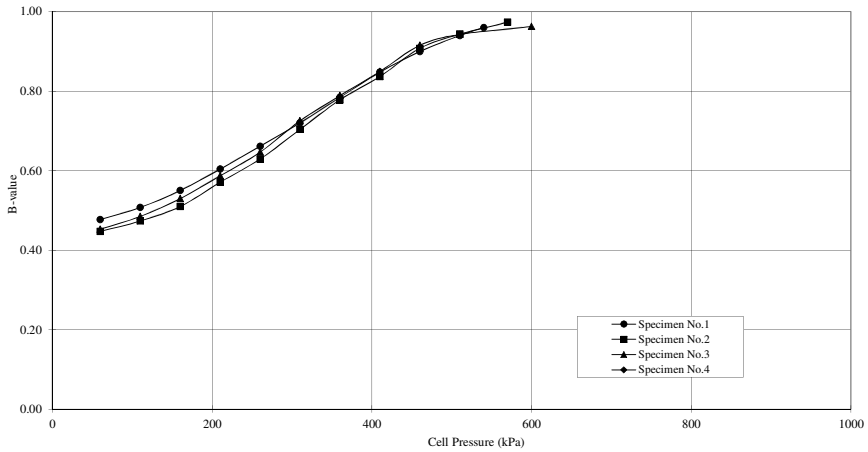
273

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: LD2-11-1a
Sample No.: D-2

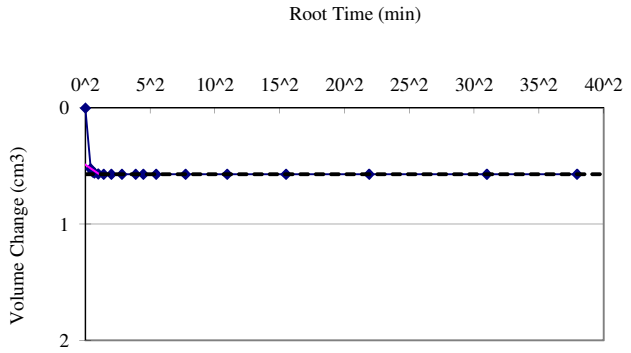
Depth : 14.00-14.60m
Soil Type: Clayey Sand

		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	34.3	20	33.4	20	33.6		
	Back Pressure (kPa)	20		20		20			
	B-value	0.48		0.45		0.45			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	75.4	50	73.7	50	74.2		
	Back Pressure (kPa)	50		50		50			
	B-value	0.51		0.47		0.48			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	127.5	100	125.5	100	126.5		
	Back Pressure (kPa)	100		100		100			
	B-value	0.55		0.51		0.53			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	180.2	150	178.5	150	179.3		
	Back Pressure (kPa)	150		150		150			
	B-value	0.60		0.57		0.59			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	233.1	200	231.5	200	232.3		
	Back Pressure (kPa)	200		200		200			
	B-value	0.66		0.63		0.65			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	286.0	250	285.2	250	286.3		
	Back Pressure (kPa)	250		250		250			
	B-value	0.72		0.70		0.73			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	339.2	300	338.9	300	339.4		
	Back Pressure (kPa)	300		300		300			
	B-value	0.78		0.78		0.79			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	392.4	350	391.8	350	392.5		
	Back Pressure (kPa)	350		350		350			
	B-value	0.85		0.84		0.85			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	445.0	400	445.4	400	445.8		
	Back Pressure (kPa)	400		400		400			
	B-value	0.90		0.91		0.92			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	497.0	450	497.2	450	497.1		
	Back Pressure (kPa)	450		450		450			
	B-value	0.94		0.94		0.94			
B-check Step.11	Cell Pressure (kPa)	510	540	510	570	510	600		
	P.W.P (kPa)	500	528.8	500	558.4	500	586.6		
	Back Pressure (kPa)	500		500		500			
	B-value	0.96		0.97		0.96			



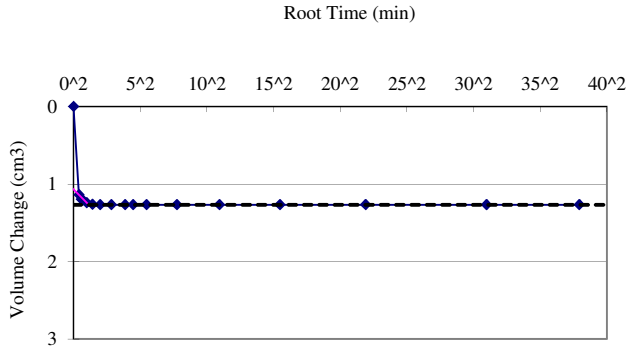
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: LD2-11-1a Soil Type: Clayey Sand
Sample No.: D-2 Depth : 14.00-14.60m



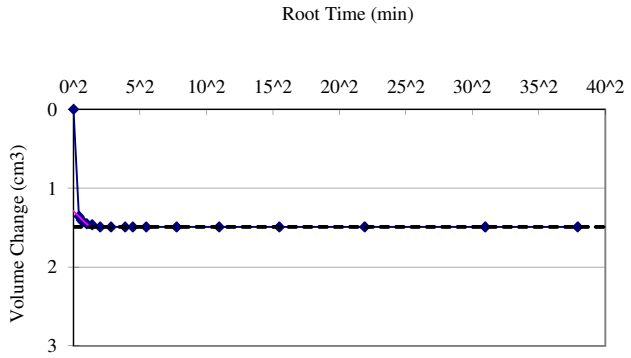
Specimen No.: 1

p' =	40	kPa
t100 =	1.1	min
Cv =	930	m^2/year
mvi=	0.010	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	1.3	min
Cv =	788	m^2/year
mvi=	0.014	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	1.5	min
Cv =	676	m^2/year
mvi=	0.010	m^2/MN

RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

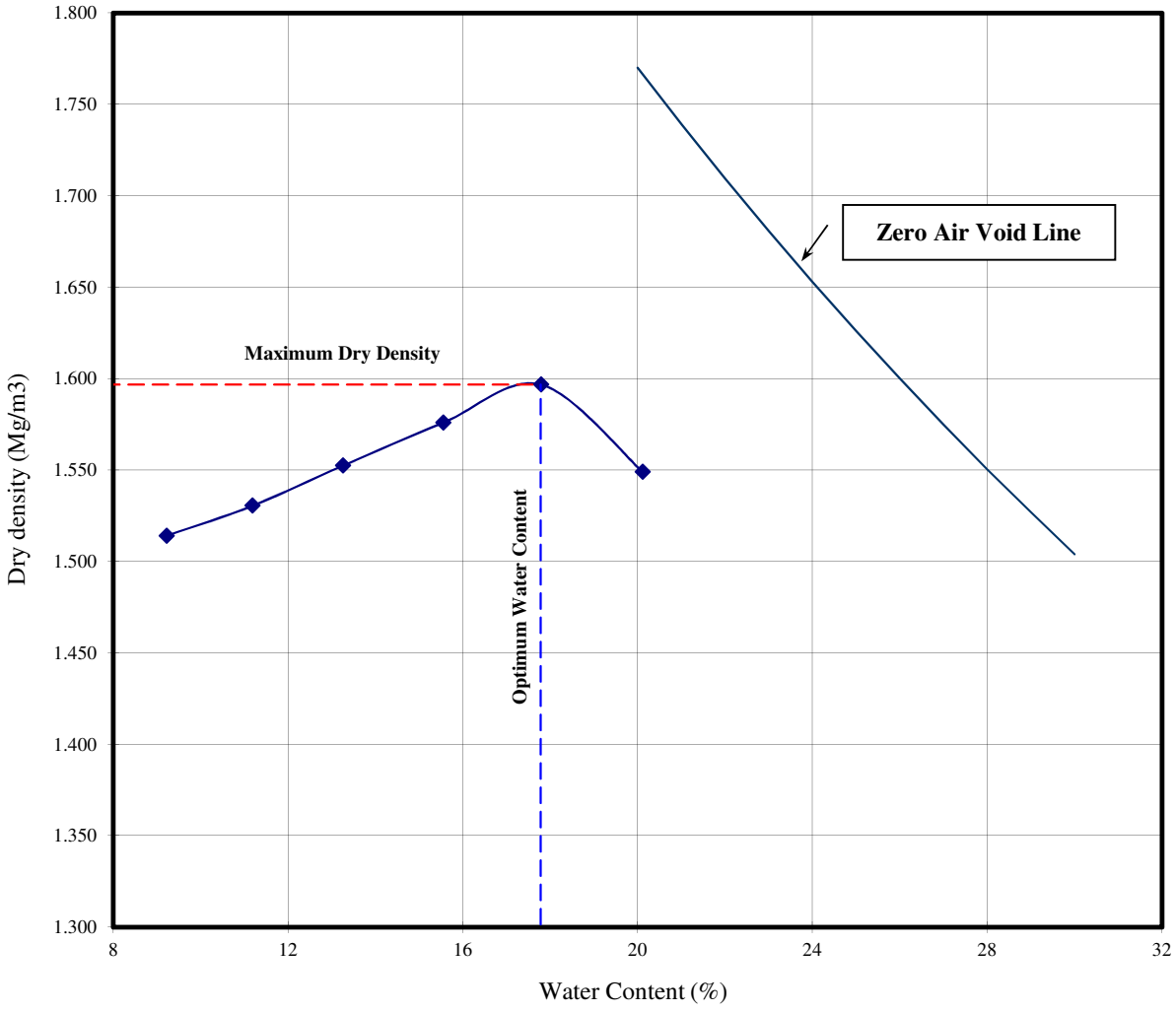
Sampling Date : - **Date of Testing :** 2-Dec-14 **Tested by :** Perera/Bala

Sample No. : LD2-11-1a D-2(14.00-14.60m) **Ref. No.** -

Soil Type :	Silty Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.74	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	9.2	11.2	13.3	15.6	17.8	20.1		
Wet Density (Mg/m3)	1.654	1.702	1.758	1.821	1.881	1.861		
Dry Density (Mg/m3)	1.514	1.531	1.552	1.576	1.597	1.549		

Maximum Dry Density	**1.597 Mg/m3**
Optimum Water Content	**17.8 %**



276

20) LD2-11-1b

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			LD2-11-1b								
Sample No.			HP-1	HP-2	HP-3	D-1	D-2	D-3			
Sample Depth			2.00m ~2.90m	6.00m ~6.90m	9.00m ~9.50m	12.00m ~12.85m	15.00m ~15.85m	18.00m ~18.60m			
Condition of Sample			Undisturbed			Disturbed					
Natural Water Content		%	51.8	32.3	24.2	19.8	34.3	23.9			
Specific Gravity			2.72	2.72	2.68	2.68	2.72	2.69			
Wet Density		Mg/m^3	1.72	1.90	1.87	1.99	1.79	-			
Dry Density		Mg/m^3	1.13	1.44	1.51	1.66	1.33	-			
Natural Void Ratio			1.40	0.89	0.78	0.61	1.04	-			
Degree of Saturation		%	100	99	83	87	90	-			
Atterberg Limits	Liquid Limit,	%	64	- *3	- *3	- *3	33	- *3			
	Plastic Limit,	%	30	- *3	- *3	- *3	19	- *3			
	Plasticity Index,	%	34	- *3	- *3	- *3	14	- *3			
Grain Size Analysis	Gravel,	%	0	0	0	0	0	0			
	Sand,	%	8	41	84	80	34	70			
	Silt,	%	41	34	16	8	37	17			
	Clay & Colloid,	%	51	25		12	29	13			
	Max. diameter,	mm	0.850	0.425	0.850	2.00	0.850	2.00			
	Diam. at 60%	mm	0.0079	0.078	0.16	0.31	0.060	0.13			
	Diam. at 10%	mm	-	-	-	-	-	-			
Visual soil description			Clay	Sandy Silt	Clayey Sand	Clayey Sand	Sandy Clay	Silty Sand			
Unified soil classification			CH	-	-	-	CL	-			
Triaxial compression test	Angle of Internal Friction	(^{0})	0	-	-	-	-	-			
	Cohesion Intercept, kPa		19	-	-	-	-	-			
	Condition of drainage		UU	-	-	-	-	-			
	Angle of Internal Friction *2	(^{0})	-	31	-	-	-	-			
	Cohesion Intercept, kPa *2		-	14	-	-	-	-			
	Condition of drainage		-	$\overline{CU}$	-	-	-	-			
Consolidation Test	Preconsolidation Pressure,	kPa	-	-	-	-	-	-			
	Compression Index(Average)		-	-	-	-	-	-			
	Pressure Range for Compression Index(kPa)		-	-	-	-	-	-			
	Swell index		-	-	-	-	-	-			
Chemical Test	pH value		-	-	-	-	-	-			
	Total sulphate content as SO_3,	%	-	-	-	-	-	-			
	Chloride content as Cl,	%	-	-	-	-	-	-			
	Organic Matter content,	%	-	-	-	-	-	-			
Unconfined Compression Strength (kPa)			-	-	-	-	-	-			
Strain at failure (%)			-	-	-	-	-	-			

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

Checked by : A. B. Tan

278

Kiso-Jiban Consultants Co., Ltd.

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No. : S27-14

Standard : ASTM D4318-10

Date of Testing : 22.11.14

Tested By : Vasantha

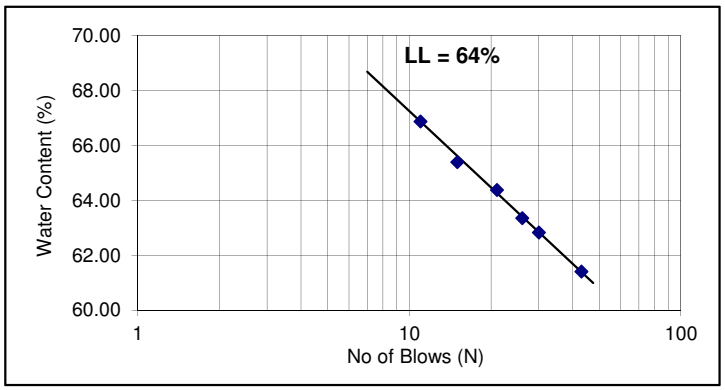
Checked By : A. B. Tan

Sample No. : LD2-11-1b HP-1

Depth : 2.00-2.90m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	43	61.40
2	30	62.83
3	26	63.35
4	21	64.38
5	15	65.38
6	11	66.87
Liquid Limits %		**64**
Plastic Limits %		**30**
Plasticity Index		**34**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No. : S27-14

Standard : ASTM D4318-10

Date of Testing : 04.12.14

Tested By : Vasantha

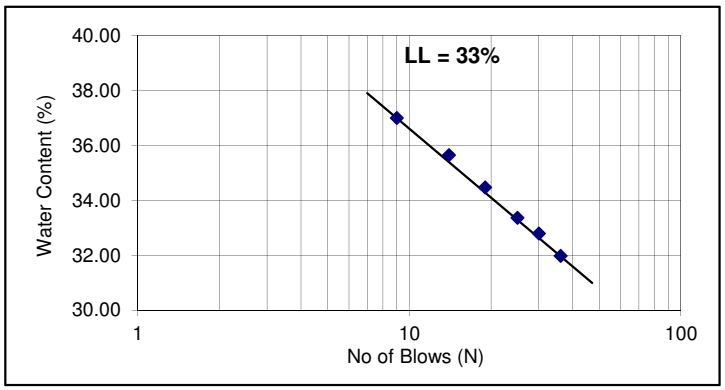
Checked By : A. B. Tan

Sample No. : LD2-11-1b D-2

Depth : 15.00-15.85m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	36	31.98
2	30	32.79
3	25	33.36
4	19	34.47
5	14	35.64
6	9	36.99
Liquid Limits %		**33**
Plastic Limits %		**19**
Plasticity Index		**14**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

280

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **24.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

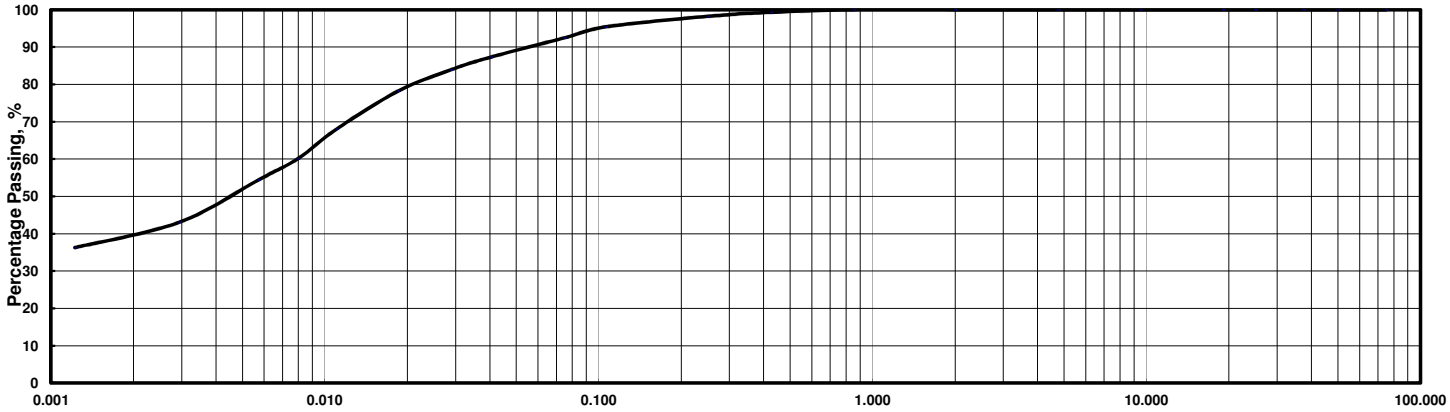
Sample No. : **LD2-11-1b HP-1** Depth : **2.00-2.90m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3	98.2	95.4	92.5
Hydro.	Dia., mm	0.040	0.029	0.019	0.011	0.0080	0.0057	0.0029	0.0012							
	% Passing	87.3	83.9	78.2	68.0	60.1	54.4	43.1	36.3							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1b HP-1 2.00-2.90m			Sample No. Depth	LD2-11-1b HP-1 2.00-2.90m		
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.0079	mm	
2.00 - 0.425 mm	0.7	%		Dia. at 30%	-	mm	
0.425 - 0.075 mm	6.8	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	41.0	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	51.5	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	100.0	%					
75um Sieve Passing	92.5	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **24.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

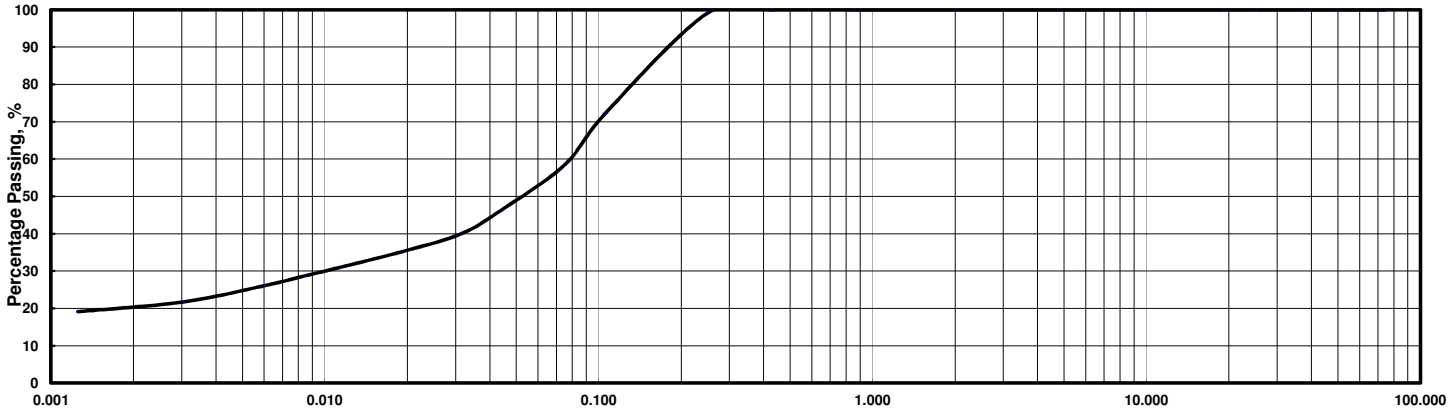
Sample No. : **LD2-11-1b HP-2** Depth : **6.00-6.90m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1	72.3	58.4
Hydro.	Dia., mm	0.044	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0013							
	% Passing	46.1	40.0	35.6	31.3	28.7	26.1	21.7	19.1							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1b HP-2 6.00-6.90m			Sample No. Depth	LD2-11-1b HP-2 6.00-6.90m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.425	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.078	mm
2.00 - 0.425 mm	0.0	%		Dia. at 30%	0.010	mm
0.425 - 0.075 mm	41.6	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	33.8	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	24.6	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	58.4	%				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **01.12.14** Tested By : **Motiur** Checked by : **A. B. Tan**

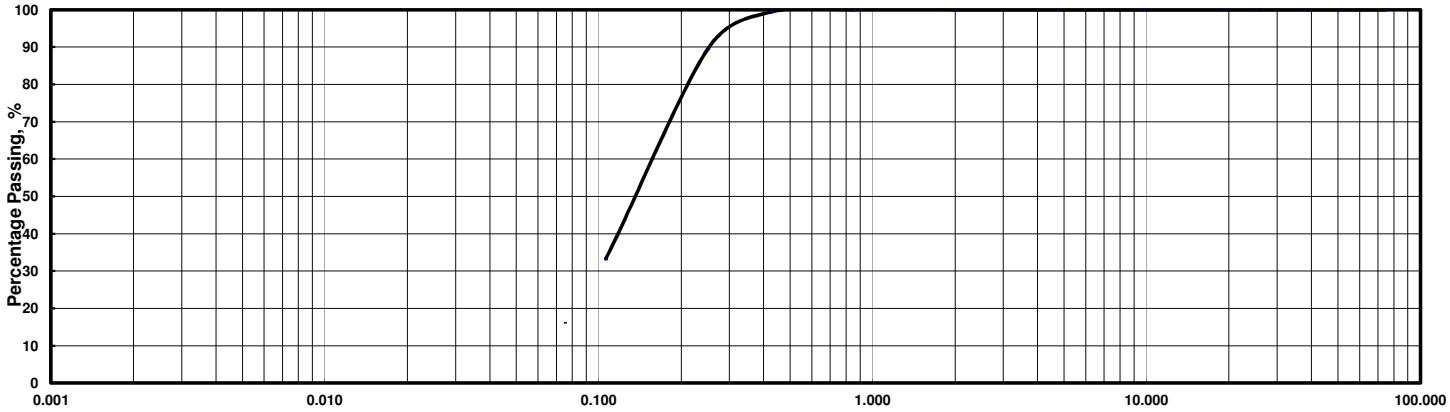
Sample No. : **LD2-11-1b HP-3** Depth : **9.00-9.50m** ( ) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	89.5	33.3	16.2
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1b HP-3 9.00-9.50m			Sample No. Depth	LD2-11-1b HP-3 9.00-9.50m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.16	mm
2.00 - 0.425 mm	0.6	%		Dia. at 30%	0.10	mm
0.425 - 0.075 mm	83.1	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	16.2	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm				Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	16.2	%				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **09.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

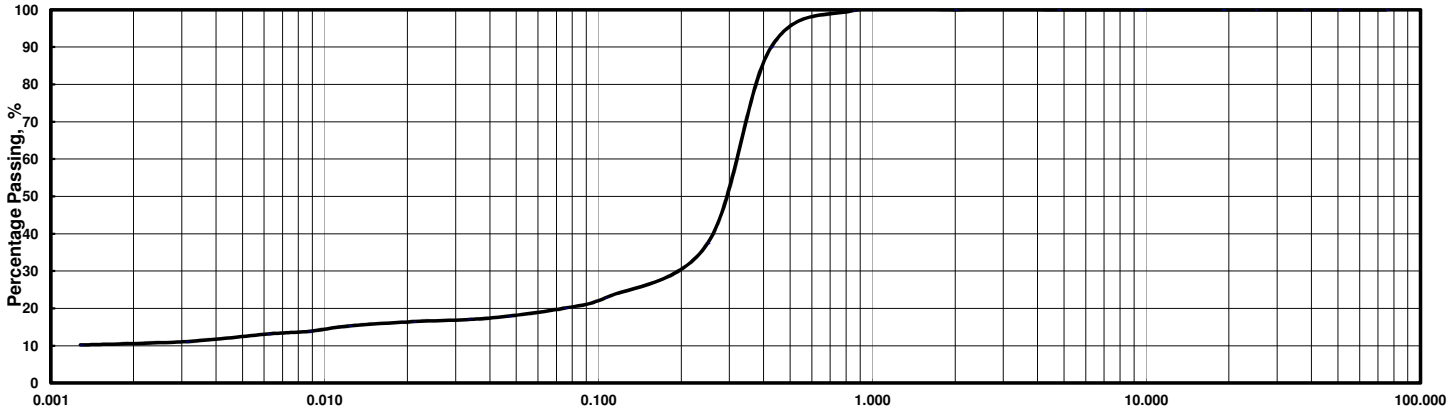
Sample No. : **LD2-11-1b D-1** Depth : **12.00-12.85m** ( ) Specific Gravity : 2.68

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	89.9	37.5	22.9	20.1
Hydro.	Dia., mm	0.047	0.033	0.021	0.012	0.0087	0.0062	0.0031	0.0013							
	% Passing	17.9	17.0	16.4	15.3	13.8	13.2	11.1	10.2							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	LD2-11-1b D-1 12.00-12.85m			Sample No. Depth	LD2-11-1b D-1 12.00-12.85m		
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.31	mm	
2.00 - 0.425 mm	10.1	%		Dia. at 30%	0.16	mm	
0.425 - 0.075 mm	69.8	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	7.7	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	12.4	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.7	%					
75um Sieve Passing	20.1	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **21.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

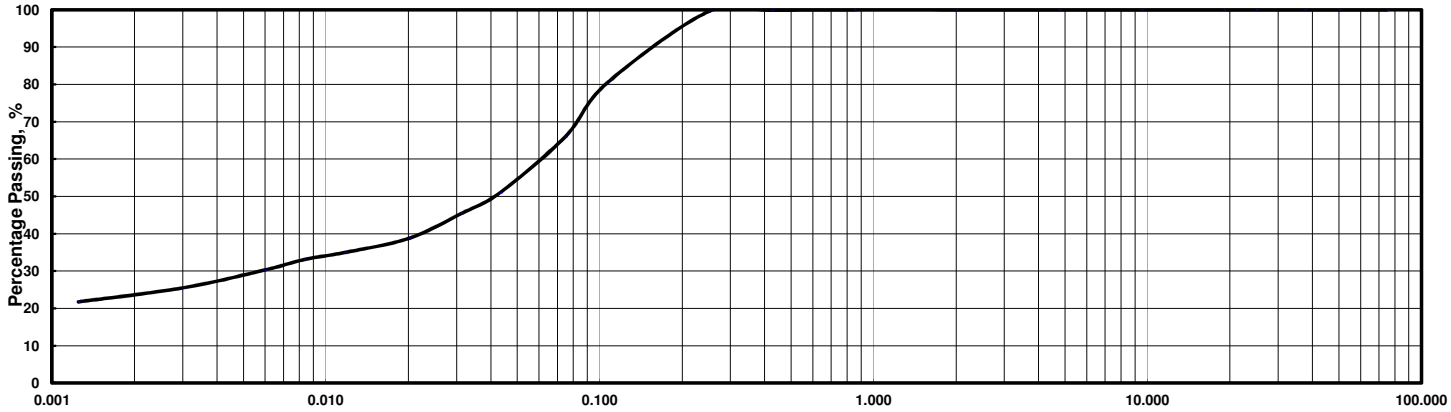
Sample No. : **LD2-11-1b D-2** Depth : **15.00-15.85m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.5	80.3	66.1
Hydro.	Dia., mm	0.043	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0012							
	% Passing	51.1	45.4	38.8	35.0	33.1	30.3	25.5	21.8							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1b D-2 15.00-15.85m		Sample No. Depth	LD2-11-1b D-2 15.00-15.85m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.060 mm	
2.00 - 0.425 mm	0.2 %		Dia. at 30%	0.0057 mm	
0.425 - 0.075 mm	33.8 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	37.4 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	28.7 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	66.1 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **28.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

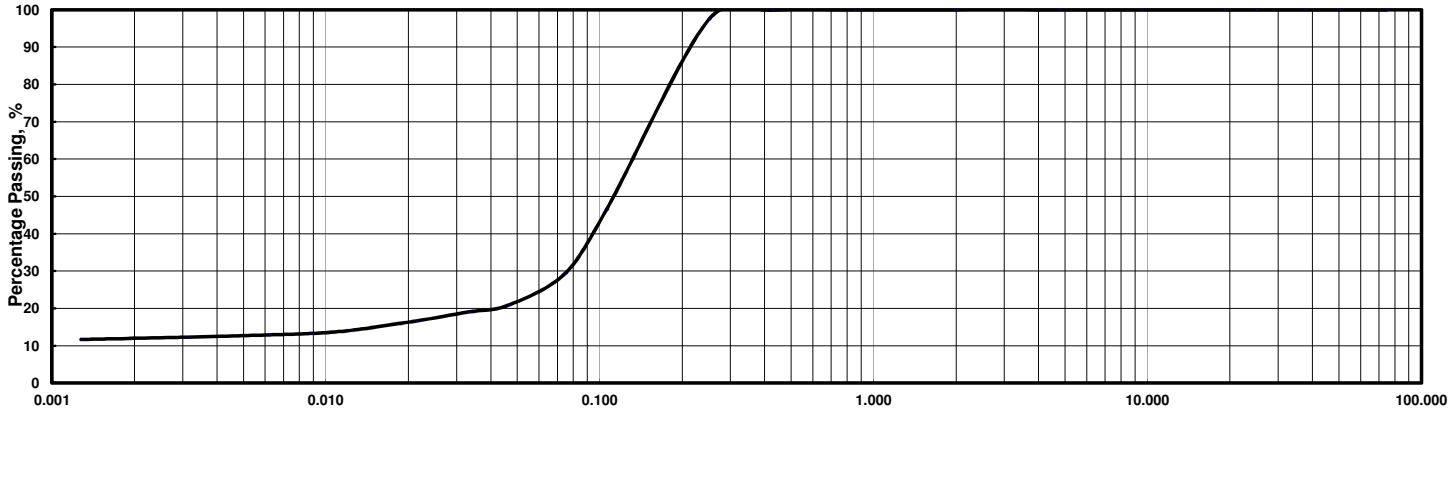
Sample No. : **LD2-11-1b D-3** Depth : **18.00-18.60m** ( ) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.9	97.4	46.5	29.5
Hydro.	Dia., mm	0.047	0.033	0.021	0.012	0.0088	0.0062	0.0031	0.0013							
	% Passing	20.9	19.1	16.6	14.1	13.3	12.9	12.3	11.7							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



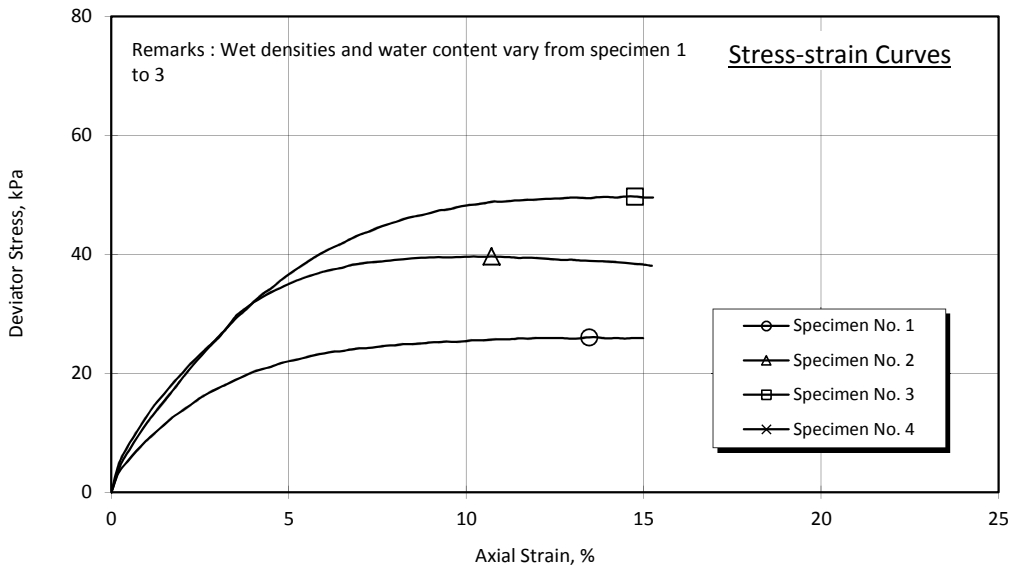
0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-11-1b D-3 18.00-18.60m			Sample No. Depth	LD2-11-1b D-3 18.00-18.60m		
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.13	mm	
2.00 - 0.425 mm	0.1	%		Dia. at 30%	0.076	mm	
0.425 - 0.075 mm	70.4	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	16.8	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	12.7	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.9	%					
75um Sieve Passing	29.5	%					

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

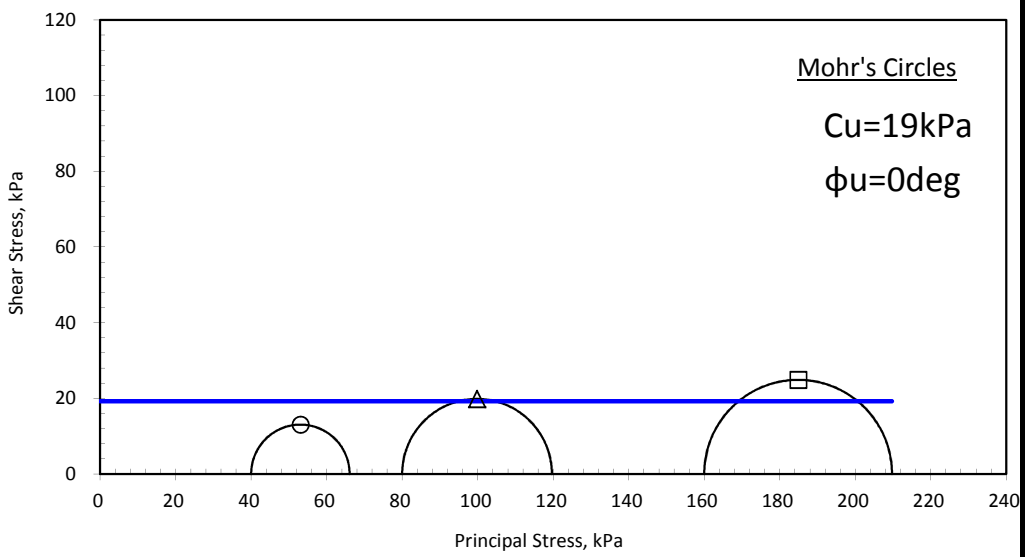
Project :	Preparatory Survey on Matarbari USC Coral-fired Power Project	Project No. :	S27-14
Standard :	ASTM D2850-03a	Date of Testing :	19.11.14
Borehole No.:	LD2-11-1b Depth : 2.00-2.90m	Tested by :	Perera
Sample No. :	HP-1 Strain Rate 1.00 %/min	Checked by :	A. B. Tan

Specimen No.	Condition of Sample	Size of Specimen (mm)		Natural Water Content	Bulk Density	Dy Density	Cell Pressure	Peak Deviator Stress	Modulus of Deformation	Corrected Initial Strain	Strain at Failure
		Height	Diameter	(%)	(Mg/m3)	(Mg/m3)	(kPa)	(kPa)	E50 (kPa)	(%)	(%)
1	Undisturbed	99.80	50.00	56.9	1.64	1.05	40	26.1	712	N/A	13.46
2	Undisturbed	99.80	50.10	66.4	1.55	0.93	80	39.6	1011	N/A	10.71
3	Undisturbed	99.80	50.00	48.2	1.70	1.15	160	49.7	882	N/A	14.75
4											



After shearing (Spec. 1)

After shearing (Spec. 2)

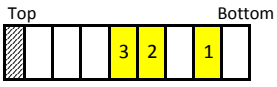


After shearing (Spec. 3)

After shearing (Spec. 4)

Remarks :
- [Strain at failure]=[Recorded strain at failure] - [Corrected Initial Strain]
- Latex membrane with 0.2mm in thickness is used.
- Membrane correction is carried out based on BS 1377 : 1990

Portion Tested



Kiso-Jiban Consultants Co Ltd
Singapore Branch

287

Summary of Consolidated Undrained Triaxial Compression Test
With Porewater Pressure Measurement

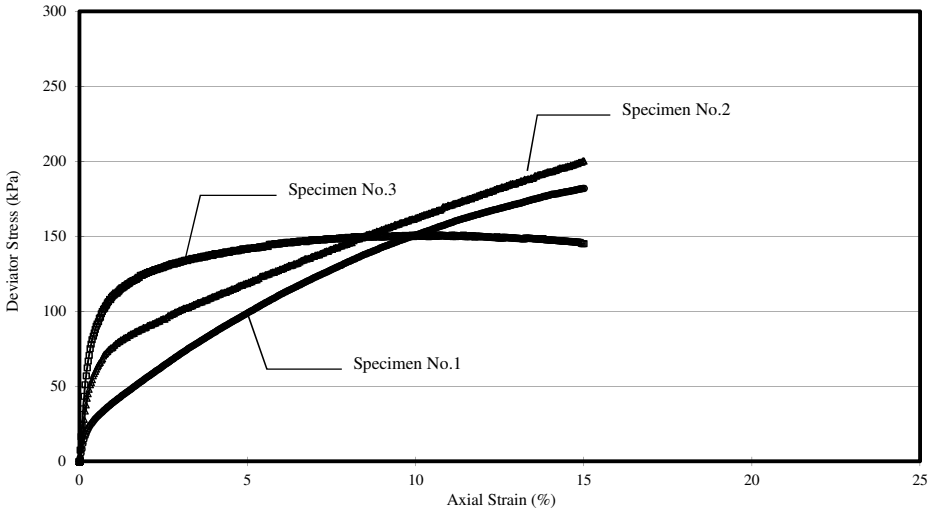
Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 19.11.14		Tested by : Rahim		Checked by : A. B. Tan			
Borehole No : LD2-11-1b		Sample No.:HP-2		Depth :6.00-6.90m			
Specimen Condition : Undisturbed		Test Method : ASTM D4767-11					
Soil Description : Sandy Silt		Ave. Diameter : 50.0mm			Ave. Height : 100.0mm		
	Specimen No.		1	2	3		
Initial Condition	Wet Density,	Mg/m^3	1.93	1.92	1.86		
	Water Content,	%	28.3	30.4	33.9		
	Dry Density	Mg/m^3	1.51	1.47	1.39		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	580	660		
	B-value		0.99	1.00	0.97		
Consolidation	Cell Pressure	kPa	540	580	660		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	530	570	646		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Total Volume Change,	%	1.18	1.16	4.09		
	Coefficient of Consolidation Cv,	m^2/year	12.43	43.26	7.73		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.30	0.14	0.26		
Compression Stage	Cell Pressure	kPa	540	580	660		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	80	160		
	Shearing Speed	mm/min	0.03	0.03	0.03		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	182	200	151		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	-26	14	114		
	A-Coefficient		-0.15	0.07	0.76		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	15.01	14.98	10.65		
	Effective Principal Stress Ratio		3.74	4.05	4.28		
Final Conditions	Wet Density,	Mg/m^3	1.95	1.94	1.92		
	Water Content,	%	29.9	30.7	31.7		
Shear Strength Parameters	In terms of Effective Stress ϕ' = 31 Degree c ' = 14 kPa		Mode of Failure 1 2 3 4				
Remarks : Specimen 3 has lower density and higher water content							

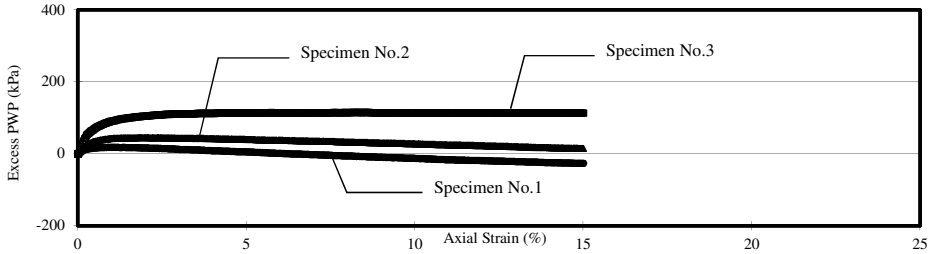
Consolidated Undrained Triaxial Compression Test
With Porewater Pressure Measurement

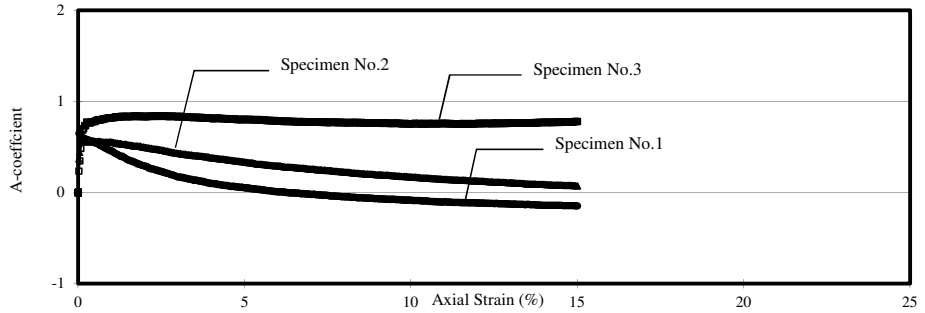
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

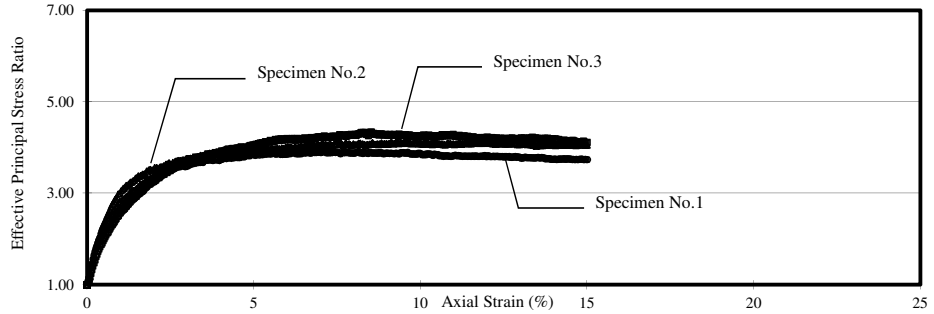
Project No.: S27-14 Sample No.: HP-2 Soil Type: Sandy Silt

Borehole No.: LD2-11-1b Depth :6.00-6.90m





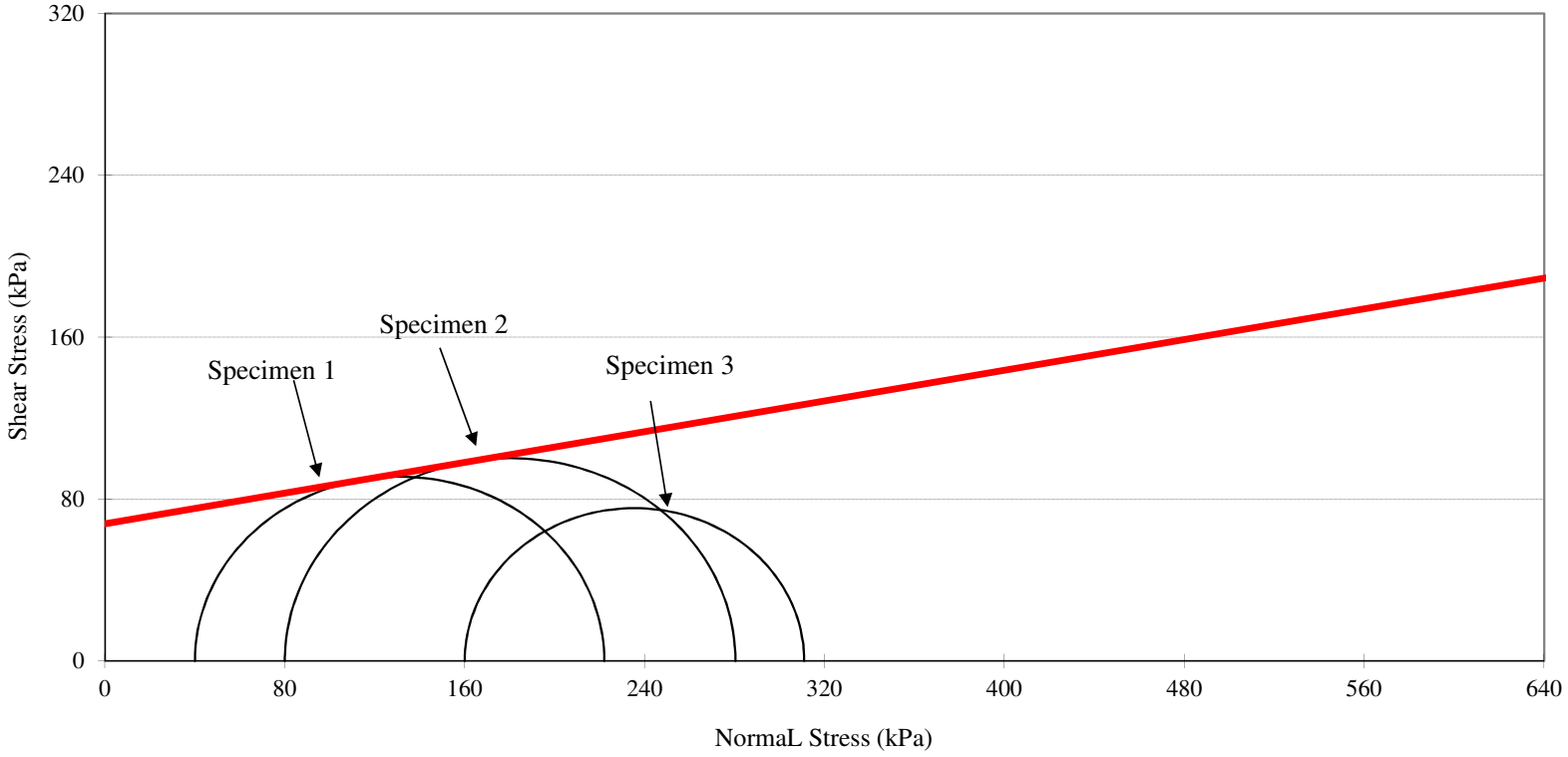




Consolidated Undrained Triaxial Compression Test
With Pore water Pressure Measurement
- Mohr' s Circle (In terms of Total Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14

Borehole No.: LD2-11-1b
Soil Type: Sandy Silt
Sample No. : HP-2
Depth :6.00-6.90m
Angle of Internal Friction, ϕ 11 deg
Cohesion, c 68 kPa



Kiso-Jiban Consultants Co., Ltd.

Consolidated Undrained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Effective Stress at Peak Deviator Stress)-

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

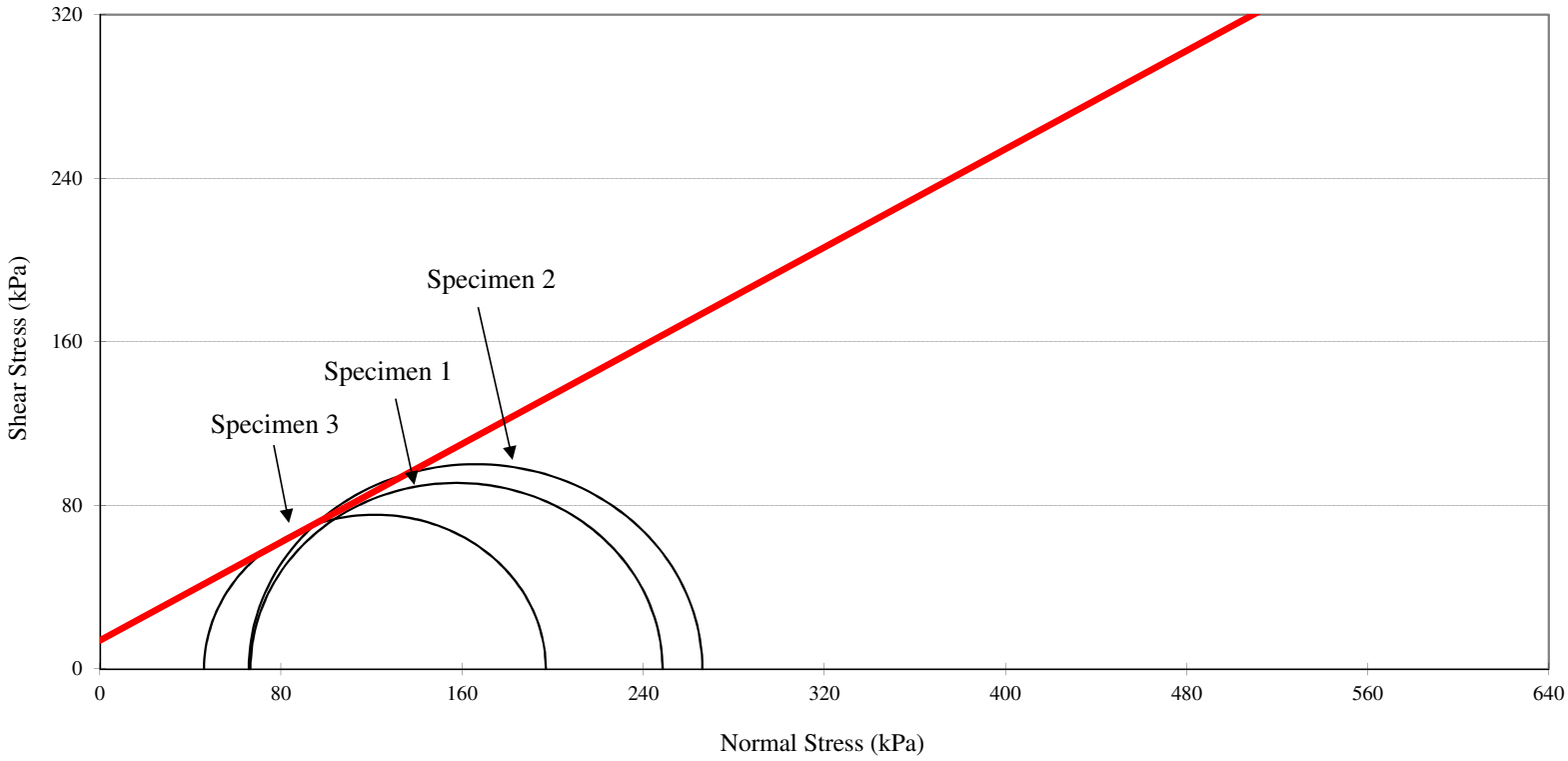
Project No. : S27-14

Borehole No.: LD2-11-1b Soil Type: Sandy Silt

Sample No. : HP-2 Depth :6.00-6.90m

Angle of Internal Friction, ϕ' 31 deg

Cohesion, c' 14 kPa



Kiso-Jiban Consultants Co., Ltd.

291

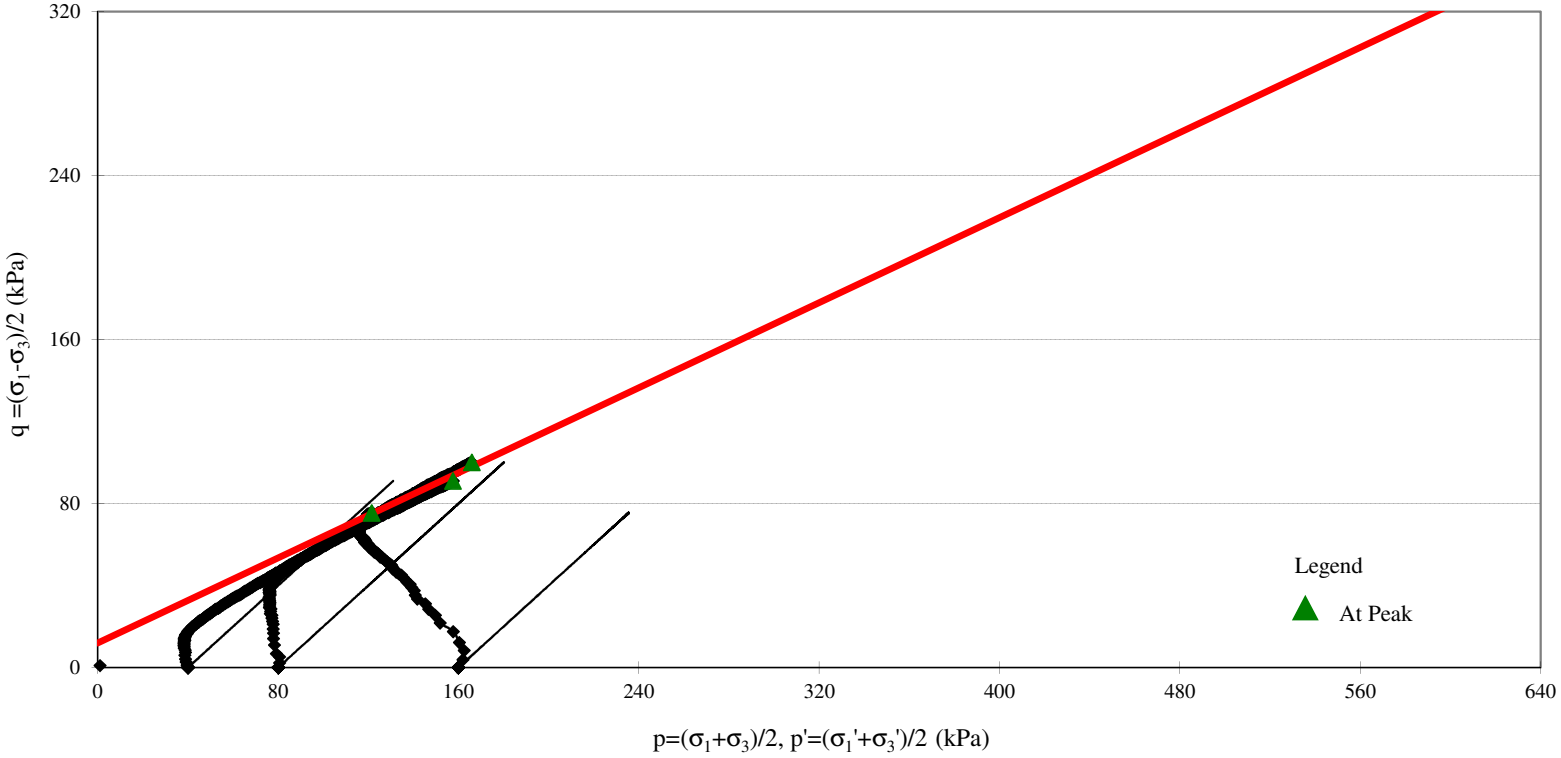
Consolidated Undrained Triaxial Compression Test
With Pore water Pressure Measurement
- Stress Path -

Borehole No.: LD2-11-1b Soil Type: Sandy Silt

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project Sample No. : HP-2 Depth :6.00-6.90m

Project No. : S27-14

α'	27	deg
a'	12	kPa



Kiso-Jiban Consultants Co., Ltd.

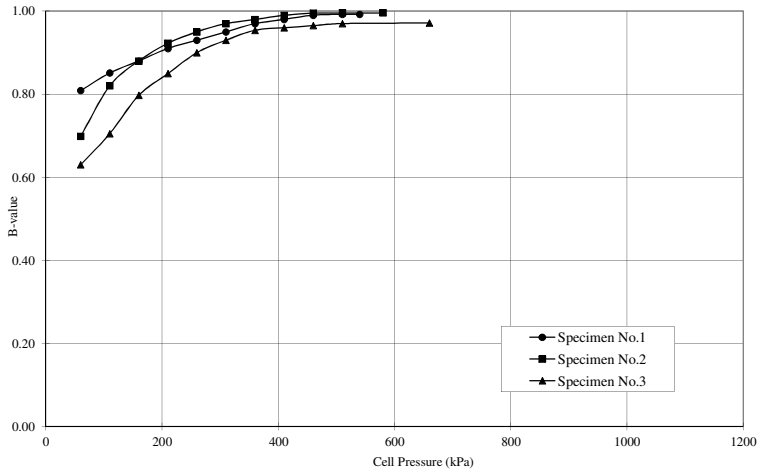
292

Consolidated Undrained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: LD2-11-1b
Sample No.: HP-2

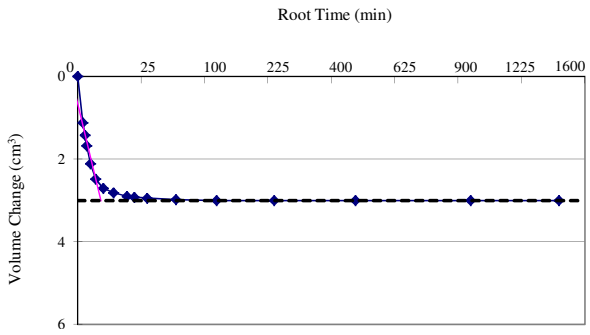
Depth : 6.00-6.90m
Soil Type: Sandy Silt

		Result of B-value Check					
		Specimen 1		Specimen 2		Specimen 3	
		Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60
	P.W.P (kPa)	20	44.3	20	40.9	20	38.9
	Back Pressure (kPa)	20		20		20	
	B-value	0.81		0.70		0.63	
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110
	P.W.P (kPa)	50	92.6	50	91.0	50	85.2
	Back Pressure (kPa)	50		50		50	
	B-value	0.85		0.82		0.70	
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160
	P.W.P (kPa)	100	144.0	100	144.0	100	139.9
	Back Pressure (kPa)	100		100		100	
	B-value	0.88		0.88		0.80	
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210
	P.W.P (kPa)	150	195.5	150	196.1	150	192.5
	Back Pressure (kPa)	150		150		150	
	B-value	0.91		0.92		0.85	
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260
	P.W.P (kPa)	200	246.5	200	247.5	200	245.0
	Back Pressure (kPa)	200		200		200	
	B-value	0.93		0.95		0.90	
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310
	P.W.P (kPa)	250	297.5	250	298.5	250	296.5
	Back Pressure (kPa)	250		250		250	
	B-value	0.95		0.97		0.93	
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360
	P.W.P (kPa)	300	348.5	300	349.0	300	347.7
	Back Pressure (kPa)	300		300		300	
	B-value	0.97		0.98		0.95	
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410
	P.W.P (kPa)	350	399.0	350	399.5	350	398.0
	Back Pressure (kPa)	350		350		350	
	B-value	0.98		0.99		0.96	
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460
	P.W.P (kPa)	400	449.5	400	449.8	400	448.3
	Back Pressure (kPa)	400		400		400	
	B-value	0.99		1.00		0.97	
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510
	P.W.P (kPa)	450	499.6	450	499.8	450	498.5
	Back Pressure (kPa)	450		450		450	
	B-value	0.99		1.00		0.97	
B-check Step.11	Cell Pressure (kPa)	510	540	510	580	510	660
	P.W.P (kPa)	500	529.8	500	569.7	500	645.7
	Back Pressure (kPa)	500		500		500	
	B-value	0.99		1.00		0.97	



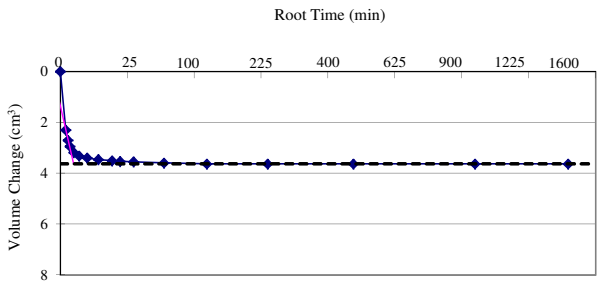
Consolidated Undrained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: HP-2 Soil Type: Sandy Silt
Borehole No.: LD2-11-1b Depth : 6.00-6.90m



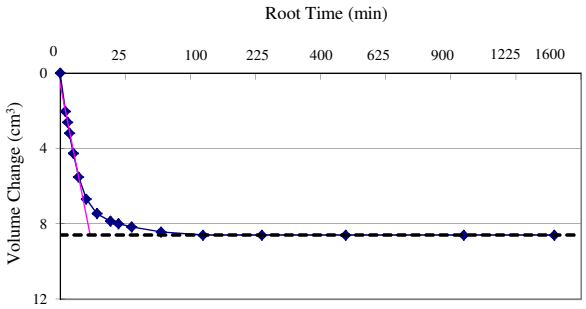
Specimen No.: 1

p' =	40	kPa
t100 =	3.3	min
Cv =	12.43	m^2/year
mvi=	0.30	m^2/MN



Specimen No.: 2

p' =	80	kPa
t100 =	1.0	min
Cv =	43.26	m^2/year
mvi=	0.14	m^2/MN



Specimen No.: 3

p' =	160	kPa
t100 =	5.3	min
Cv =	7.73	m^2/year
mvi=	0.26	m^2/MN

21) LD2-12-1a

295

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.			LD2-12-1a								
Sample No.			HP-1	D-1	D-2	D-3Top	D-3Bottom	D-4			
Sample Depth			2.00m ~2.90m	6.00m ~6.70m	9.00m ~9.70m	12.00m ~12.30m	12.30m ~12.80m	15.00m ~15.70m			
Condition of Sample			Undisturbed	Disturbed							
Natural Water Content		%	34.1	21.5	25.2	37.9	21.6	25.1			
Specific Gravity			2.74	2.67	2.71	2.72	2.67	2.69			
Wet Density		Mg/m^3	1.89	-	2.02	-	-	-			
Dry Density		Mg/m^3	1.41	-	1.61	-	-	-			
Natural Void Ratio			0.95	-	0.68	-	-	-			
Degree of Saturation		%	98	-	100	-	-	-			
Atterberg Limits	Liquid Limit,	%	36	- *3	29	25*1	- *3	- *3			
	Plastic Limit,	%	22	- *3	19	15*1	- *3	- *3			
	Plasticity Index,	%	14	- *3	10	10*1	- *3	- *3			
Grain Size Analysis	Gravel,	%	0	0	0	0	0	0			
	Sand,	%	19	92	42	42	92	71			
	Silt,	%	48	8	29	29	8	10			
	Clay & Colloid,	%	33		29	29		19			
	Max. diameter,	mm	2.00	2.00	0.850	2.00	4.75	2.00			
	Diam. at 60%	mm	0.023	0.31	0.081	0.088	0.32	0.16			
	Diam. at 10%	mm	-	0.11	-	-	0.11	-			
Visual soil description			Clay with Sand	Sand with Clay	Sandy Clay	Sandy Clay	Sand with Clay	Clayey Sand			
Unified soil classification			CL	-	CL	CL	-	-			
Triaxial compression test	Angle of Internal Friction	(^{0})	0	-	0	-	-	-			
	Cohesion Intercept, kPa		26	-	71	-	-	-			
	Condition of drainage		UU	-	UU	-	-	-			
	Angle of Internal Friction *2	(^{0})	-	39	-	-	36	36			
	Cohesion Intercept, kPa *2		-	0	-	-	0	0			
	Condition of drainage		-	CD*4	-	-	CD*4	CD*4			
Consolidation Test	Preconsolidation Pressure,	kPa	74	-	-	-	-	-			
	Compression Index(Average)		0.39	-	0.16	-	-	-			
	Pressure Range for Compression Index(kPa)		200-1600	-	1600-3200	-	-	-			
	Swell index		0.079	-	0.028	-	-	-			
Chemical Test	pH value		-	-	-	-	-	-			
	Total sulphate content as SO_3,	%	-	-	-	-	-	-			
	Chloride content as Cl,	%	-	-	-	-	-	-			
	Organic Matter content,	%	-	-	-	-	-	-			
Unconfined Compression Strength (kPa)			-	-	-	-	-	-			
Strain at failure (%)			-	-	-	-	-	-			

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

*4 : Specimens are prepared at required saturated wet density

Checked by : A. B. Tan

296

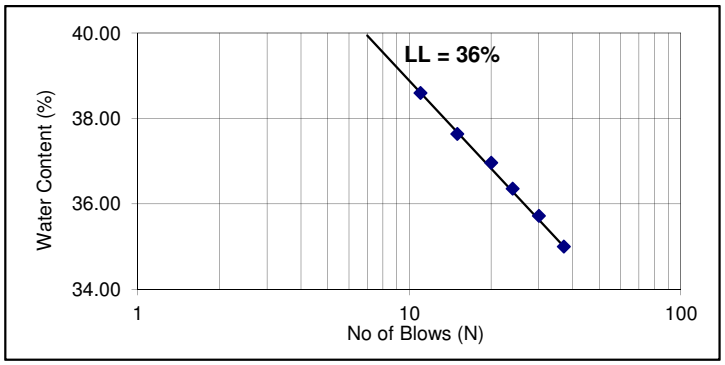
Kiso-Jiban Consultants Co., Ltd.

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14
Standard : ASTM D4318-10
Date of Testing : 19.11.14
Tested By : Vasantha
Checked By : A. B. Tan

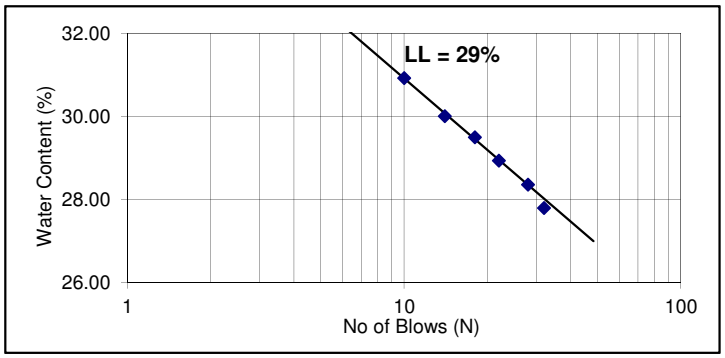
Sample No. : LD2-12-1a HP-1
Depth : 2.00-2.90m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	37	35.01
2	30	35.72
3	24	36.36
4	20	36.97
5	15	37.64
6	11	38.60
Liquid Limits %		**36**
Plastic Limits %		**22**
Plasticity Index		**14**



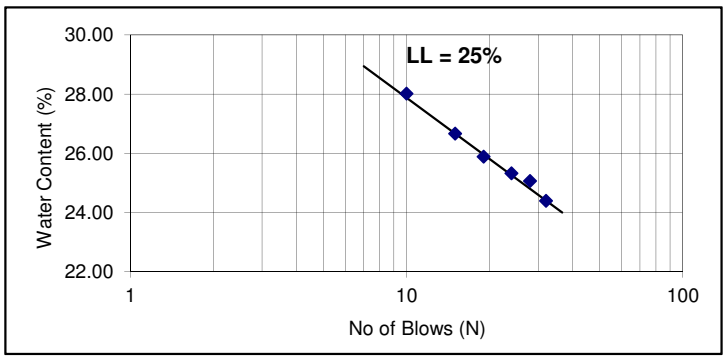
Sample No. : LD2-12-1a D-2
Depth : 9.00-9.70m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	32	27.79
2	28	28.36
3	22	28.93
4	18	29.49
5	14	30.00
6	10	30.92
Liquid Limits %		**29**
Plastic Limits %		**19**
Plasticity Index		**10**



Sample No. : LD2-12-1a D-3
Depth : 12.00-12.30m
Remarks : * Tested on dry sieved material passing 0.425mm sieve
Material passing through 0.425mm sieve : 94.4%

Liquid Limits Test		
Test No.	Blows	Wn
1	32	24.40
2	28	25.07
3	24	25.32
4	19	25.89
5	15	26.67
6	10	28.02
Liquid Limits %		**25**
Plastic Limits %		**15**
Plasticity Index		**10**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

297

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **19.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

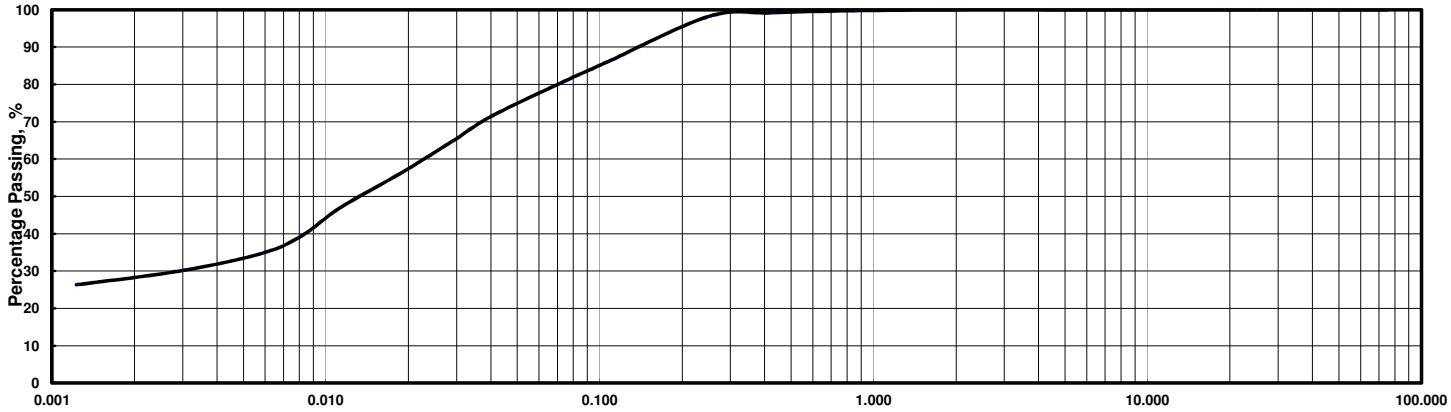
Sample No. : **LD2-12-1a HP-1** Depth : **2.00-2.90m** ( ) Specific Gravity : 2.74

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	99.2	98.2	85.9	81.0
Hydro.	Dia., mm	0.040	0.029	0.019	0.011	0.0082	0.0059	0.0030	0.0012							
	% Passing	71.5	64.9	56.4	47.0	39.5	34.8	30.1	26.3							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	LD2-12-1a HP-1 2.00-2.90m			Sample No. Depth	LD2-12-1a HP-1 2.00-2.90m		
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.023	mm	
2.00 - 0.425 mm	0.8	%		Dia. at 30%	0.0029	mm	
0.425 - 0.075 mm	18.2	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	47.6	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	33.4	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.7	%					
75um Sieve Passing	81.0	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **18.11.14** Tested By : **Motiur** Checked by : **A. B. Tan**

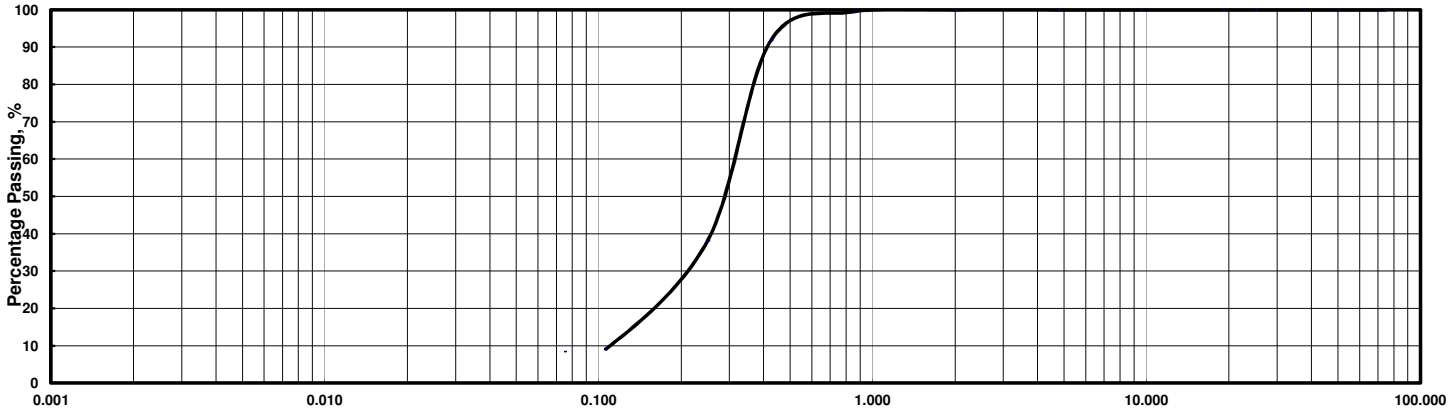
Sample No. : **LD2-12-1a D-1** Depth : **6.00-6.70m** ( ) Specific Gravity : 2.67

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	91.8	38.2	9.1	8.5
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-12-1a D-1 6.00-6.70m			Sample No. Depth	LD2-12-1a D-1 6.00-6.70m	
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.31	mm
2.00 - 0.425 mm	8.2	%		Dia. at 30%	0.20	mm
0.425 - 0.075 mm	83.3	%		Dia. at 10%	0.11	mm
0.075 - 0.005 mm	8.5	%		Coeff. of Uniformity	2.85	
Smaller than 0.005 mm				Coeff. of Curvature	1.14	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.4	%				
75um Sieve Passing	8.5	%				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **19.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

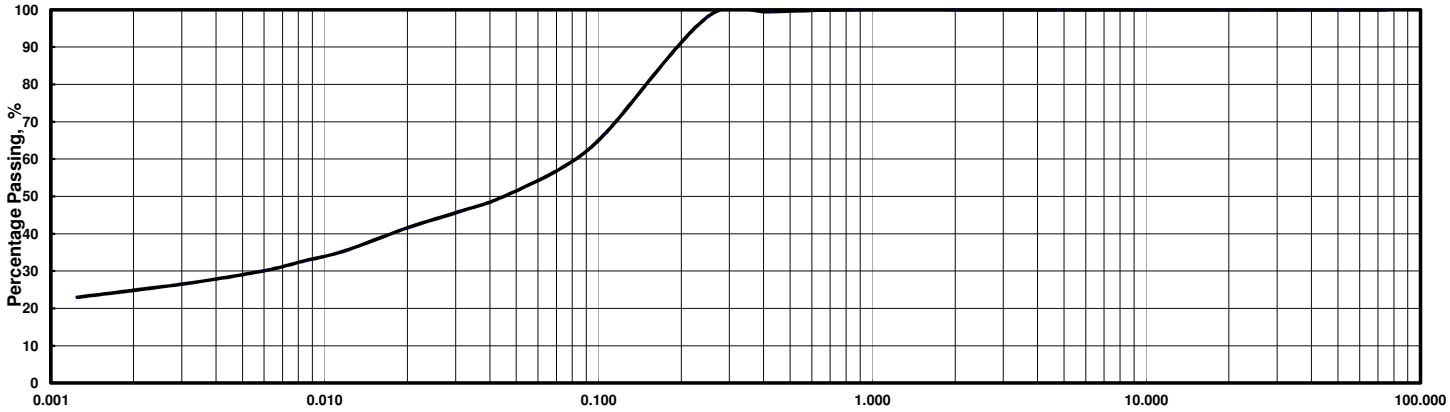
Sample No. : **LD2-12-1a D-2** Depth : **9.00-9.70m** ( ) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	98.1	67.0	58.1
Hydro.	Dia., mm	0.043	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0012							
	% Passing	49.5	46.0	41.5	35.4	32.7	30.0	26.5	23.0							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-12-1a D-2 9.00-9.85m			Sample No. Depth	LD2-12-1a D-2 9.00-9.85m		
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.081	mm	
2.00 - 0.425 mm	0.6	%		Dia. at 30%	0.0059	mm	
0.425 - 0.075 mm	41.3	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	29.2	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	28.9	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	100.0	%					
75um Sieve Passing	58.1	%					

Kiso-Jiban Consultants Co., Ltd.

300

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **18.11.14** Tested By : **Motiur** Checked by : **A. B. Tan**

Sample No. : **LD2-12-1a D-3** Depth : **12.30-12.80m** ( ) Specific Gravity : 2.67

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	98.9	89.2	33.2	9.1	8.3
Hydro.	Dia., mm															
	% Passing															

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves

Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE		FINE	COARSE	
		SAND		GRAVEL		

Sample No. Depth	LD2-12-1a D-3 12.30-12.80m			Sample No. Depth	LD2-12-1a D-3 12.30-12.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm
4.75 - 2.00 mm	0.4	%		Dia. at 60%	0.32	mm
2.00 - 0.425 mm	10.4	%		Dia. at 30%	0.22	mm
0.425 - 0.075 mm	81.0	%		Dia. at 10%	0.11	mm
0.075 - 0.005 mm	8.3	%		Coeff. of Uniformity	2.95	
Smaller than 0.005 mm				Coeff. of Curvature	1.41	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	98.9	%				
75um Sieve Passing	8.3	%				

Kiso-Jiban Consultants Co., Ltd.

301

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **19.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

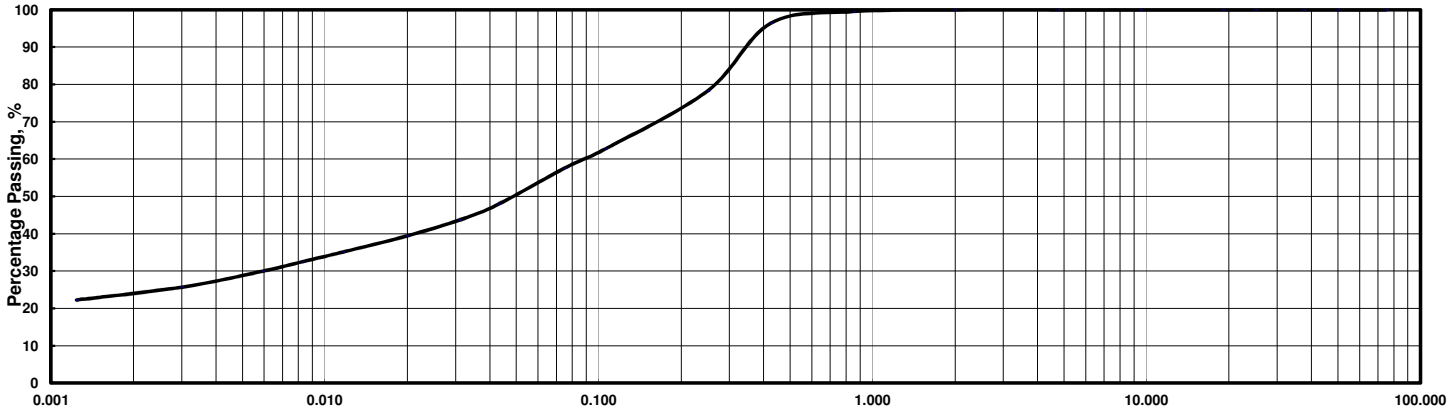
Sample No. : **LD2-12-1a D-3** Depth : **12.00-12.30m** ( ) Specific Gravity : 2.72

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.5	96.4	78.3	62.8	57.6
Hydro.	Dia., mm	0.043	0.031	0.020	0.012	0.0083	0.0059	0.0030	0.0012							
	% Passing	48.0	43.7	39.4	35.1	32.5	30.0	25.7	22.3							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-12-1a D-3 12.00-12.30m		Sample No. Depth	LD2-12-1a D-3 12.00-12.30m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.088 mm	
2.00 - 0.425 mm	3.6 %		Dia. at 30%	0.0059 mm	
0.425 - 0.075 mm	38.8 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	29.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	28.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.5 %				
75um Sieve Passing	57.6 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **19.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

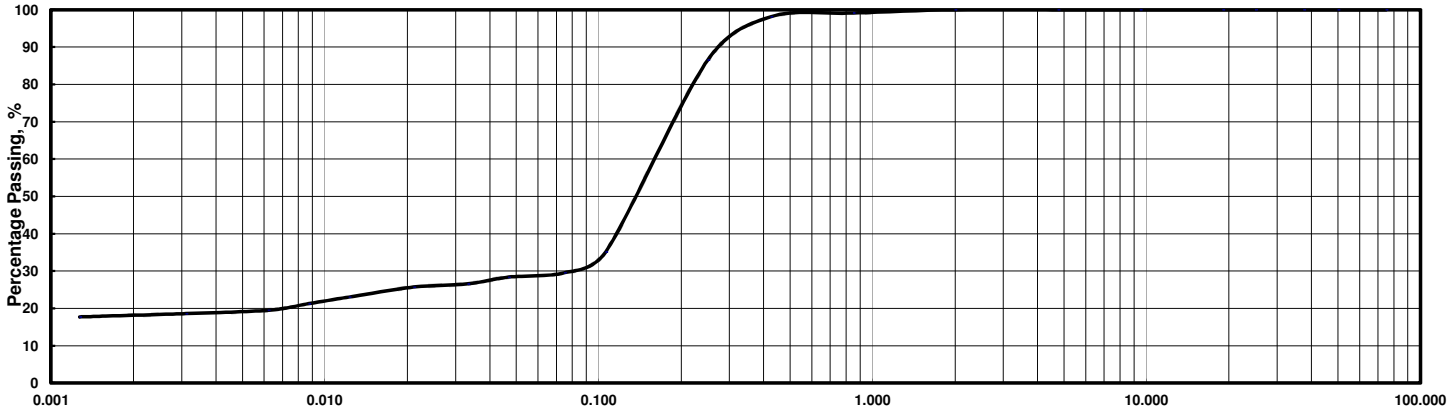
Sample No. : **LD2-12-1a D-4** Depth : **15.00-15.70m** ( ) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1	98.1	86.5	35.1	29.6
Hydro.	Dia., mm	0.047	0.033	0.021	0.012	0.0087	0.0062	0.0031	0.0013							
	% Passing	28.4	26.6	25.7	23.0	21.3	19.5	18.6	17.7							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

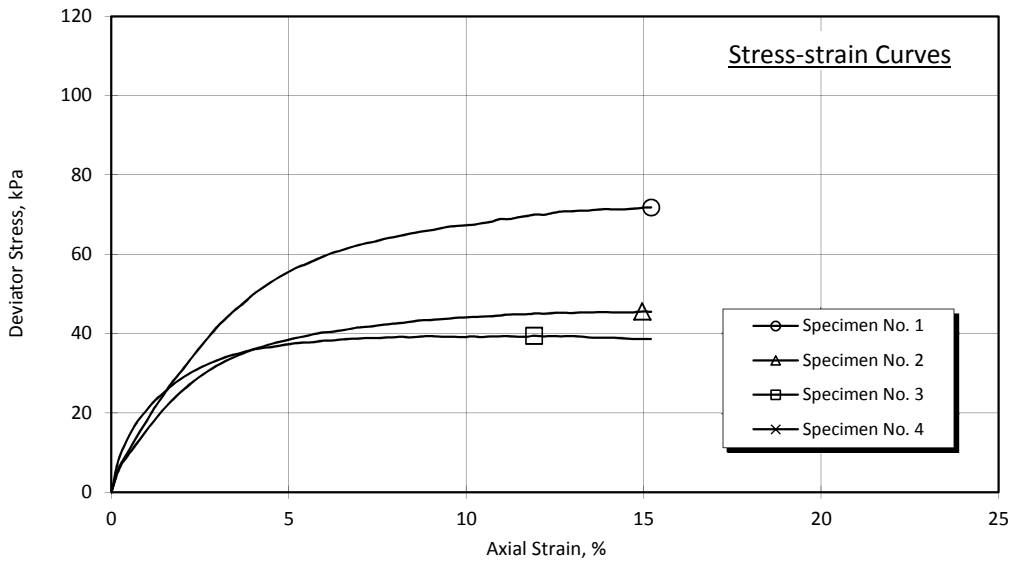
0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-12-1a D-4 15.00-15.70m		Sample No. Depth	LD2-12-1a D-4 15.00-15.70m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.16 mm	
2.00 - 0.425 mm	1.9 %		Dia. at 30%	0.077 mm	
0.425 - 0.075 mm	68.5 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	10.4 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	19.2 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.1 %				
75um Sieve Passing	29.6 %				

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

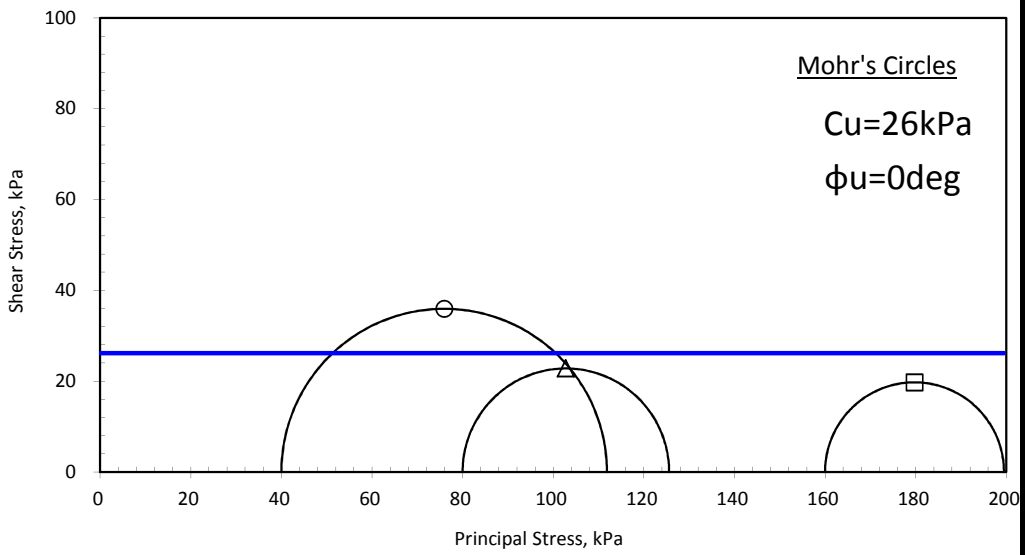
Project :	Preparatory Survey on Matarbari USC Coral-fired Power Project	Project No. :	S27-14
Standard :	ASTM D2850-03a	Date of Testing :	17.11.14
Borehole No.:	LD2-12-1a Depth : 2.00-2.90m	Tested by :	Perera
Sample No. :	HP-1 Strain Rate 1.00 %/min	Checked by :	A. B. Tan

Specimen No.	Condition of Sample	Size of Specimen (mm)		Natural Water Content	Bulk Density	Dy Density	Cell Pressure	Peak Deviator Stress	Modulus of Deformation	Corrected Initial Strain	Strain at Failure
		Height	Diameter	(%)	(Mg/m3)	(Mg/m3)	(kPa)	(kPa)	E50 (kPa)	(%)	(%)
1	Undisturbed	99.80	50.00	29.1	1.90	1.48	40	71.8	1472	N/A	15.21
2	Undisturbed	99.80	50.00	34.4	1.88	1.40	80	45.6	1367	N/A	14.96
3	Undisturbed	99.80	50.10	39.6	1.80	1.29	160	39.5	2182	N/A	11.91
4											



After shearing (Spec. 1)

After shearing (Spec. 2)

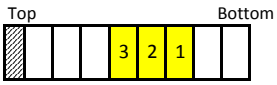


After shearing (Spec. 3)

After shearing (Spec. 4)

Remarks :
- [Strain at failure]=[Recorded strain at failure] - [Corrected Initial Strain]
- Latex membrane with 0.2mm in thickness is used.
- Membrane correction is carried out based on BS 1377 : 1990

Portion Tested

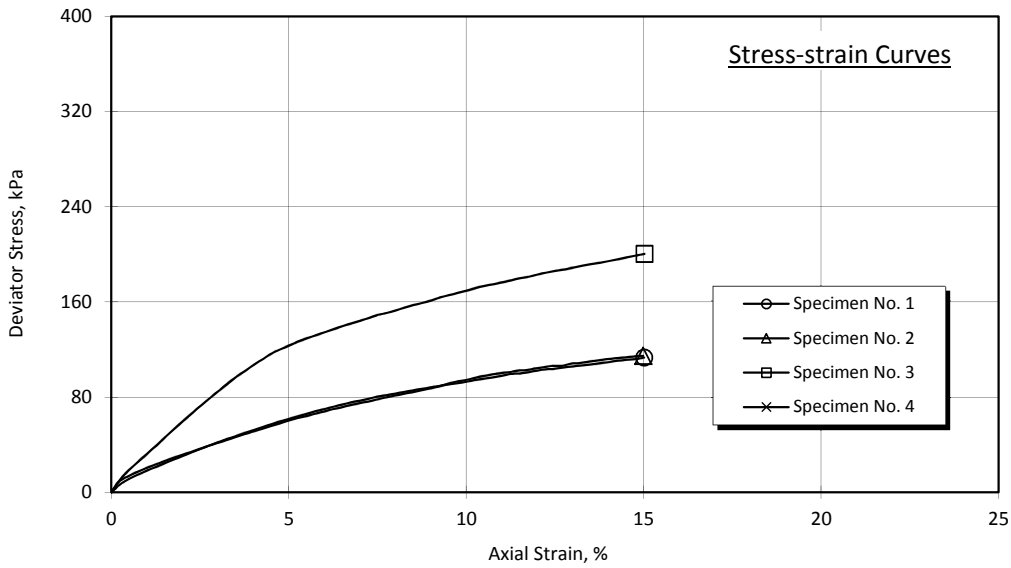


Kiso-Jiban Consultants Co Ltd
Singapore Branch

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

Project :	Preparatory Survey on Matarbari USC Coral-fired Power Project	Project No. :	S27-14
Standard :	ASTM D2850-03a	Date of Testing :	17.11.14
Borehole No.:	LD2-12-1a Depth :9.00-9.70m	Tested by :	Perera
Sample No. :	D-2 Strain Rate 1.00 %/min	Checked by :	A. B. Tan

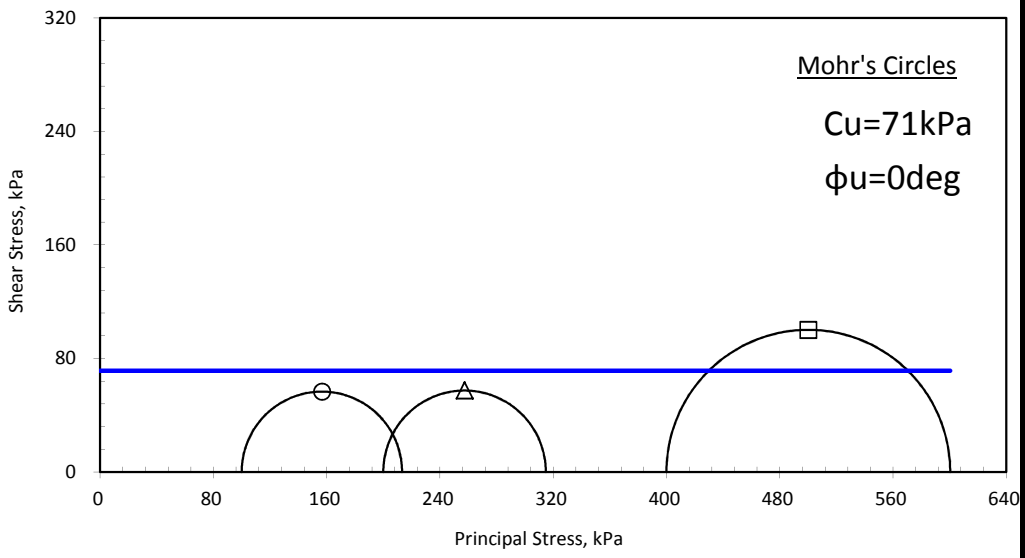
Specimen No.	Condition of Sample	Size of Specimen (mm)		Natural Water Content	Bulk Density	Dy Density	Cell Pressure	Peak Deviator Stress	Modulus of Deformation	Corrected Initial Strain	Strain at Failure
		Height	Diameter	(%)	(Mg/m3)	(Mg/m3)	(kPa)	(kPa)	E50 (kPa)	(%)	(%)
1	Undisturbed	99.80	50.00	28.6	1.95	1.52	100	113.2	1276	N/A	15.01
2	Undisturbed	99.80	50.00	29.9	1.91	1.47	200	114.7	1227	N/A	14.98
3	Undisturbed	99.80	50.10	24.7	1.94	1.56	400	200.4	2724	N/A	15.02
4											



After shearing (Spec. 1)

After shearing (Spec. 2)

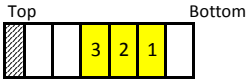
After shearing (Spec. 3)



After shearing (Spec. 4)

Remarks :
- [Strain at failure]=[Recorded strain at failure] - [Corrected Initial Strain]
- Latex membrane with 0.2mm in thickness is used.
- Membrane correction is carried out based on BS 1377 : 1990

Portion Tested



Kiso-Jiban Consultants Co Ltd
Singapore Branch

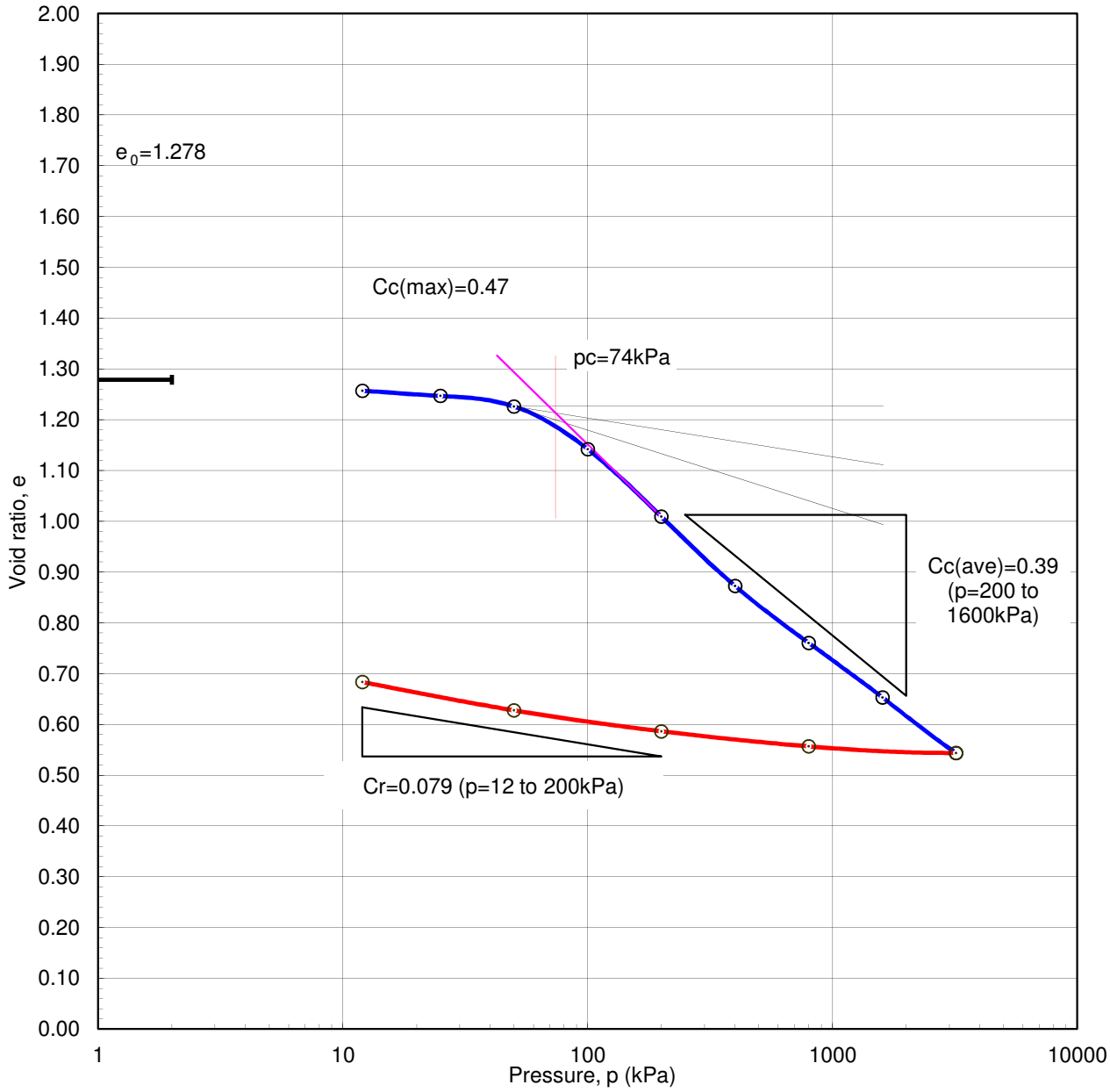
305

CONSOLIDATION TEST (e-log p curves)

Preparatory Survey on Matarbari USC Coal-fired Power

Project :	Project			Borehole No. :	LD2-12-1a
Project No.:	S27-14	Tested by :	Lim	Sample No. :	HP-1
Soil Type :	Clay with Sand	Checked by :	A. B. Tan	Depth of Sample :	2.00-2.90 m

Sample No.	Depth of sample (m)	Initial void ratio e_o	Preconsolidation Pressure, p_c (kPa)	Compression Index Cc		Swell Index Cr	Unload-reload-Compression Index Cur
HP-1	2.00-2.90	1.278	74	0.47 (max)	0.39(average)	0.079 (average)	N/A

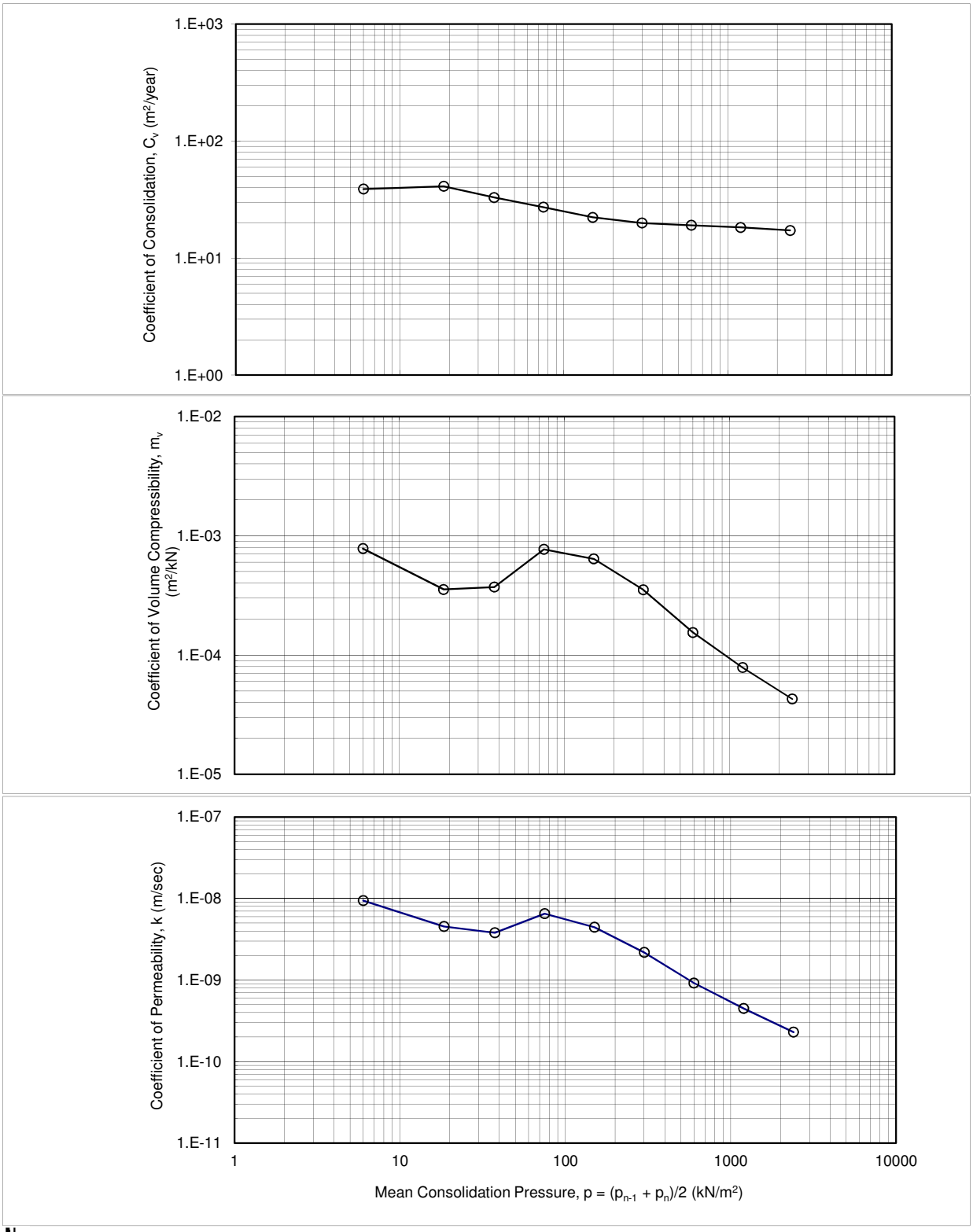


KISO-JIBAN CONSULTANTS CO., LTD.

306

Consolidation Test (p - $\overline{c}v$, mv , k curves)

Project :	Preparatory Survey on Matarbari USC Coal-fired Power Project			Borehole No. :	LD2-12-1a
Project No. :	S27-14			Sample No. :	HP-1
Date of testing :	17-Nov-14	Tested by :	Lim	Depth of Sample :	2.00-2.90 m



KISO-JIBAN CONSULTANTS CO., LTD.

PROJECT NAME : Preparatory Survey on Matarbari USC Coal-fired Power Project
PROJECT NO. : S27-14
BOREHOLE NO. : LD2-12-1a
TESTING STANDARD : ASTM D2435-11
DATE : 17-Nov-14
SAMPLE NO. : HP-1
INITIAL HEIGHT OF SPECIMEN : 18.000 mm
NO. OF LOADING STEP : 9
DEPTH : 2.00-2.90 m
DIAMETER OF SPECIMEN : 53.900 mm
SPECIFIC GRAVITY : 2.74
TESTER NO. : 29
DRY WEIGHT OF SPECIMEN : 49.360 grams
SOLID HEIGHT OF SPECIMEN : 7.900 mm
INITIAL MOISTURE CONTENT : 42.6 %
BULK DENSITY : 1.74 Mg/m^3
METHOD OF TIME FITTING USED : SQUARE ROOT TIME CURVE - FITTING METHOD
LABORATORY TEMPERATURE : 23.0 ^oC

PRESSURE kN/m^2	PRESSURE INCREMENT kN/m^2	CHANGE IN HEIGHT *E-2 mm	HEIGHT mm	AVERAGE HEIGHT mm	STRAIN %	MV m^2/kN	VOLUME RATIO	VOID RATIO
0.000			18.000				2.278	1.278
	12.000	16.8		17.916	0.94	7.81E-04		
12.000			17.832				2.257	1.257
	13.000	8.2		17.791	0.46	3.55E-04		
25.000			17.750				2.247	1.247
	25.000	16.4		17.668	0.93	3.71E-04		
50.000			17.586				2.226	1.226
	50.000	66.4		17.254	3.85	7.70E-04		
100.000			16.922				2.142	1.142
	100.000	105.0		16.397	6.40	6.40E-04		
200.000			15.872				2.009	1.009
	200.000	107.9		15.333	7.04	3.52E-04		
400.000			14.793				1.873	0.873
	400.000	88.7		14.350	6.18	1.55E-04		
800.000			13.906				1.760	0.760
	800.000	84.7		13.483	6.28	7.85E-05		
1600.000			13.059				1.653	0.653
	1600.000	86.3		12.628	6.83	4.27E-05		
3200.000			12.196				1.544	0.544

PRESSURE kN/m^2	AVERAGE PRESSURE kN/m^2	T90 min	CV m^2/sec	CV m^2/day	CV m^2/year	PRIMARY COMPRESSION *E-2 mm	PRIMARY COMPRESSION RATIO	COEFFICIENT OF PERMEABILITY m/sec
0.000								
	6.000	0.86	1.23E-06	1.07E-01	3.89E+01	2.8	0.166	9.45E-09
12.000								
	18.500	0.80	1.30E-06	1.13E-01	4.11E+01	1.3	0.162	4.53E-09
25.000								
	37.500	0.98	1.04E-06	9.02E-02	3.29E+01	1.8	0.158	3.80E-09
50.000								
	75.000	1.13	8.63E-07	7.46E-02	2.72E+01	17.4	0.243	6.52E-09
100.000								
	150.000	1.25	7.06E-07	6.10E-02	2.23E+01	42.3	0.403	4.43E-09
200.000								
	300.000	1.22	6.32E-07	5.46E-02	1.99E+01	41.3	0.383	2.18E-09
400.000								
	600.000	1.12	6.04E-07	5.22E-02	1.91E+01	33.2	0.375	9.16E-10
800.000								
	1200.000	1.03	5.80E-07	5.01E-02	1.83E+01	29.9	0.352	4.47E-10
1600.000								
	2400.000	0.96	5.46E-07	4.72E-02	1.72E+01	24.0	0.278	2.29E-10
3200.000								

REBOUND

P	800.000	200.000	50.000	12.000
H	12.298	12.533	12.858	13.299
E	0.557	0.586	0.628	0.683

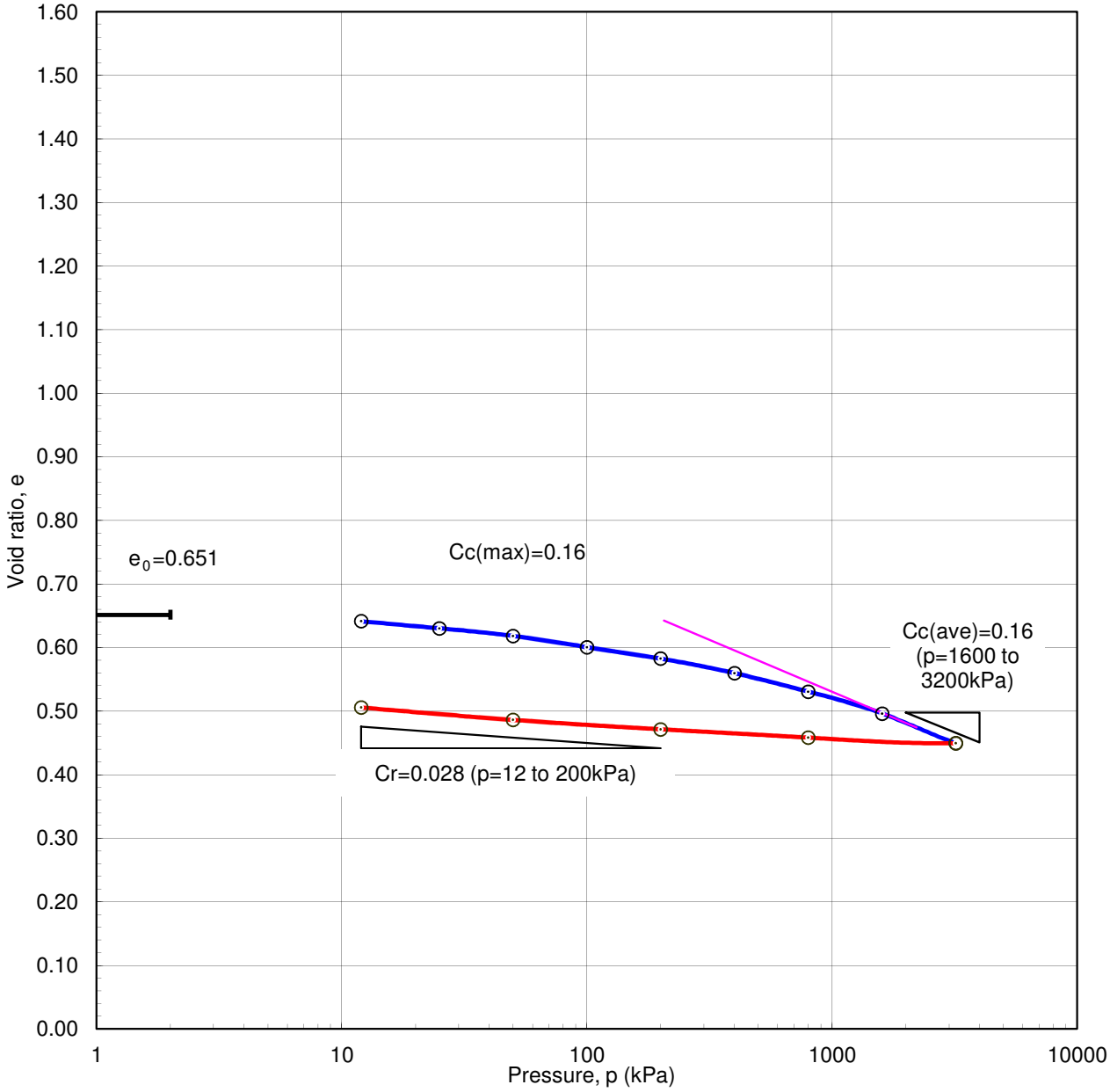
KISO-JIBAN CONSULTANTS CO., LTD.

CONSOLIDATION TEST (e-log p curves)

Preparatory Survey on Matarbari USC Coal-fired Power

Project :	Project			Borehole No. :	LD2-12-1a
Project No.:	S27-14	Tested by :	Lim	Sample No. :	D-2
Soil Type :	Sandy Clay	Checked by :	A. B. Tan	Depth of Sample :	9.00-9.70 m

Sample No.	Depth of sample (m)	Initial void ratio e_o	Preconsolidation Pressure, p_c (kPa)	Compression Index Cc		Swell Index Cr	Unload-reload-Compression Index Cur
D-2	9.00-9.85	0.651	-	0.16 (max)	0.16(average)	0.028 (average)	N/A

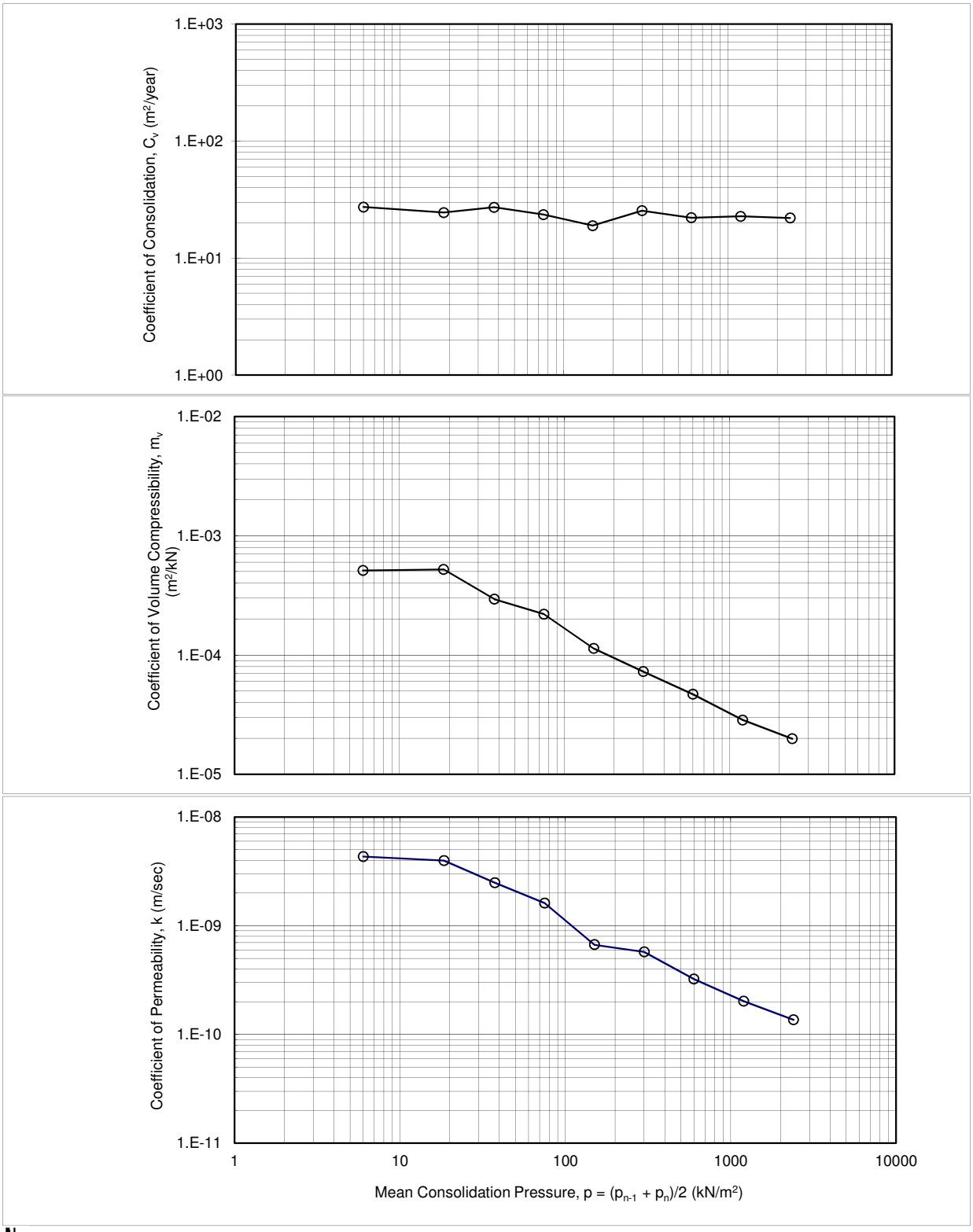


KISO-JIBAN CONSULTANTS CO., LTD.

309

Consolidation Test (p - $\overline{c}v$, mv , k curves)

Project :	Preparatory Survey on Matarbari USC Coal-fired Power Project			Borehole No. :	LD2-12-1a
Project No. :	S27-14			Sample No. :	D-2
Date of testing :	17-Nov-14	Tested by :	Lim	Depth of Sample :	9.00-9.70 m



KISO-JIBAN CONSULTANTS CO., LTD.

PROJECT NAME : Preparatory Survey on Matarbari USC Coal-fired Power Project
PROJECT NO. : S27-14
BOREHOLE NO. : LD2-12-1a
TESTING STANDARD : ASTM D2435-11
DATE : 17-Nov-14
SAMPLE NO. : D-2
INITIAL HEIGHT OF SPECIMEN : 18.000 mm
NO. OF LOADING STEP : 9
DEPTH : 9.00-9.70 m
DIAMETER OF SPECIMEN : 53.900 mm
SPECIFIC GRAVITY : 2.71
TESTER NO. : 30
DRY WEIGHT OF SPECIMEN : 67.370 grams
SOLID HEIGHT OF SPECIMEN : 10.900 mm
INITIAL MOISTURE CONTENT : 22.1 %
BULK DENSITY : 2.01 Mg/m^3
METHOD OF TIME FITTING USED : SQUARE ROOT TIME CURVE - FITTING METHOD
LABORATORY TEMPERATURE : 23.0 ^oC

PRESSURE kN/m^2	PRESSURE INCREMENT kN/m^2	CHANGE IN HEIGHT *E-2 mm	HEIGHT mm	AVERAGE HEIGHT mm	STRAIN %	MV m^2/kN	VOLUME RATIO	VOID RATIO
0.000			18.000				1.651	0.651
	12.000	11.0		17.945	0.61	5.11E-04		
12.000			17.890				1.641	0.641
	13.000	12.1		17.830	0.68	5.22E-04		
25.000			17.769				1.630	0.630
	25.000	13.0		17.704	0.73	2.94E-04		
50.000			17.639				1.618	0.618
	50.000	19.3		17.543	1.10	2.20E-04		
100.000			17.446				1.601	0.601
	100.000	19.7		17.348	1.14	1.14E-04		
200.000			17.249				1.582	0.582
	200.000	24.9		17.125	1.45	7.27E-05		
400.000			17.000				1.560	0.560
	400.000	31.6		16.842	1.88	4.69E-05		
800.000			16.684				1.531	0.531
	800.000	37.6		16.496	2.28	2.85E-05		
1600.000			16.308				1.496	0.496
	1600.000	51.0		16.053	3.18	1.99E-05		
3200.000			15.798				1.449	0.449

PRESSURE kN/m^2	AVERAGE PRESSURE kN/m^2	T90 min	CV m^2/sec	CV m^2/day	CV $m^2/year$	PRIMARY COMPRESSION *E-2 mm	PRIMARY COMPRESSION RATIO	COEFFICIENT OF PERMEABILITY m/sec
0.000								
	6.000	1.22	8.64E-07	7.47E-02	2.73E+01	2.0	0.182	4.33E-09
12.000								
	18.500	1.35	7.77E-07	6.71E-02	2.45E+01	2.0	0.166	3.98E-09
25.000								
	37.500	1.20	8.62E-07	7.44E-02	2.72E+01	2.2	0.166	2.48E-09
50.000								
	75.000	1.35	7.47E-07	6.45E-02	2.36E+01	3.1	0.158	1.61E-09
100.000								
	150.000	1.65	6.00E-07	5.18E-02	1.89E+01	2.9	0.145	6.68E-10
200.000								
	300.000	1.20	8.06E-07	6.96E-02	2.54E+01	3.0	0.119	5.75E-10
400.000								
	600.000	1.33	7.02E-07	6.06E-02	2.21E+01	3.7	0.117	3.23E-10
800.000								
	1200.000	1.24	7.22E-07	6.23E-02	2.28E+01	4.7	0.124	2.02E-10
1600.000								
	2400.000	1.21	6.98E-07	6.03E-02	2.20E+01	5.2	0.101	1.36E-10
3200.000								

REBOUND

P	800.000	200.000	50.000	12.000
H	15.895	16.038	16.199	16.411
E	0.458	0.471	0.486	0.506

KISO-JIBAN CONSULTANTS CO., LTD.

Summary of Consolidated Drained Triaxial Compression Test

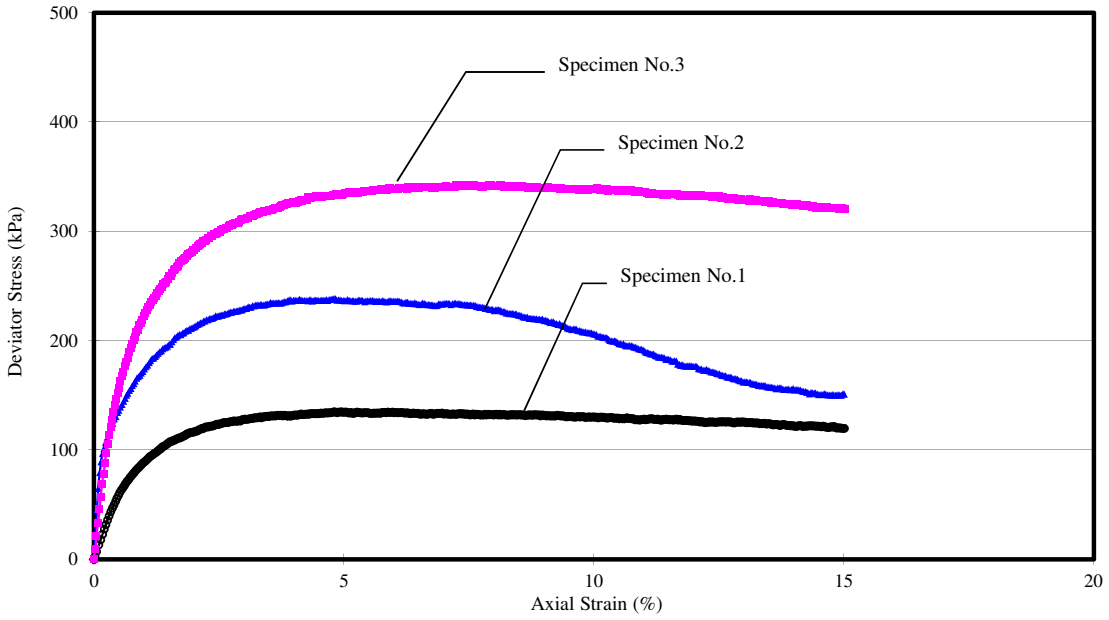
Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 13.12.14		Tested by : Perera		Checked by : A. B. Tan			
Borehole No.: LD2-12-1a		Sample No.:D-1		Depth : 6.00-6.70m			
Specimen Condition : Remoulded		Test Method : ASTM D7181-11					
Soil Description : Sand with Clay		Ave. Diameter : 50.0mm		Ave. Height : 100.0mm			
Specimen No.			1	2	3	4	
Initial Condition	Saturated Wet Density,	Mg/m^3	1.95	1.95	1.95		
	Water Content,	%	29.5	29.5	29.5		
	Dry Density	Mg/m^3	1.51	1.51	1.51		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	570	600		
	B-value		0.95	0.98	0.96		
Consolidation Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	529	559	586		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.08	0.10	0.12		
	Coefficient of Consolidation Cv,	m^2/year	381	194	267		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.020	0.015	0.012		
Compression Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	135	239	343		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-0.86	-0.88	-1.19		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	4.80	4.80	8.14		
Shear Strength Parameters	ϕ_d = 39 Degree c_d = 0 kPa		Mode of Failure				
			1	2	3	4	
Remarks : Specimens are prepared at required saturated wet density = 1.95 Mg/m3							

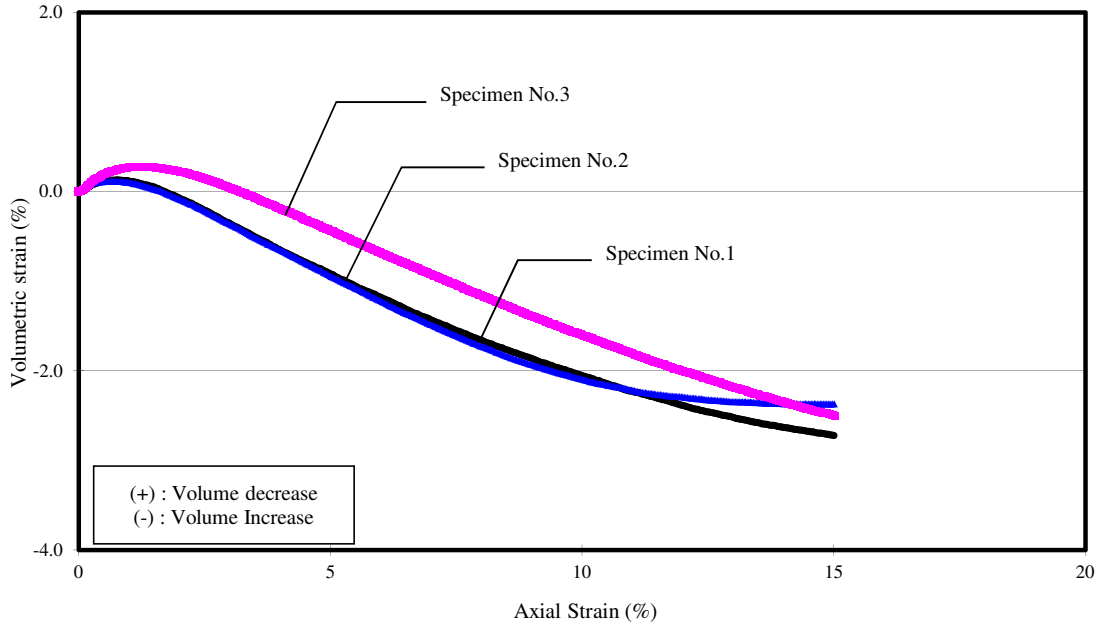
Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No.: S27-14 Sample No.: D-1 Soil Type: Sand with Clay

Borehole No.: LD2-12-1a Depth : 6.00-6.70mm





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

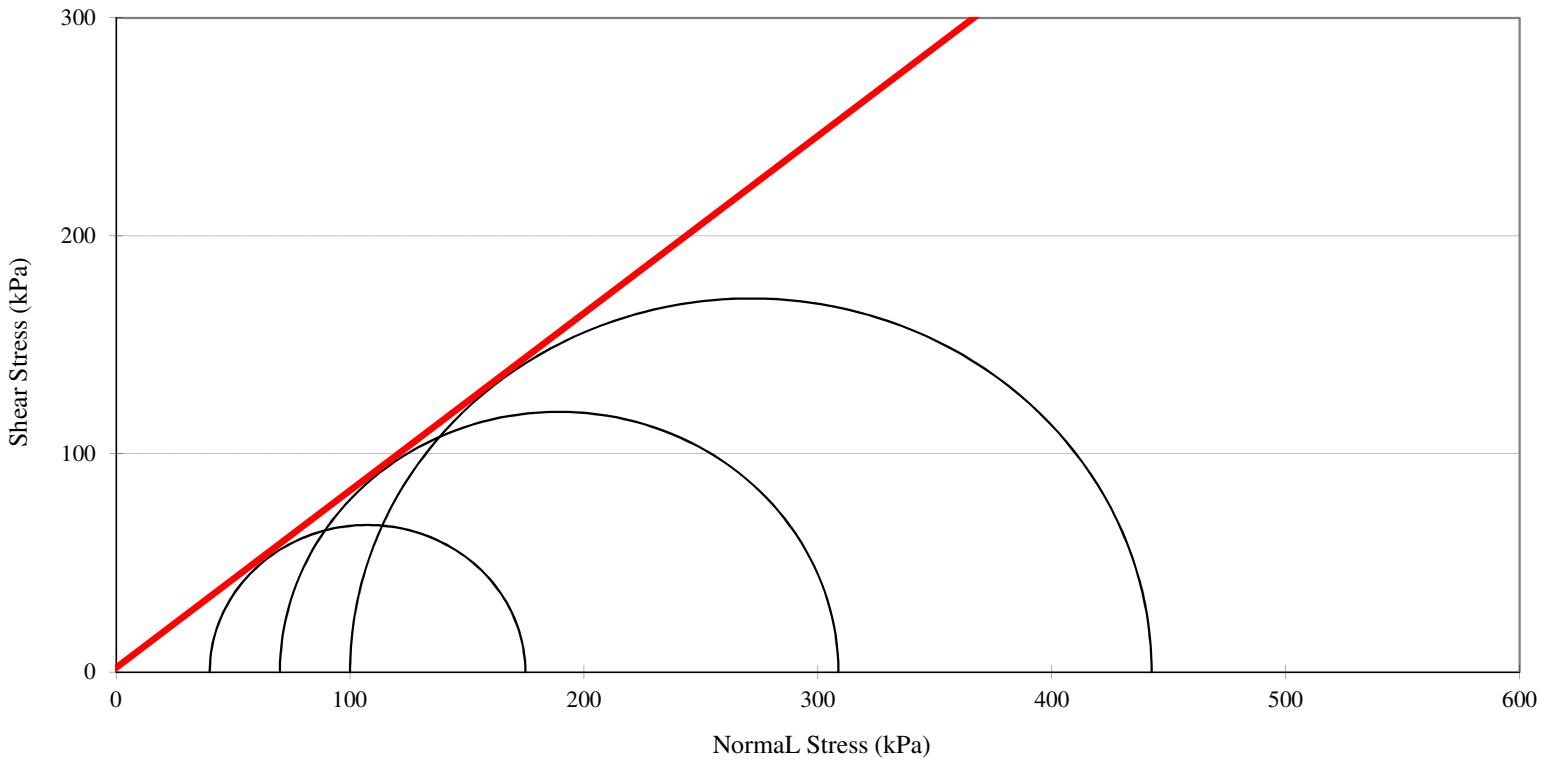
Project No. : S27-14

Borehole No. : LD2-12-1a Soil Type: Sand with Clay

Sample No. : D-1 Depth : 6.00-6.70m

Angle of Internal Friction, ϕ_d 39 deg

Cohesion, c_d 0 kPa



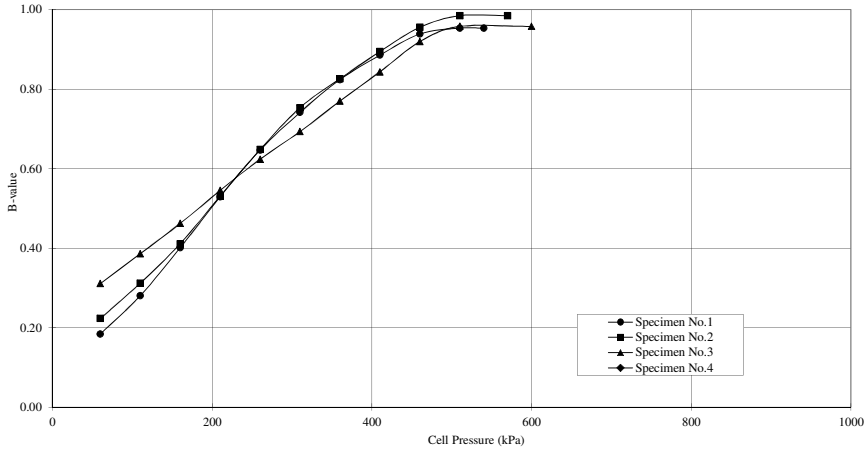
Kiso-Jiban Consultants Co., Ltd.

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: LD2-12-1a
Sample No.: D-1

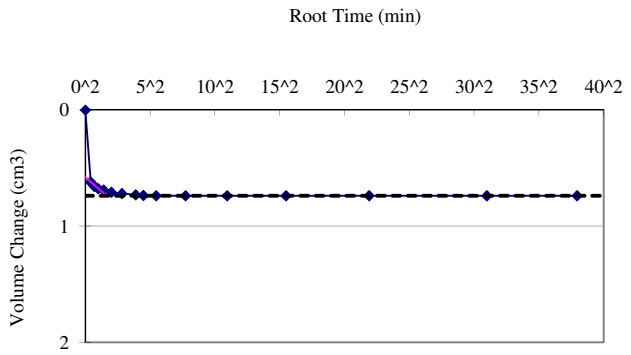
Depth : 6.00-6.70m
Soil Type: Sand with Clay

		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	25.5	20	26.7	20	29.3		
	Back Pressure (kPa)	20		20		20			
	B-value	0.18		0.22		0.31			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	64.0	50	65.6	50	69.3		
	Back Pressure (kPa)	50		50		50			
	B-value	0.28		0.31		0.39			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	120.1	100	120.6	100	123.1		
	Back Pressure (kPa)	100		100		100			
	B-value	0.40		0.41		0.46			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	176.5	150	176.5	150	177.3		
	Back Pressure (kPa)	150		150		150			
	B-value	0.53		0.53		0.55			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	232.3	200	232.4	200	231.2		
	Back Pressure (kPa)	200		200		200			
	B-value	0.65		0.65		0.62			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	287.1	250	287.7	250	284.7		
	Back Pressure (kPa)	250		250		250			
	B-value	0.74		0.75		0.69			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	341.2	300	341.3	300	338.5		
	Back Pressure (kPa)	300		300		300			
	B-value	0.82		0.83		0.77			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	394.3	350	394.7	350	392.2		
	Back Pressure (kPa)	350		350		350			
	B-value	0.89		0.89		0.84			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	446.9	400	447.8	400	446.0		
	Back Pressure (kPa)	400		400		400			
	B-value	0.94		0.96		0.92			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	497.7	450	499.2	450	497.9		
	Back Pressure (kPa)	450		450		450			
	B-value	0.95		0.98		0.96			
B-check Step.11	Cell Pressure (kPa)	510	540	510	570	510	600		
	P.W.P (kPa)	500	528.6	500	559.1	500	586.2		
	Back Pressure (kPa)	500		500		500			
	B-value	0.95		0.98		0.96			



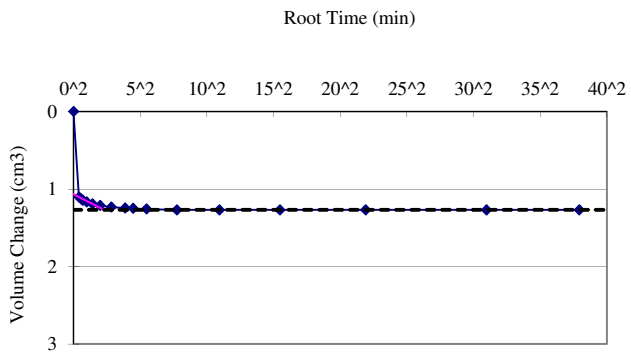
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: LD2-12-1a Soil Type: Sand with Clay
Sample No.: D-1 Depth : 6.00-6.70m



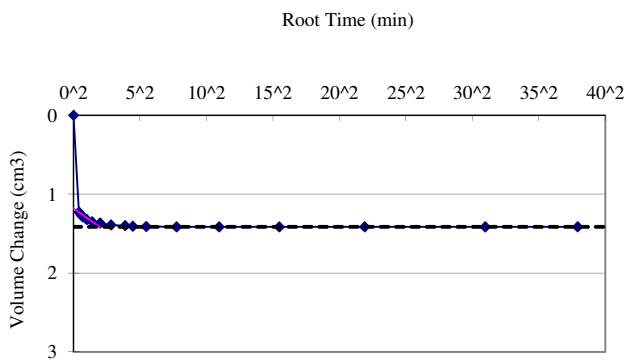
Specimen No.: 1

p' =	40	kPa
t100 =	2.7	min
Cv =	381	m^2/year
mvi=	0.020	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	5.3	min
Cv =	194	m^2/year
mvi=	0.015	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	3.9	min
Cv =	267	m^2/year
mvi=	0.012	m^2/MN

Summary of Consolidated Drained Triaxial Compression Test

Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 13.12.14		Tested by : Perera		Checked by : A. B. Tan			
Borehole No.: LD2-12-1a		Sample No.:D-3B		Depth : 12.30-12.80m			
Specimen Condition : Remoulded		Test Method : ASTM D7181-11					
Soil Description : Sand with Clay		Ave. Diameter : 50.0mm		Ave. Height : 100.0mm			
Specimen No.			1	2	3	4	
Initial Condition	Saturated Wet Density,	Mg/m^3	1.90	1.90	1.90		
	Water Content,	%	32.1	32.1	32.1		
	Dry Density	Mg/m^3	1.44	1.44	1.44		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	550	600	650		
	B-value		0.96	0.96	0.95		
Consolidation Stage	Cell Pressure	kPa	550	600	650		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	538	586	633		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.09	0.15	0.19		
	Coefficient of Consolidation Cv,	m^2/year	286	303	344		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.018	0.015	0.012		
Compression Stage	Cell Pressure	kPa	550	600	650		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	50	100	150		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	154	283	421		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-0.21	0.15	0.68		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	9.17	11.14	12.48		
Shear Strength Parameters	ϕ_d = 36 Degree c_d = 0 kPa		Mode of Failure				
			1	2	3	4	

Remarks :

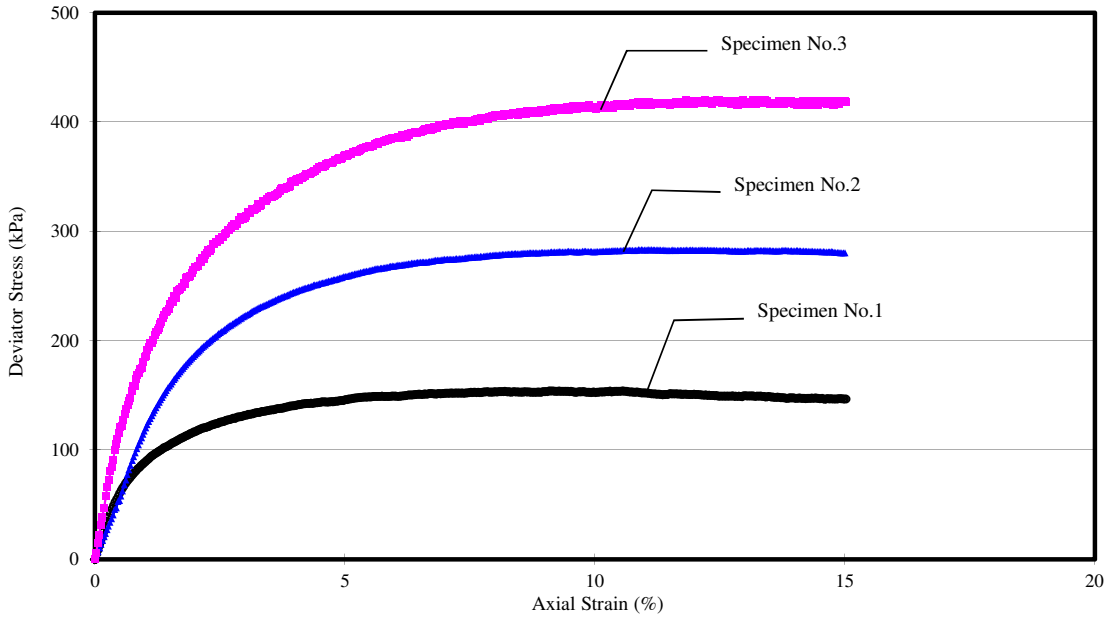
Specimens are prepared at required saturated wet density = 1.90 Mg/m3

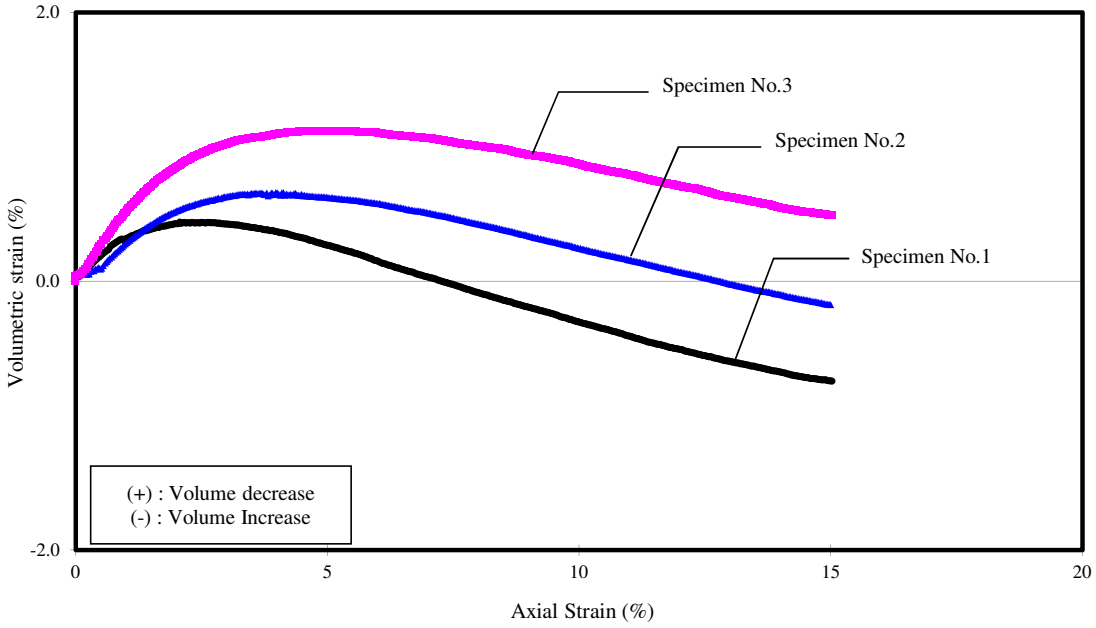
Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No.: S27-14 Sample No.: D-3B Soil Type: Sand with Clay

Borehole No.: LD2-12-1a Depth : 12.30-12.80mm





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

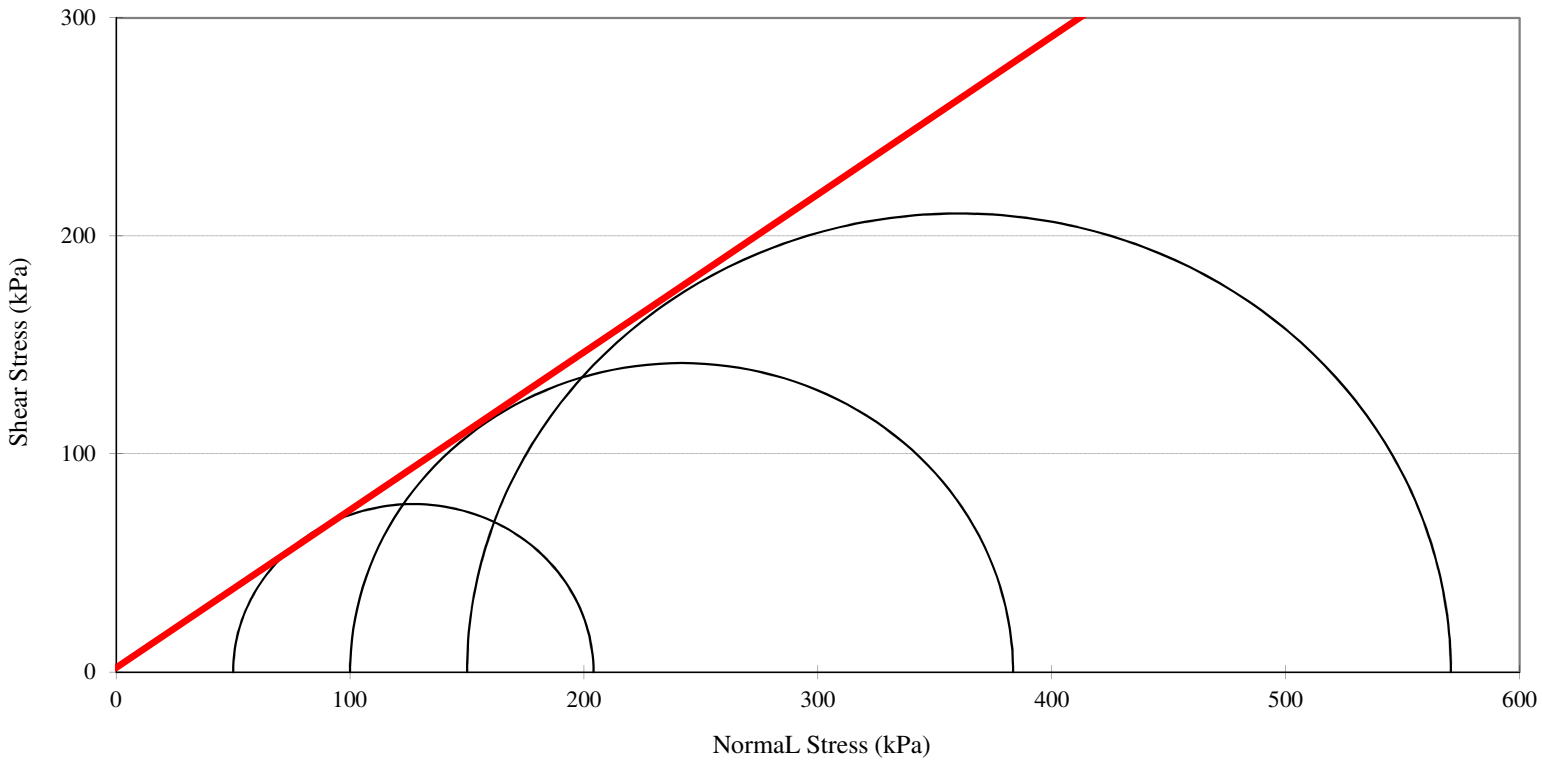
Project No. : S27-14

Borehole No. : LD2-12-1a Soil Type: Sand with Clay

Sample No. : D-3B Depth : 12.30-12.80m

Angle of Internal Friction, ϕ_d 36 deg

Cohesion, c_d 0 kPa



Kiso-Jiban Consultants Co., Ltd.

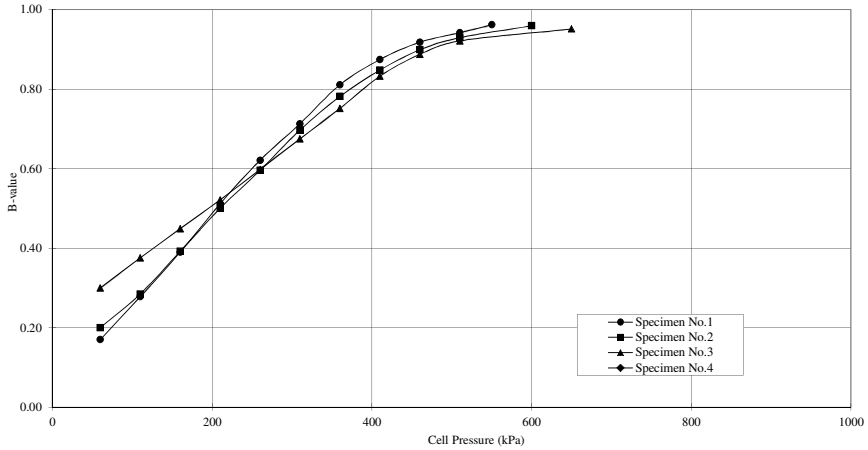
319

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: LD2-12-1a
Sample No.: D-3B

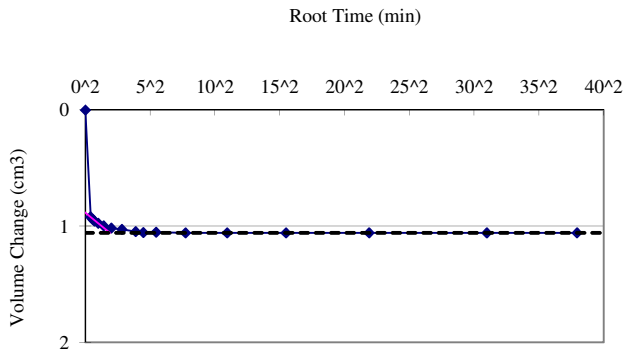
Depth : 12.30-12.80m
Soil Type: Sand with Clay

		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	25.1	20	26.0	20	29.0		
	Back Pressure (kPa)	20		20		20			
	B-value	0.17		0.20		0.30			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	63.9	50	64.2	50	68.8		
	Back Pressure (kPa)	50		50		50			
	B-value	0.28		0.28		0.38			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	119.5	100	119.6	100	122.4		
	Back Pressure (kPa)	100		100		100			
	B-value	0.39		0.39		0.45			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	175.6	150	175.0	150	176.1		
	Back Pressure (kPa)	150		150		150			
	B-value	0.51		0.50		0.52			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	231.1	200	229.8	200	229.9		
	Back Pressure (kPa)	200		200		200			
	B-value	0.62		0.60		0.60			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	285.6	250	284.8	250	283.8		
	Back Pressure (kPa)	250		250		250			
	B-value	0.71		0.70		0.68			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	340.5	300	339.1	300	337.6		
	Back Pressure (kPa)	300		300		300			
	B-value	0.81		0.78		0.75			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	393.7	350	392.4	350	391.6		
	Back Pressure (kPa)	350		350		350			
	B-value	0.87		0.85		0.83			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	445.9	400	444.9	400	444.4		
	Back Pressure (kPa)	400		400		400			
	B-value	0.92		0.90		0.89			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	497.1	450	496.5	450	496.1		
	Back Pressure (kPa)	450		450		450			
	B-value	0.94		0.93		0.92			
B-check Step.11	Cell Pressure (kPa)	510	550	510	600	510	650		
	P.W.P (kPa)	500	538.5	500	586.3	500	633.2		
	Back Pressure (kPa)	500		500		500			
	B-value	0.96		0.96		0.95			



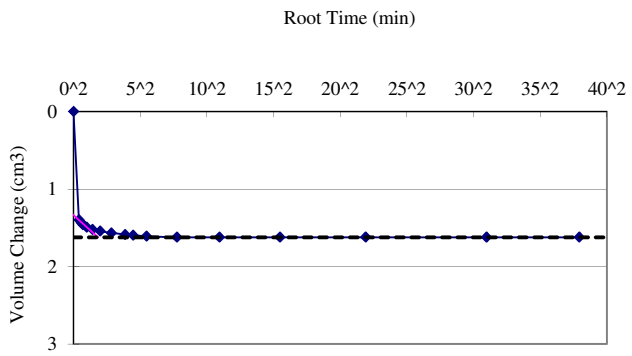
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: LD2-12-1a Soil Type: Sand with Clay
Sample No.: D-3B Depth : 12.30-12.80m



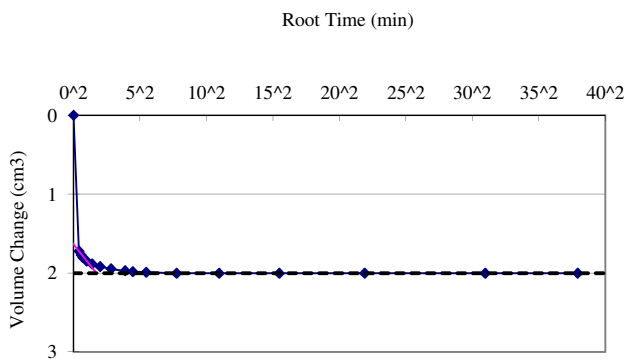
Specimen No.: 1

p' =	50	kPa
t100 =	3.6	min
Cv =	286	m^2/year
mvi=	0.018	m^2/MN



Specimen No.: 2

p' =	100	kPa
t100 =	3.4	min
Cv =	303	m^2/year
mvi=	0.015	m^2/MN



Specimen No.: 3

p' =	150	kPa
t100 =	3.0	min
Cv =	344	m^2/year
mvi=	0.012	m^2/MN

Summary of Consolidated Drained Triaxial Compression Test

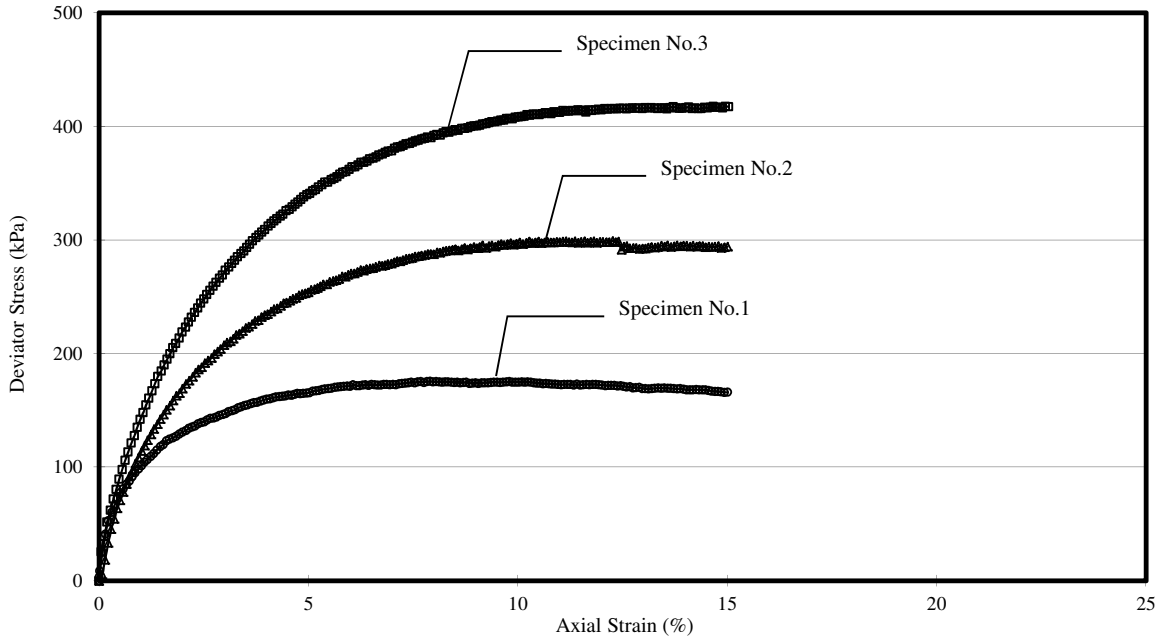
Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 13.12.14		Tested by : Perera		Checked by : A. B. Tan			
Borehole No.: LD2-12-1a		Sample No.:D-4		Depth :15.00-15.70m			
Specimen Condition : Remoulded		Test Method : ASTM D7181-11					
Soil Description : Clayey Sand		Ave. Diameter : 50.0mm		Ave. Height : 100.0mm			
	Specimen No.		1	2	3	4	
Initial Condition	Saturated Wet Density,	Mg/m^3	1.90	1.90	1.90		
	Water Content,	%	32.6	32.6	32.6		
	Dry Density	Mg/m^3	1.43	1.43	1.43		
Saturation Stage	Saturated PWP,	kPa	200	200	200		
	Final Cell Pressure,	kPa	250	300	350		
	B-value		0.95	0.96	0.96		
Consolidation Stage	Cell Pressure	kPa	250	300	350		
	Back Pressure	kPa	200	200	200		
	Initial PWP,	kPa	236	282	326		
	Final PWP	kPa	200	200	200		
Consolidation Parameter	Volume Change,	%	0.18	0.30	0.57		
	Coefficient of Consolidation Cv,	m^2/year	114.63	95.45	54.45		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.04	0.03	0.04		
Compression Stage	Cell Pressure	kPa	250	300	350		
	Back Pressure	kPa	200	200	200		
	Effective Cell Pressure	kPa	50	100	150		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	176	299	418		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-1.87	-1.17	-0.28		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	7.91	12.26	14.96		
Shear Strength Parameters	In terms of Effective Stress $\phi' = 36$ deg $c' = 0$ kPa		Mode of Failure				
			1	2	3	4	

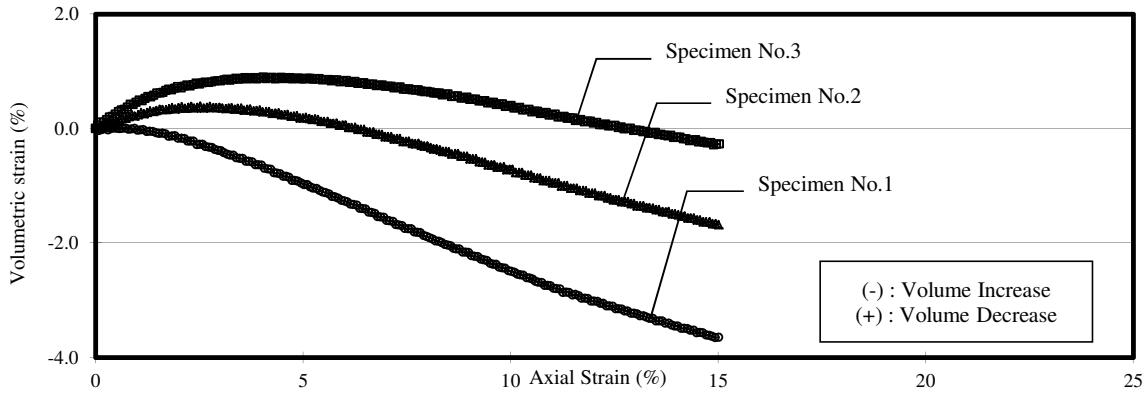
Remarks :

Specimens are prepared at required saturated wet density = 1.90 Mg/m3

Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-4 Soil Type: Clayey Sand
Borehole No.: LD2-12-1a Depth : 15.00-15.70m



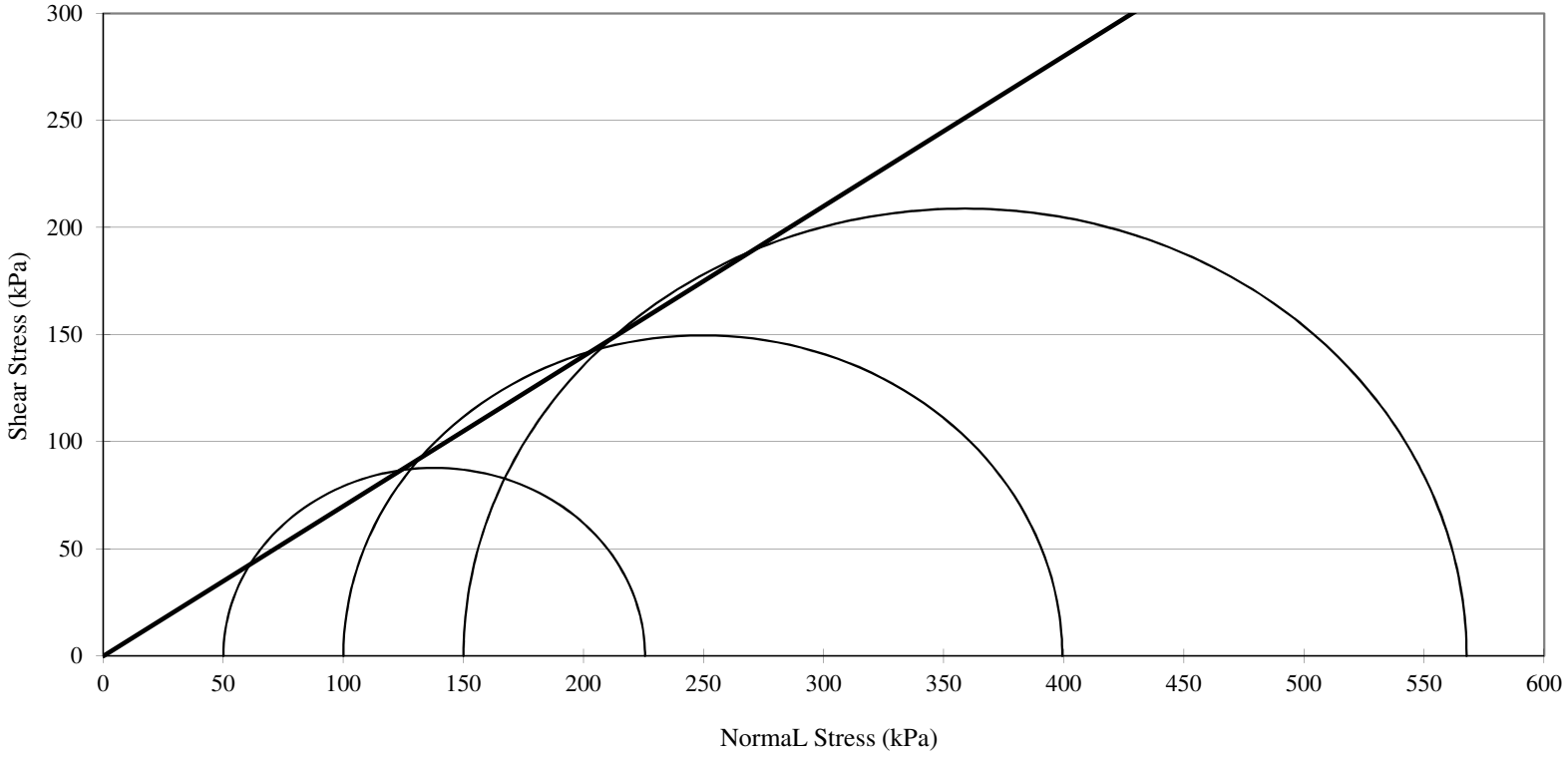


Consolidated Drained Triaxial Compression Test

- Mohr' s Circle (In terms of Total Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14

Borehole No. : LD2-12-1a Soil Type: Clayey Sand
Sample No. : D-4 Depth : 15.00-15.70m
Angle of Internal Friction, ϕ 35 deg
Cohesion, c 0 kPa

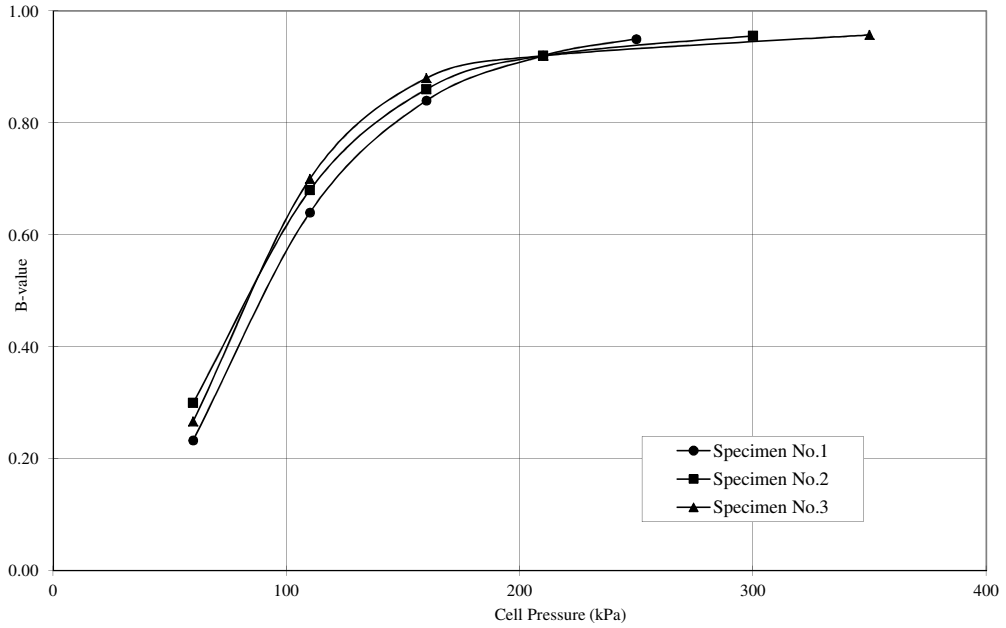


Kiso-Jiban Consultants Co., Ltd.

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

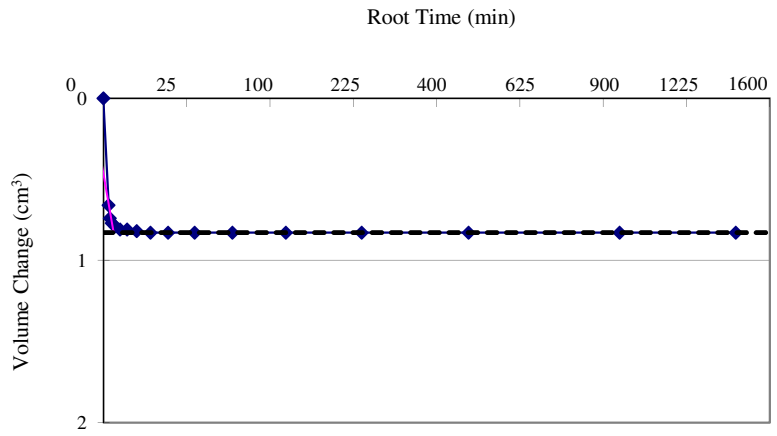
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: LD2-12-1a
Depth : 15.00-15.70m
Sample No.: D-4
Soil Type: Clayey Sand

		Result of B-value Check					
		Specimen 1		Specimen 2		Specimen 3	
		Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60
	P.W.P (kPa)	20	27	20	29	20	28
	Back Pressure (kPa)	20		20		20	
	B-value	0.23		0.30		0.27	
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110
	P.W.P (kPa)	50	82	50	84	50	85
	Back Pressure (kPa)	50		50		50	
	B-value	0.64		0.68		0.70	
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160
	P.W.P (kPa)	100	142	100	143	100	144
	Back Pressure (kPa)	100		100		100	
	B-value	0.84		0.86		0.88	
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210
	P.W.P (kPa)	150	196	150	196	150	196
	Back Pressure (kPa)	150		150		150	
	B-value	0.92		0.92		0.92	
B-check Step.5	Cell Pressure (kPa)	210	250	210	300	210	350
	P.W.P (kPa)	200	238	200	286	200	334
	Back Pressure (kPa)	200		200		200	
	B-value	0.95		0.96		0.96	

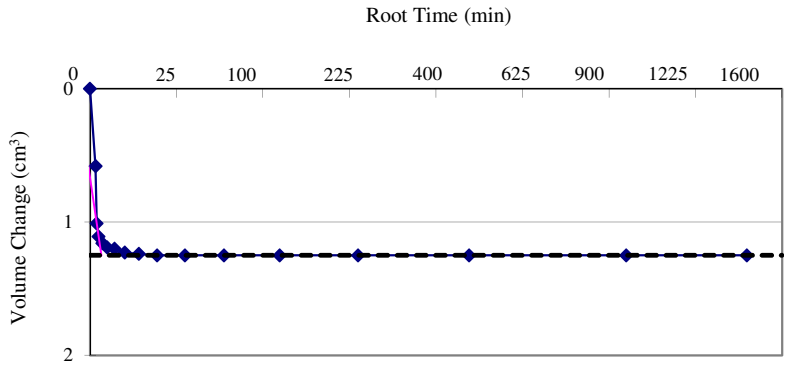


Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

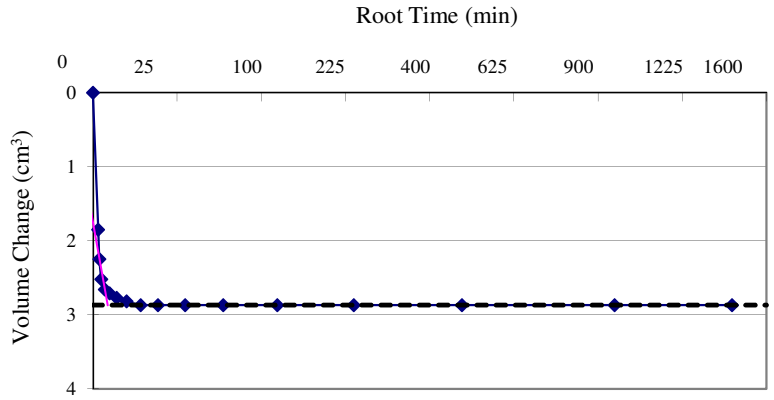
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-4 Soil Type: Clayey Sand
Borehole No.: LD2-12-1a Depth : 15.00-15.70m



Specimen No.: 1
p' = 50 kPa
t100 = 0.4 min
Cv = 114.63 m^2/year
mvi= 0.04 m^2/MN



Specimen No.: 2
p' = 100 kPa
t100 = 0.4 min
Cv = 95.45 m^2/year
mvi= 0.03 m^2/MN



Specimen No.: 3
p' = 150 kPa
t100 = 0.8 min
Cv = 54.45 m^2/year
mvi= 0.04 m^2/MN

22) LD2-12-1b

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.		LD2-12-1b							
Sample No.		D-1	HP-1Top	HP-1Bottom	D-2	D-3	D-4	D-5	D-6
Sample Depth		3.00m ~3.90m	6.00m ~6.60m	6.60m ~6.80m	9.00m ~9.65m	12.00m ~12.65m	15.00m ~15.90m	18.00m ~18.90m	22.00m ~22.90m
Condition of Sample		Disturbed	Undisturbed		Disturbed				
Natural Water Content	%	22.4	38.9	30.5	24.4	24.7	26.1	29.2	26.5
Specific Gravity		2.69	2.73	2.70	2.69	2.70	2.70	2.71	2.73
Wet Density	Mg/m^3	1.91	1.71	1.71	-	1.79	1.88	-	-
Dry Density	Mg/m^3	1.56	1.23	1.31	-	1.43	1.49	-	-
Natural Void Ratio		0.73	1.21	1.06	-	0.88	0.81	-	-
Degree of Saturation	%	83	88	78	-	76	87	-	-
Atterberg Limits	Liquid Limit, %	- *3	44	- *3	-	- *3	- *3	- *3	30
	Plastic Limit, %	- *3	24	- *3	-	- *3	- *3	- *3	18
	Plasticity Index, %	- *3	20	- *3	-	- *3	- *3	- *3	12
Grain Size Analysis	Gravel, %	0	0	0	0	0	0	0	0
	Sand, %	73	9	53	66	50	56	38	26
	Silt, %	10	47	19	14	30	21	37	40
	Clay & Colloid, %	17	44	28	20	20	23	25	34
	Max. diameter, mm	0.850	0.850	2.00	2.00	2.00	0.425	0.425	0.850
	Diam. at 60% mm	0.15	0.014	0.12	0.25	0.095	0.11	0.072	0.030
	Diam. at 10% mm	-	-	-	-	-	-	-	-
Visual soil description		Clayey Sand	Clay	Clayey Sand	Clayey Sand	Silty Sand	Clayey Sand	Sandy Silt	Clay with Sand
Unified soil classification		-	CL	-	-	-	-	-	CL
Triaxial compression test	Angle of Internal Friction (^{0})	-	-	-	-	-	-	-	-
	Cohesion Intercept, kPa	-	-	-	-	-	-	-	-
	Condition of drainage	-	-	-	-	-	-	-	-
	Angle of Internal Friction *2 (^{0})	-	-	-	36	-	-	-	-
	Cohesion Intercept, kPa *2	-	-	-	0	-	-	-	-
	Condition of drainage	-	-	-	CD*4	-	-	-	-
Consolidation Test	Preconsolidation Pressure, kPa	-	-	-	-	-	-	-	-
	Compression Index(Average)	-	-	-	-	-	-	-	-
	Pressure Range for Compression Index(kPa)	-	-	-	-	-	-	-	-
	Swell index	-	-	-	-	-	-	-	-
Compaction Test *4	Maximum Dry Density, Mg/m^3	-	-	-	1.85	-	-	-	-
	Optimum Moisture Content , %	-	-	-	12.4	-	-	-	-
Unconfined Compression Strength (kPa)		-	-	-	-	-	-	-	-
Strain at failure (%)		-	-	-	-	-	-	-	-

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

*4 : Samples are prepared at 90% of Maximum dry density

Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

328

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No. : S27-14

Standard : ASTM D4318-10

Date of Testing : 06.12.14

Tested By : Vasantha

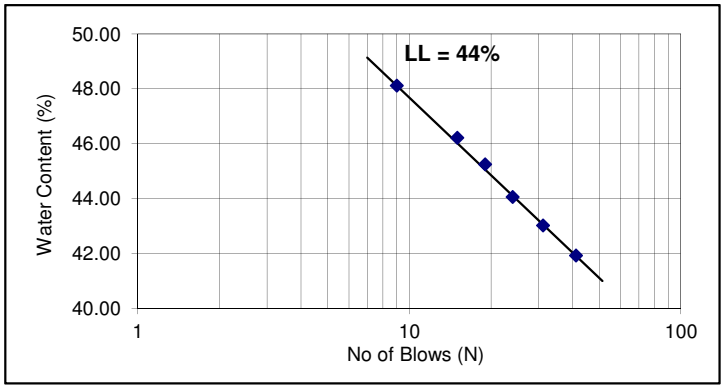
Checked By : A. B. Tan

Sample No. : LD2-12-1b HP-1

Depth : 6.00-6.60m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	41	41.92
2	31	43.03
3	24	44.06
4	19	45.25
5	15	46.21
6	9	48.11
Liquid Limits %		**44**
Plastic Limits %		**24**
Plasticity Index		**20**

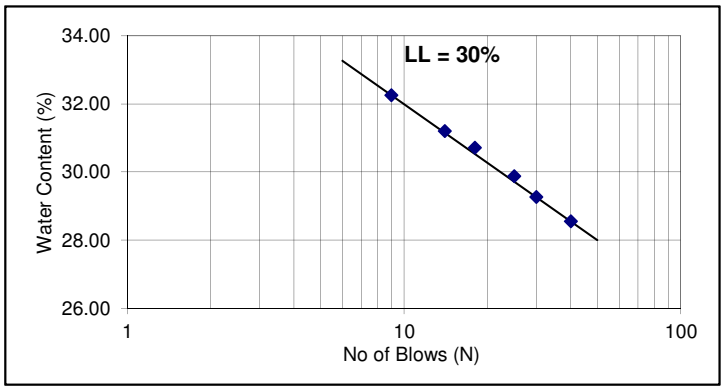


Sample No. : LD2-12-1b D-6

Depth : 22.00-22.90m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	40	28.55
2	30	29.26
3	25	29.88
4	18	30.71
5	14	31.20
6	9	32.26
Liquid Limits %		**30**
Plastic Limits %		**18**
Plasticity Index		**12**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

329

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **03.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

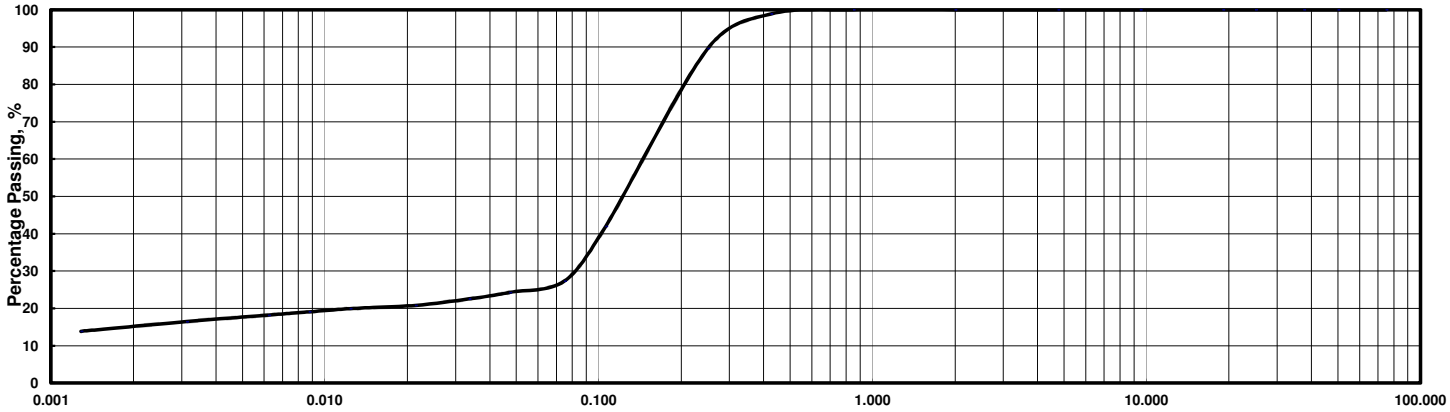
Sample No. : **LD2-12-1b D-1** Depth : **3.00-3.90m** ( ) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.8	89.6	42.0	27.3
Hydro.	Dia., mm	0.047	0.034	0.021	0.012	0.0088	0.0062	0.0031	0.0013							
	% Passing	24.3	22.5	20.8	19.9	19.1	18.2	16.5	13.9							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-12-1b D-1 3.00-3.90m			Sample No. Depth	LD2-12-1b D-1 3.00-3.90m		
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.15	mm	
2.00 - 0.425 mm	1.2	%		Dia. at 30%	0.080	mm	
0.425 - 0.075 mm	71.5	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	9.8	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	17.5	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	100.0	%					
75um Sieve Passing	27.3	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **03.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

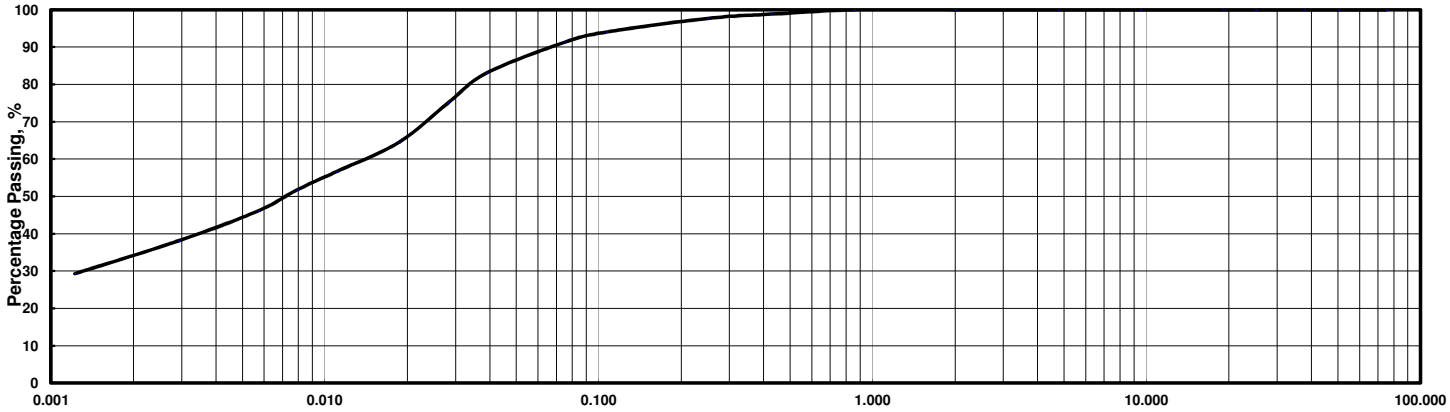
Sample No. : **LD2-12-1b HP-1T** Depth : **6.00-6.60m** ( ) Specific Gravity : 2.73

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.8	97.7	94.0	91.3
Hydro.	Dia., mm	0.039	0.028	0.019	0.011	0.0079	0.0057	0.0029	0.0012							
	% Passing	83.0	75.2	64.5	56.6	51.8	46.1	38.1	29.3							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-12-1b HP-1T 6.00-6.60m			Sample No. Depth	LD2-12-1b HP-1T 6.00-6.60m		
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.014	mm	
2.00 - 0.425 mm	1.2	%		Dia. at 30%	0.0013	mm	
0.425 - 0.075 mm	7.5	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	47.2	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	44.1	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	100.0	%					
75um Sieve Passing	91.3	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **03.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

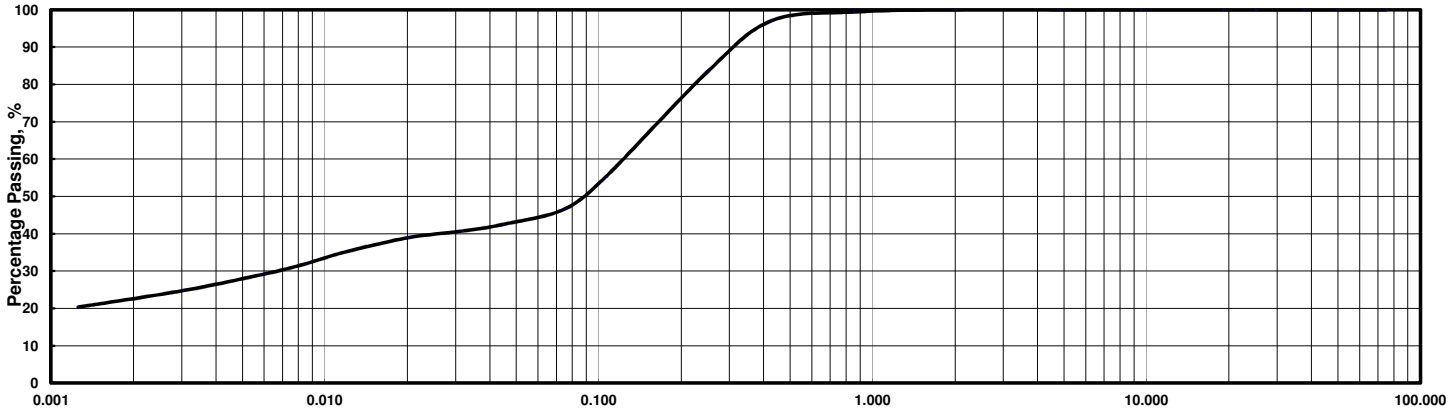
Sample No. : **LD2-12-1b HP-1B** Depth : **6.60-6.80m** ( ) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	97.0	83.4	55.2	46.6
Hydro.	Dia., mm	0.044	0.032	0.020	0.012	0.0084	0.0060	0.0030	0.0013							
	% Passing	42.5	40.7	38.9	35.0	31.8	29.2	24.8	20.3							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-12-1b HP-1B 6.60-6.80m			Sample No. Depth	LD2-12-1b HP-1B 6.60-6.80m		
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.12	mm	
2.00 - 0.425 mm	3.0	%		Dia. at 30%	0.0066	mm	
0.425 - 0.075 mm	50.4	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	18.9	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	27.7	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.4	%					
75um Sieve Passing	46.6	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **03.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

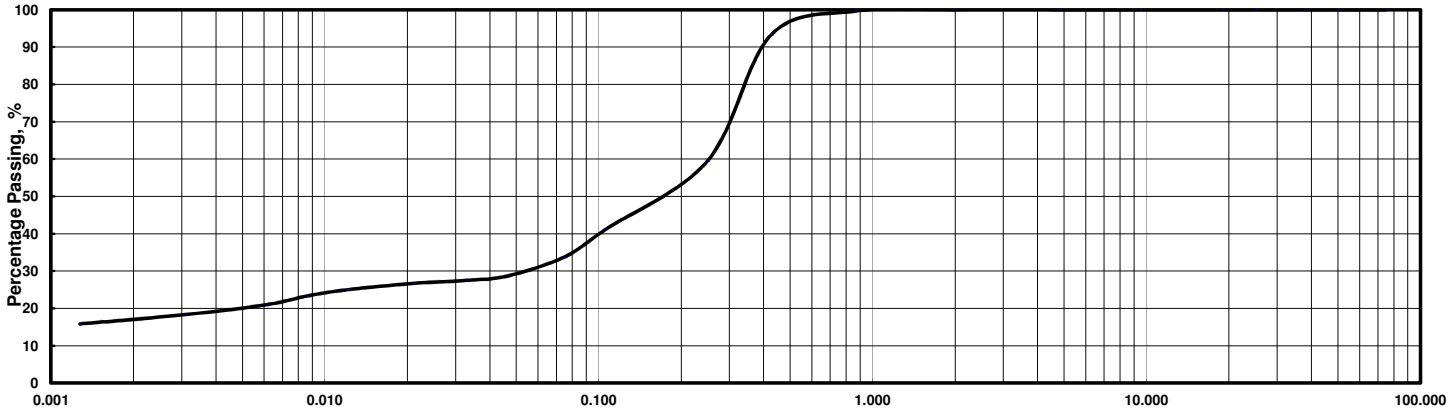
Sample No. : **LD2-12-1b D-2** Depth : **9.00-9.65m** ( ) Specific Gravity : 2.69

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	93.2	59.6	41.2	33.8
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	28.7	27.5	26.7	25.0	23.3	21.0	18.3	15.8							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-12-1b D-2 9.00-9.65m			Sample No. Depth	LD2-12-1b D-2 9.00-9.65m		
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.25	mm	
2.00 - 0.425 mm	6.8	%		Dia. at 30%	0.053	mm	
0.425 - 0.075 mm	59.4	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	13.8	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	20.0	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.6	%					
75um Sieve Passing	33.8	%					

Kiso-Jiban Consultants Co., Ltd.
333

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **03.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

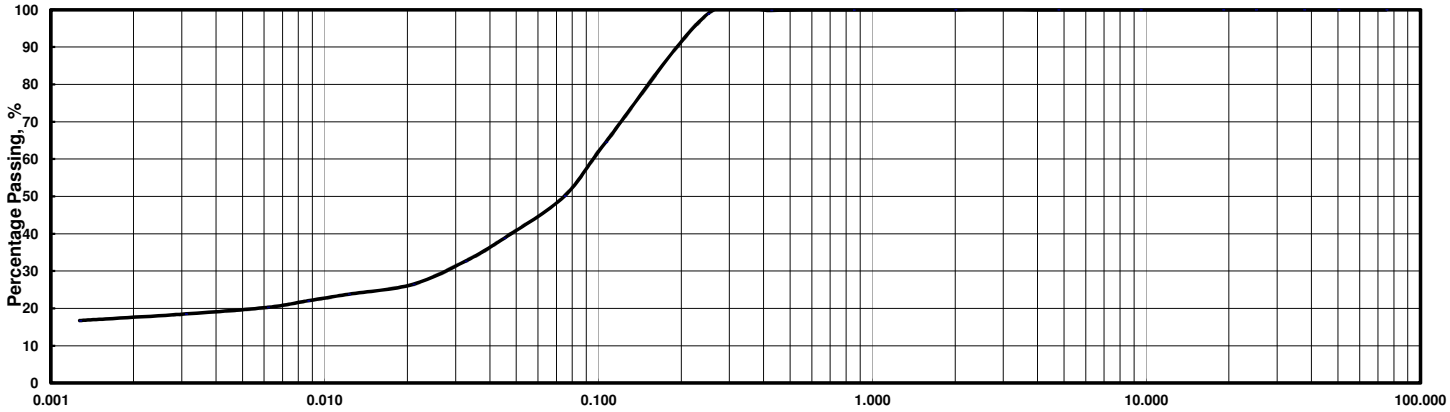
Sample No. : **LD2-12-1b D-3** Depth : **12.00-12.65m** ( ) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.8	98.9	64.5	50.1
Hydro.	Dia., mm	0.045	0.033	0.021	0.012	0.0087	0.0062	0.0031	0.0013							
	% Passing	38.8	32.6	26.4	23.8	22.0	20.3	18.5	16.7							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-12-1b D-3 12.00-12.65m		Sample No. Depth	LD2-12-1b D-3 12.00-12.65m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.095 mm	
2.00 - 0.425 mm	0.2 %		Dia. at 30%	0.027 mm	
0.425 - 0.075 mm	49.7 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	30.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	19.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.9 %				
75um Sieve Passing	50.1 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **03.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

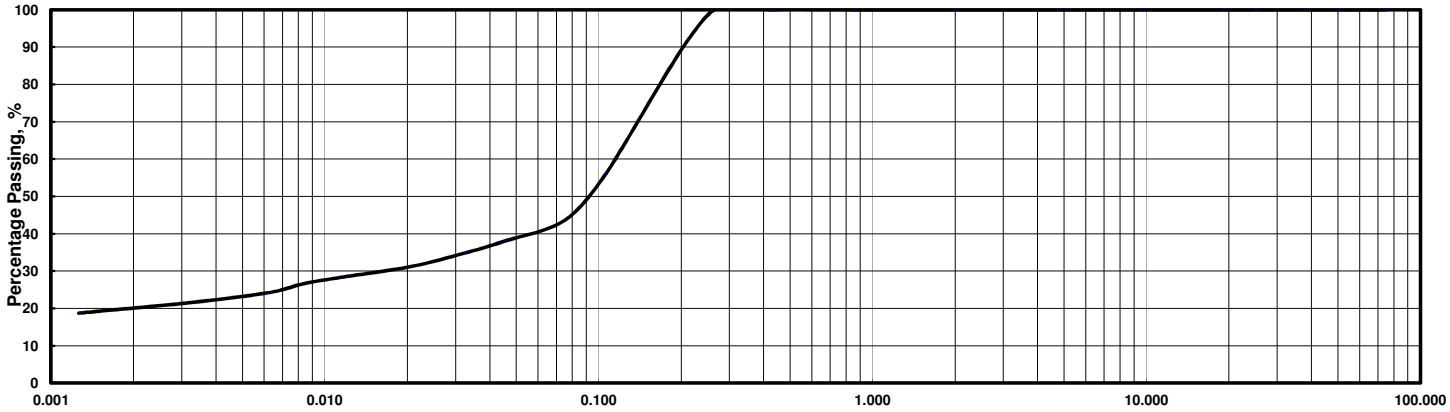
Sample No. : **LD2-12-1b D-4** Depth : **15.00-15.90m** ( ) Specific Gravity : 2.70

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.6	56.0	43.6
Hydro.	Dia., mm	0.045	0.032	0.021	0.012	0.0085	0.0061	0.0031	0.0013							
	% Passing	38.0	34.8	31.2	28.5	26.8	24.1	21.4	18.7							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-12-1b D-4 15.00-15.90m		Sample No. Depth	LD2-12-1b D-4 15.00-15.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.11 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.016 mm	
0.425 - 0.075 mm	56.4 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	20.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	23.1 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	43.6 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **03.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

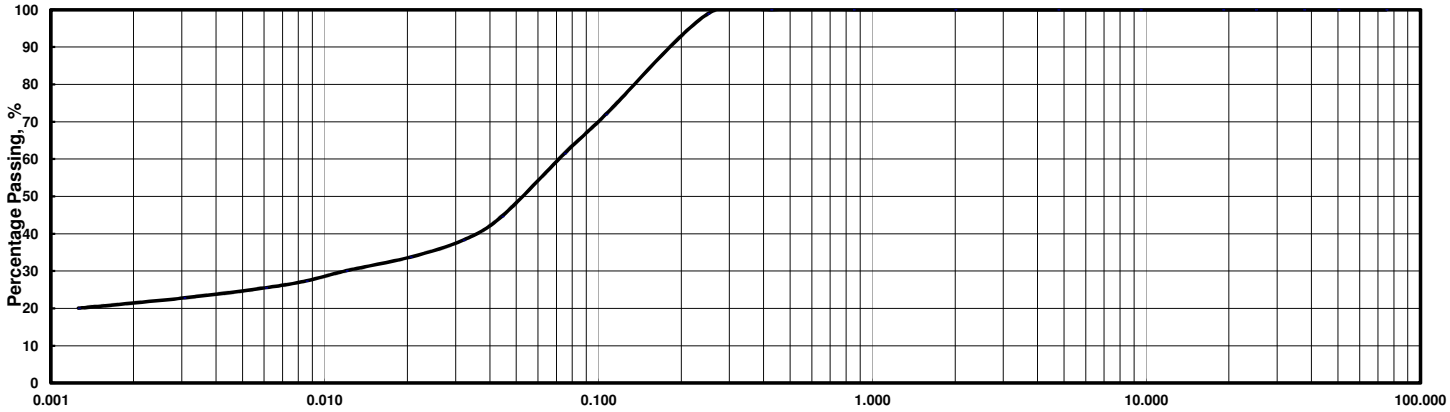
Sample No. : **LD2-12-1b D-5** Depth : **18.00-18.90m** ( ) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.9	71.9	61.5
Hydro.	Dia., mm	0.044	0.032	0.021	0.012	0.0085	0.0061	0.0031	0.0013							
	% Passing	44.7	38.3	33.7	30.1	27.4	25.5	22.8	20.1							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-12-1b D-5 18.00-18.90m		Sample No. Depth	LD2-12-1b D-5 18.00-18.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.072 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.012 mm	
0.425 - 0.075 mm	38.5 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	37.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	24.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	61.5 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **03.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

Sample No. : **LD2-12-1b D-6** Depth : **22.00-22.90m** ( ) Specific Gravity : 2.73

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97.1	87.6	78.8	74.3
Hydro.	Dia., mm	0.041	0.029	0.019	0.011	0.0082	0.0058	0.0030	0.0012							
	% Passing	64.6	59.6	52.5	43.6	39.1	35.6	29.3	24.0							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves

Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

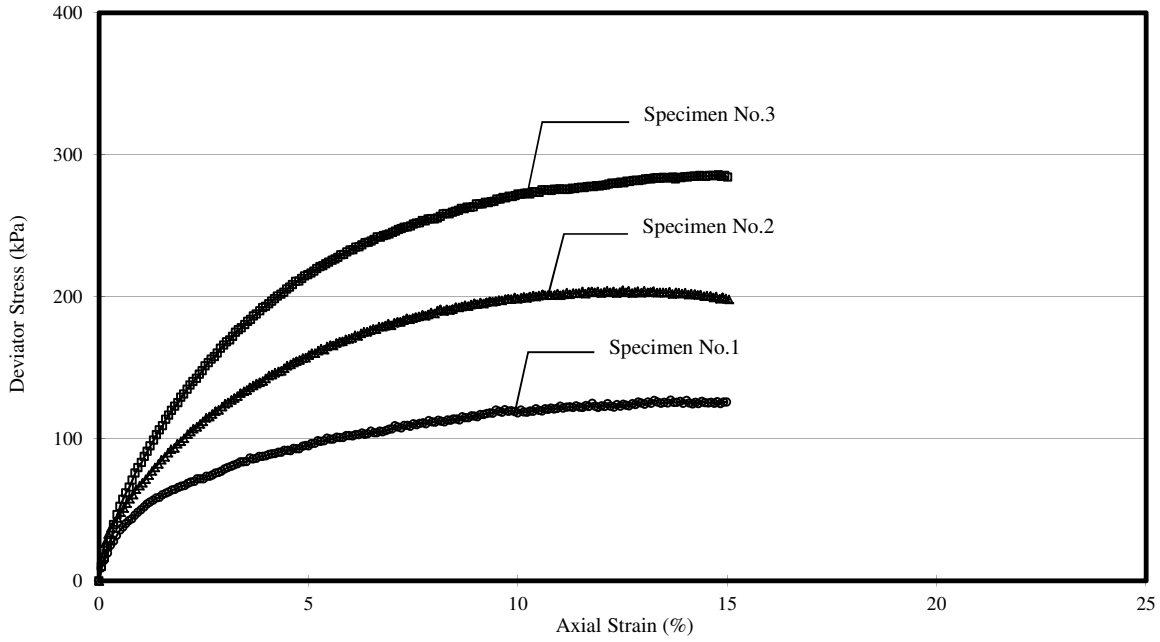
Sample No. Depth	LD2-12-1b D-6 22.00-22.90m		Sample No. Depth	LD2-12-1b D-6 22.00-22.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.030 mm	
2.00 - 0.425 mm	2.9 %		Dia. at 30%	0.0032 mm	
0.425 - 0.075 mm	22.8 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	40.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	33.8 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	74.3 %				

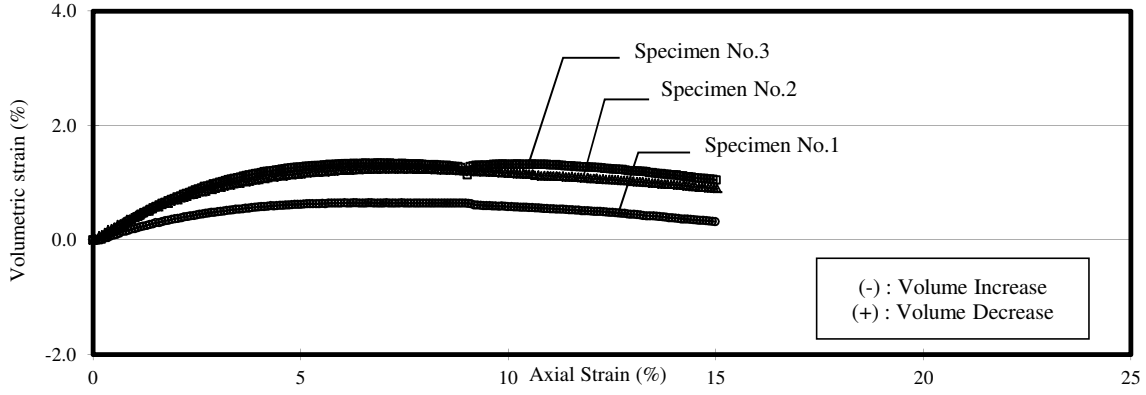
Summary of Consolidated Drained Triaxial Compression Test

Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 11.12.14		Tested by : Perera		Checked by : A. B. Tan			
Borehole No.: LD2-12-1b		Sample No.:D-2		Depth :9.00-9.65m			
Specimen Condition : Undisturbed		Test Method : ASTM D7181-11					
Soil Description : Clayey Sand		Ave. Diameter : 50.0mm		Ave. Height : 100.0mm			
Specimen No.			1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.67	1.67	1.67		
Saturation Stage	Saturated PWP,	kPa	200	200	200		
	Final Cell Pressure,	kPa	240	270	300		
	B-value		0.97	0.98	0.96		
Consolidation Stage	Cell Pressure	kPa	240	270	300		
	Back Pressure	kPa	200	200	200		
	Initial PWP,	kPa	227	254	283		
	Final PWP	kPa	200	200	200		
Consolidation Parameter	Volume Change,	%	0.14	1.49	0.72		
	Coefficient of Consolidation Cv,	m^2/year	45.20	52.27	51.42		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.03	0.21	0.07		
Compression Stage	Cell Pressure	kPa	240	270	300		
	Back Pressure	kPa	200	200	200		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	127	205	286		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	0.41	1.06	1.06		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	13.65	12.50	14.79		
Shear Strength Parameters	In terms of Effective Stress $\phi' = 36$ deg $c' = 0$ kPa		Mode of Failure 1 2 3 4				
Remarks : Specimens are prepared at 90% of Maximum dry density (from compaction Test) = 1.67Mg/m^3							

Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-2 Soil Type: Clayey Sand
Borehole No.: LD2-12-1b Depth : 9.00-9.65m



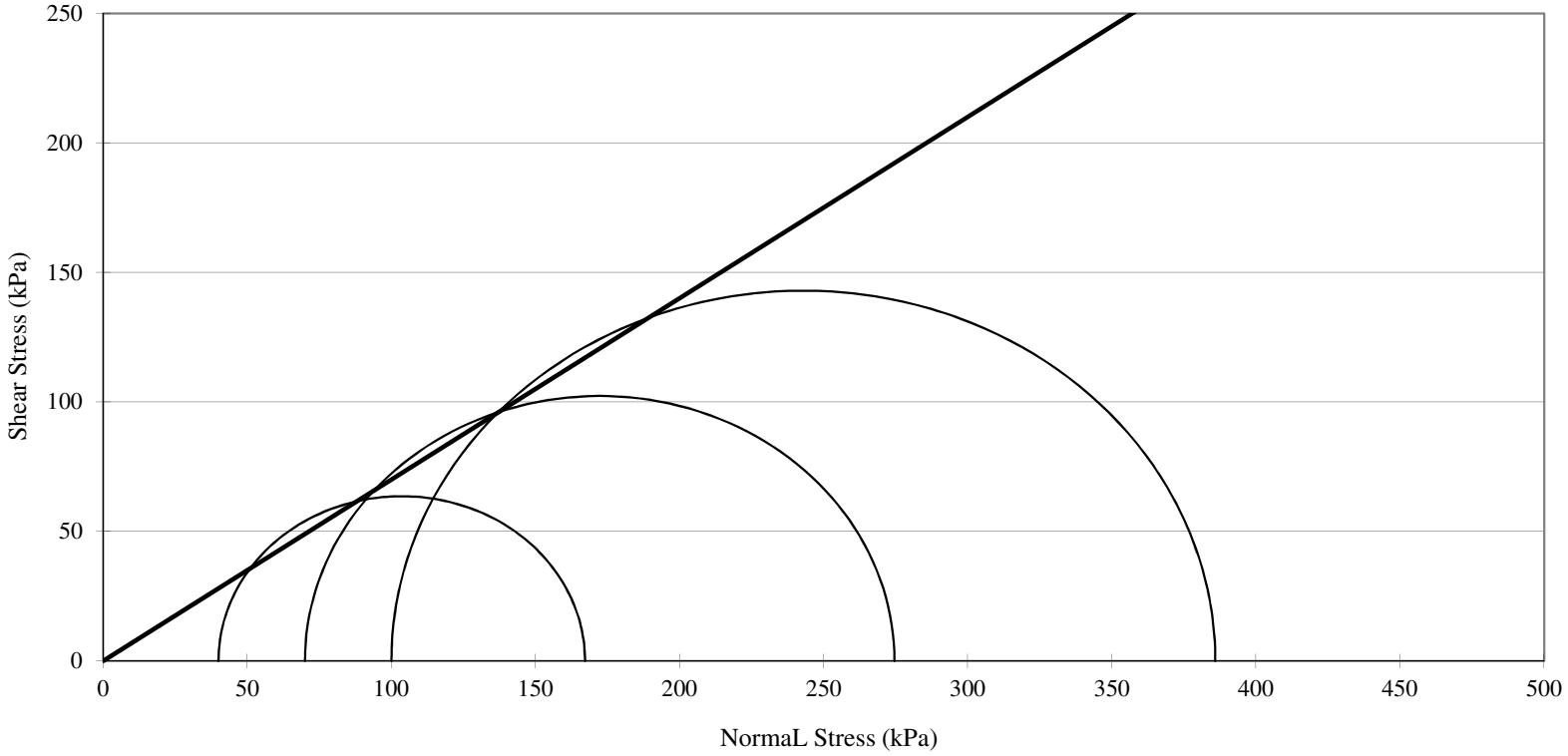


Consolidated Drained Triaxial Compression Test

- Mohr' s Circle (In terms of Total Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14

Borehole No. : LD2-12-1b Soil Type: Clayey Sand
Sample No. : D-2 Depth : 9.00-9.65m
Angle of Internal Friction, ϕ 35 deg
Cohesion, c 0 kPa

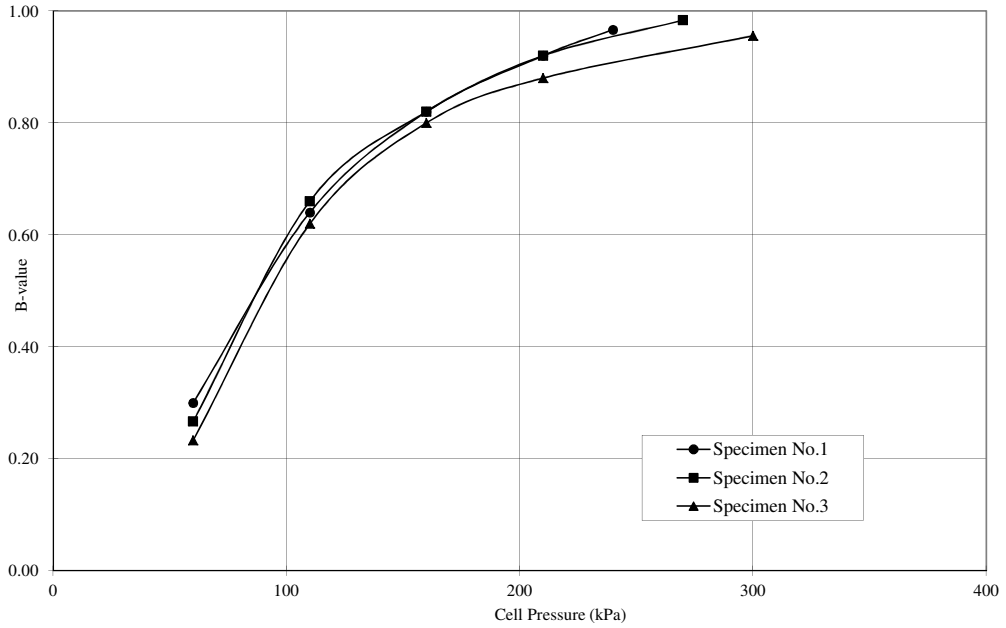


Kiso-Jiban Consultants Co., Ltd.

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

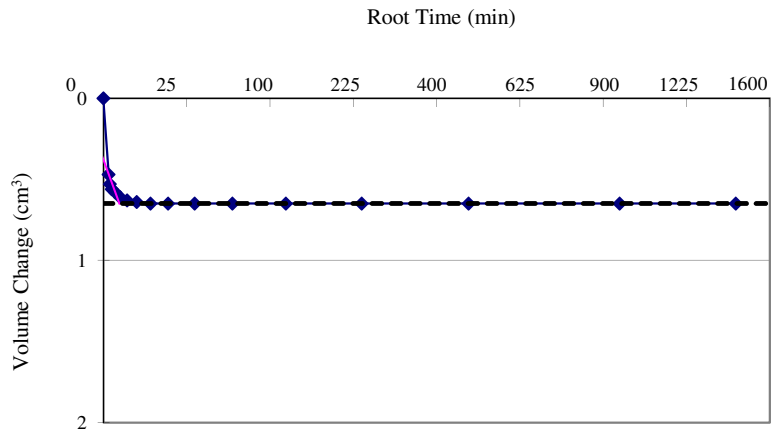
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: LD2-12-1b
Depth : 9.00-9.65m
Sample No.: D-2
Soil Type: Clayey Sand

		Result of B-value Check					
		Specimen 1		Specimen 2		Specimen 3	
		Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60
	P.W.P (kPa)	20	29	20	28	20	27
	Back Pressure (kPa)	20		20		20	
	B-value	0.30		0.27		0.23	
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110
	P.W.P (kPa)	50	82	50	83	50	81
	Back Pressure (kPa)	50		50		50	
	B-value	0.64		0.66		0.62	
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160
	P.W.P (kPa)	100	141	100	141	100	140
	Back Pressure (kPa)	100		100		100	
	B-value	0.82		0.82		0.80	
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210
	P.W.P (kPa)	150	196	150	196	150	194
	Back Pressure (kPa)	150		150		150	
	B-value	0.92		0.92		0.88	
B-check Step.5	Cell Pressure (kPa)	210	240	210	270	210	300
	P.W.P (kPa)	200	229	200	259	200	286
	Back Pressure (kPa)	200		200		200	
	B-value	0.97		0.98		0.96	



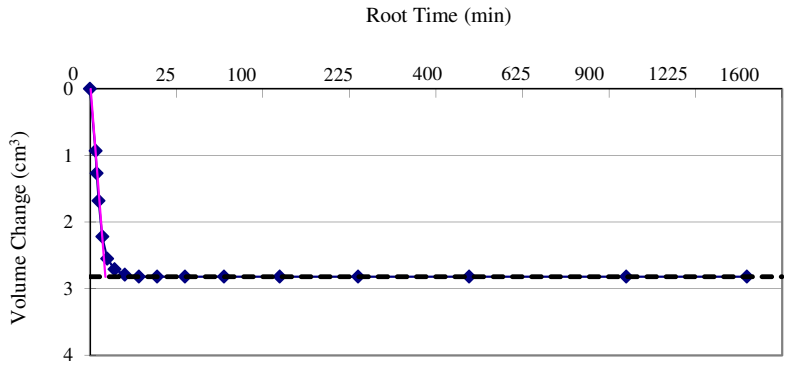
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-2 Soil Type: Clayey Sand
Borehole No.: LD2-12-1b Depth : 9.00-9.65m



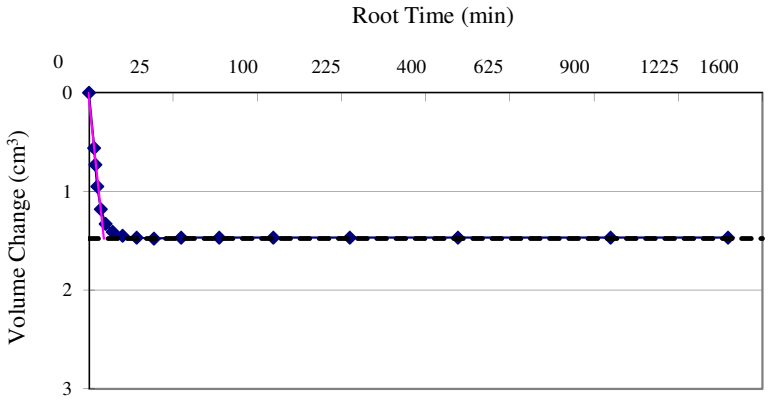
Specimen No.: 1

p' =	40	kPa
t100 =	0.9	min
Cv =	45.20	m^2/year
mvi=	0.03	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	0.8	min
Cv =	52.27	m^2/year
mvi=	0.21	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	0.8	min
Cv =	51.42	m^2/year
mvi=	0.07	m^2/MN

RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

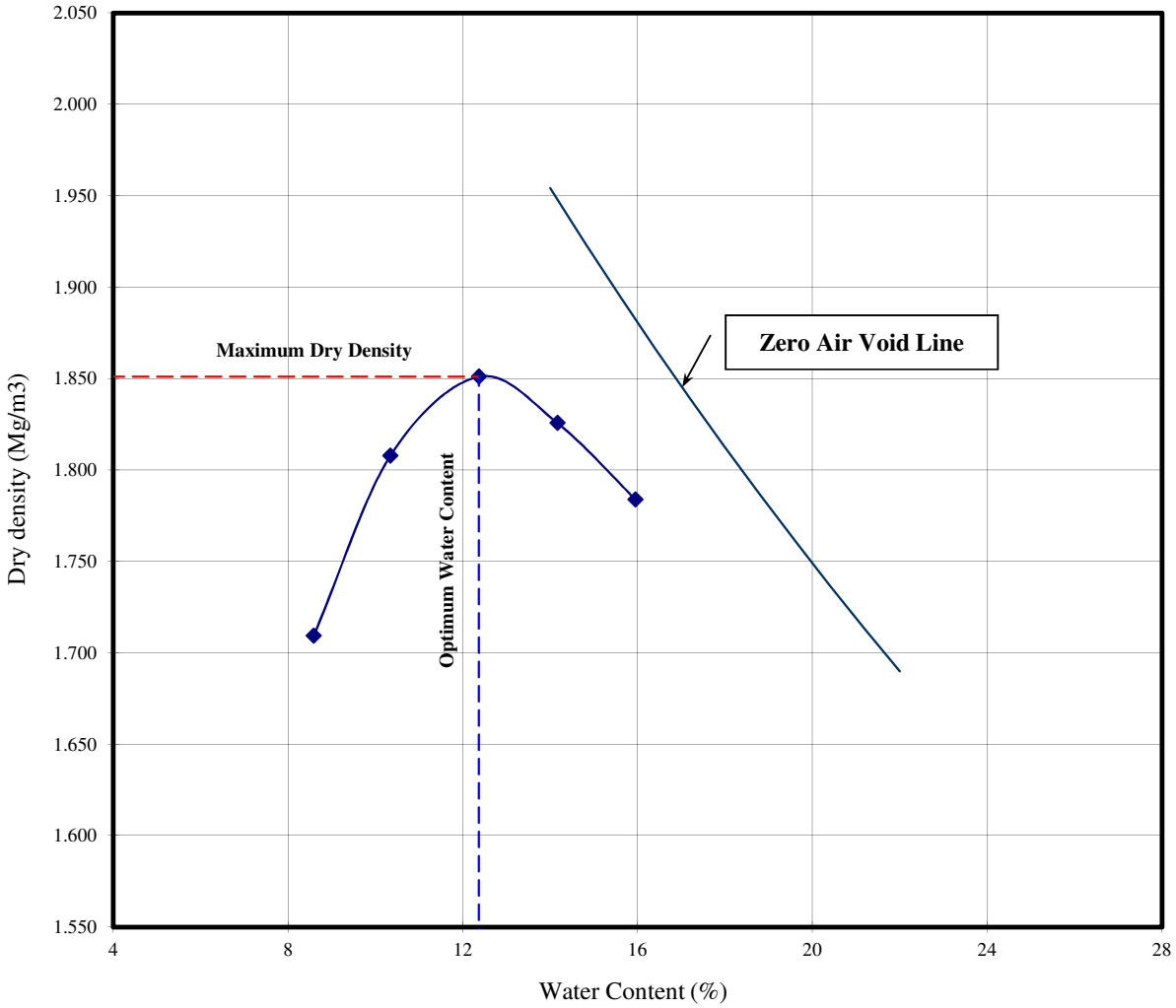
Sampling Date : - **Date of Testing :** 8-Dec-14 **Tested by :** Perera/Bala

Sample No. : LD2-12-1b D-2(9.00-9.65m) **Ref. No.** -

Soil Type :	Clayey Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.69	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	8.6	10.3	12.4	14.2	16.0			
Wet Density (Mg/m3)	1.856	1.995	2.080	2.084	2.068			
Dry Density (Mg/m3)	1.709	1.808	1.851	1.826	1.784			

Maximum Dry Density	**1.851 Mg/m3**
Optimum Water Content	**12.4 %**



343

23) LD2-13-1

TABLE SUMMARY OF SOIL TEST

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project** Standard: **ASTM**

Borehole No.		LD2-13-1								
Sample No.		HP-1	HP-2	D-1	D-2	HP-3	D-3			
Sample Depth		2.00m ~2.80m	5.00m ~5.80m	8.00m ~8.85m	11.00m ~11.80m	14.00m ~14.70m	17.00m ~17.85m			
Condition of Sample		Undisturbed		Disturbed		Undisturbed	Disturbed			
Natural Water Content	%	51.3	30.8	30.3	25.4	27.0	28.6			
Specific Gravity		2.75	2.71	2.71	2.71	2.71	2.71			
Wet Density	Mg/m^3	1.74	1.86	-	1.97	1.87	1.949			
Dry Density	Mg/m^3	1.15	1.42	-	1.57	1.47	1.52			
Natural Void Ratio		1.40	0.91	-	0.73	0.84	0.79			
Degree of Saturation	%	100	92	-	94	87	98			
Atterberg Limits	Liquid Limit, %	54	- *3	28	24	- *3	- *3			
	Plastic Limit, %	27	- *3	16	17	- *3	- *3			
	Plasticity Index, %	27	- *3	12	7	- *3	- *3			
Grain Size Analysis	Gravel, %	0	0	0	0	0	0			
	Sand, %	1	59	37	49	41	52			
	Silt, %	42	15	33	25	37	23			
	Clay & Colloid, %	57	26	30	26	22	25			
	Max. diameter, mm	0.106	0.850	2.00	4.75	2.00	2.00			
	Diam. at 60% mm	0.0057	0.13	0.063	0.11	0.077	0.10			
	Diam. at 10% mm	-	-	-	-	-	-			
Visual soil description		Clay	Clayey Sand	Sandy Clay	Sandy Clay	Sandy Clay	Clayey Sand			
Unified soil classification		CL	-	CL	CL	-	-			
Triaxial compression test	Angle of Internal Friction (^{0})	-	-	-	-	-	-			
	Cohesion Intercept, kPa	-	-	-	-	-	-			
	Condition of drainage	-	-	-	-	-	-			
	Angle of Internal Friction *2 (^{0})	-	-	-	39	-	-			
	Cohesion Intercept, kPa *2	-	-	-	0	-	-			
	Condition of drainage	-	-	-	CD*4	-	-			
Consolidation Test	Preconsolidation Pressure, kPa	-	-	-	-	-	-			
	Compression Index(Average)	-	-	-	-	-	-			
	Pressure Range for Compression Index(kPa)	-	-	-	-	-	-			
	Swell index	-	-	-	-	-	-			
Compaction Test *4	Maximum Dry Density, Mg/m^3	-	-	-	1.63	-	-			
	Optimum Moisture Content , %	-	-	-	16.8	-	-			
Unconfined Compression Strength (kPa)		-	-	-	-	-	-			
Strain at failure (%)		-	-	-	-	-	-			

Remarks : Atterberg Limits was tested on material at natural state except those with *1 which was tested on material passing through 0.425mm test sieve.

*2 : In terms of effective stress *3 : Unable to test because sample contains lot of sand

*4 : Specimens are prepared at 90% of Maximum dry density Checked by : A. B. Tan

Kiso-Jiban Consultants Co., Ltd.

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No. : S27-14

Standard : ASTM D4318-10

Date of Testing : 03.12.14

Tested By : Vasantha

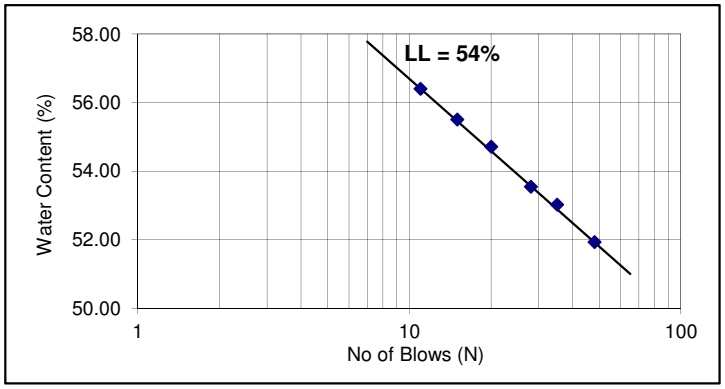
Checked By : A. B. Tan

Sample No. : LD2-13-1 HP-1

Depth : 2.00-2.80m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	48	51.93
2	35	53.02
3	28	53.54
4	20	54.71
5	15	55.50
6	11	56.40
Liquid Limits %		**54**
Plastic Limits %		**27**
Plasticity Index		**27**

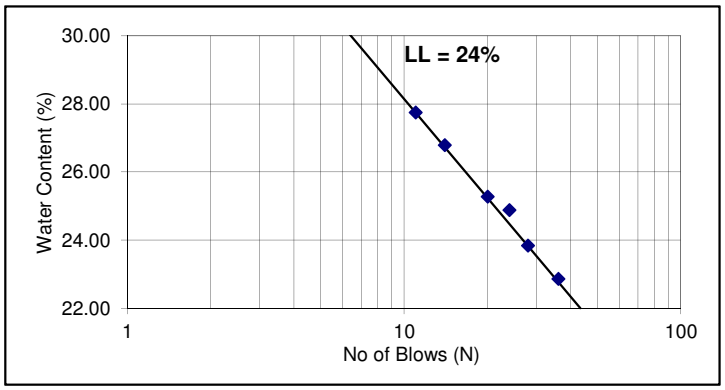


Sample No. : LD2-13-1 D-2

Depth : 11.00-11.80m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	36	22.86
2	28	23.83
3	24	24.88
4	20	25.27
5	14	26.79
6	11	27.75
Liquid Limits %		**24**
Plastic Limits %		**17**
Plasticity Index		**7**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project

Project No. : S27-14

Standard : ASTM D4318-10

Date of Testing : 11.12.14

Tested By : Vasantha

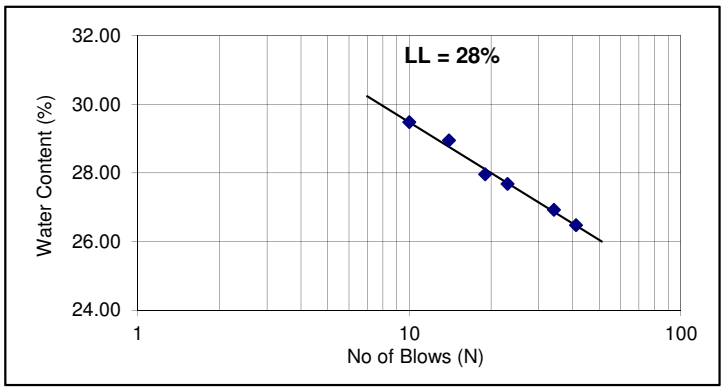
Checked By : A. B. Tan

Sample No. : LD2-13-1 D-1

Depth : 8.00-8.85m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	41	26.47
2	34	26.92
3	23	27.68
4	19	27.96
5	14	28.94
6	10	29.47
Liquid Limits %		**28**
Plastic Limits %		**16**
Plasticity Index		**12**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

348

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **29.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

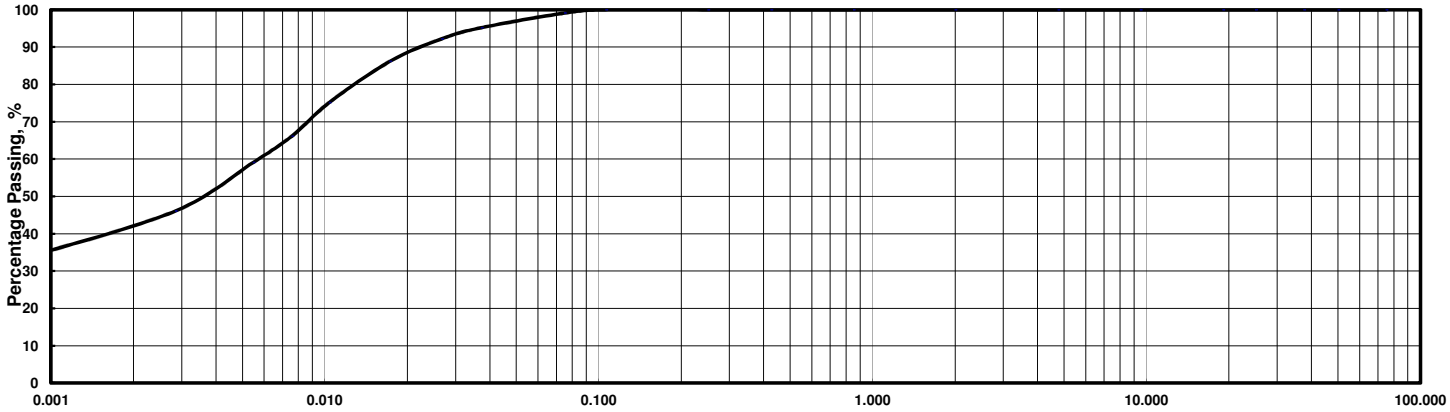
Sample No. : **LD2-13-1 HP-1** Depth : **2.00-2.80m** ( ) Specific Gravity : 2.75

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1
Hydro.	Dia., mm	0.037	0.027	0.017	0.010	0.0076	0.0055	0.0028	0.0009							
	% Passing	95.2	92.2	86.2	75.1	66.1	59.1	46.1	34.1							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-13-1 HP-1 2.00-2.80m			Sample No. Depth	LD2-13-1 HP-1 2.00-2.80m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.106	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.0057	mm
2.00 - 0.425 mm	0.0	%		Dia. at 30%	-	mm
0.425 - 0.075 mm	0.9	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	42.3	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	56.8	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	99.1	%				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **26.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

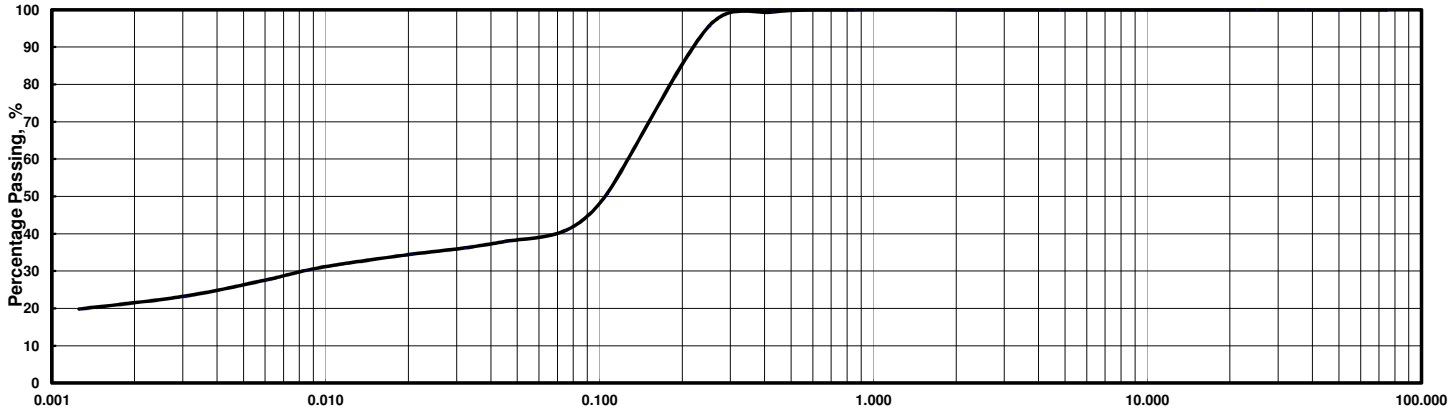
Sample No. : **LD2-13-1 HP-2** Depth : **5.00-5.80m** ( ) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	95.5	50.6	40.9
Hydro.	Dia., mm	0.045	0.032	0.020	0.012	0.0084	0.0060	0.0030	0.0013							
	% Passing	37.9	36.2	34.5	32.0	30.2	27.6	23.3	19.8							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-13-1 HP-2 5.00-5.80m		Sample No. Depth	LD2-13-1 HP-2 5.00-5.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.13 mm	
2.00 - 0.425 mm	0.6 %		Dia. at 30%	0.0083 mm	
0.425 - 0.075 mm	58.5 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	14.8 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	26.1 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	40.9 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **09.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

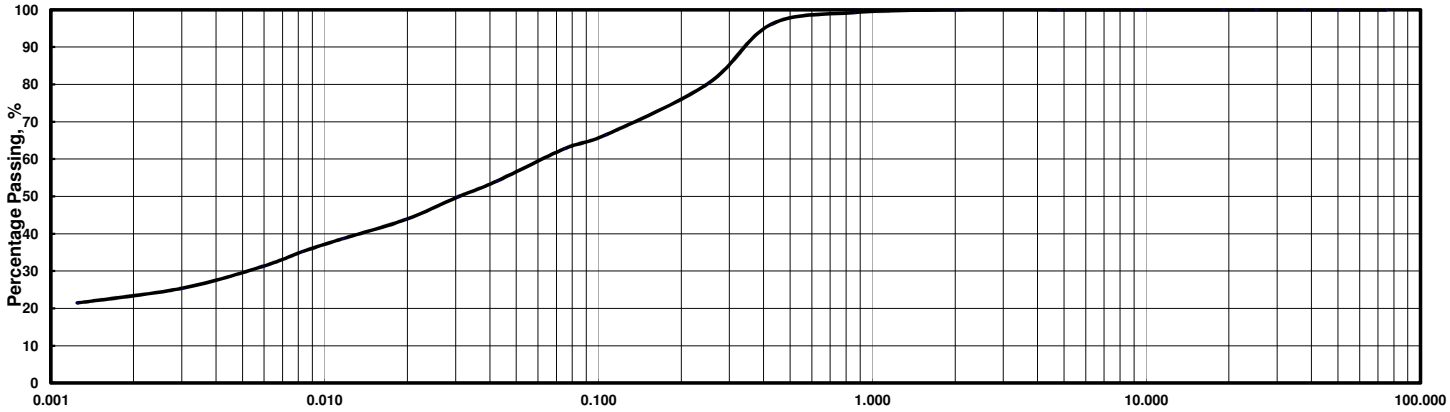
Sample No. : **LD2-13-1 D-1** Depth : **8.00-8.85m** ( ) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	96.1	80.2	66.5	62.8
Hydro.	Dia., mm	0.042	0.030	0.020	0.012	0.0083	0.0059	0.0030	0.0012							
	% Passing	54.1	49.8	43.8	38.6	35.2	31.2	25.4	21.5							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-13-1 D-1 8.00-8.85m			Sample No. Depth	LD2-13-1 D-1 8.00-8.85m		
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.063	mm	
2.00 - 0.425 mm	3.9	%		Dia. at 30%	0.0051	mm	
0.425 - 0.075 mm	33.3	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	33.4	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	29.4	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.2	%					
75um Sieve Passing	62.8	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **26.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

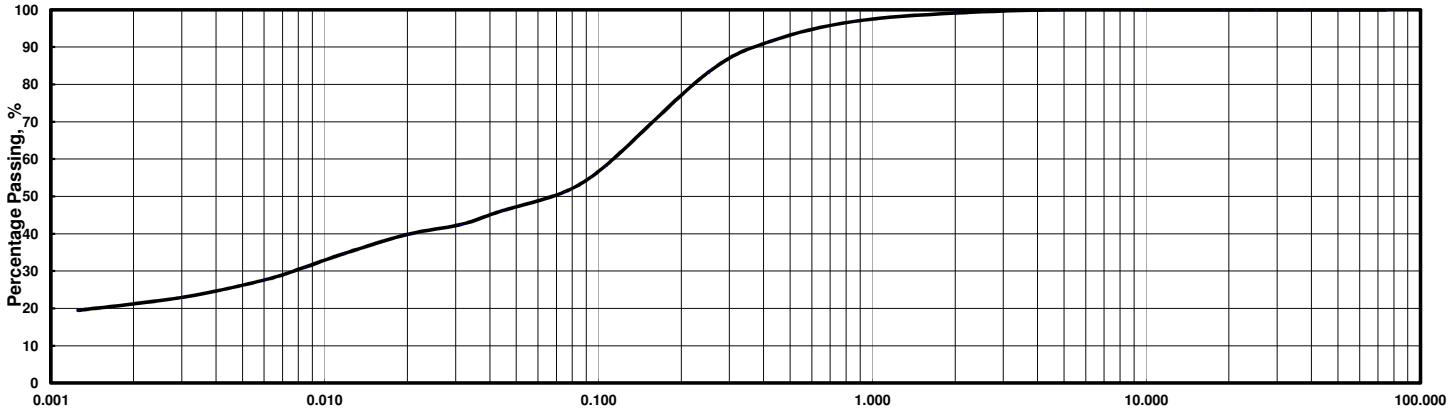
Sample No. : **LD2-13-1 D-2** Depth : **11.00-11.80m** ( ) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1	96.8	91.6	83.1	58.3	51.2
Hydro.	Dia., mm	0.044	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0013							
	% Passing	46.0	42.5	39.8	34.7	31.0	27.6	23.0	19.5							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-13-1 D-2 11.00-11.80m			Sample No. Depth	LD2-13-1 D-2 11.00-11.80m		
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm	
4.75 - 2.00 mm	0.9	%		Dia. at 60%	0.11	mm	
2.00 - 0.425 mm	7.5	%		Dia. at 30%	0.0076	mm	
0.425 - 0.075 mm	40.4	%		Dia. at 10%	-	mm	
0.075 - 0.005 mm	25.2	%		Coeff. of Uniformity	-		
Smaller than 0.005 mm	26.0	%		Coeff. of Curvature	-		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	96.8	%					
75um Sieve Passing	51.2	%					

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **26.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

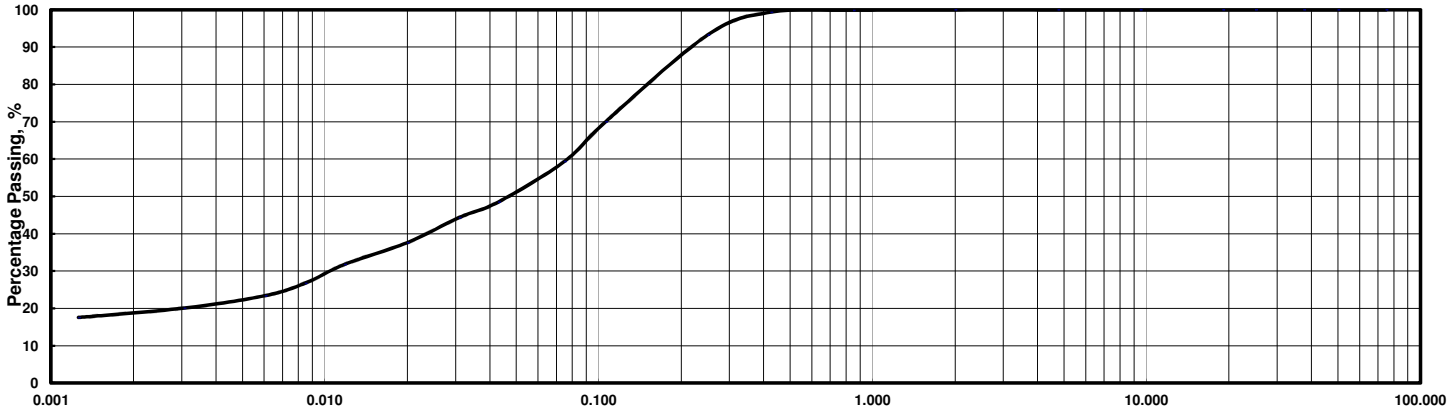
Sample No. : **LD2-13-1 HP-3** Depth : **14.00-14.70m** ( ) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.3	93.3	70.0	59.4
Hydro.	Dia., mm	0.043	0.031	0.020	0.012	0.0085	0.0061	0.0031	0.0013							
	% Passing	48.5	44.3	37.6	31.8	26.8	23.4	20.1	17.6							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



Grain Diameter, mm

0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-13-1 HP-3 14.00-14.70m		Sample No. Depth	LD2-13-1 HP-3 14.00-14.70m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.000 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.077 mm	
2.00 - 0.425 mm	0.7 %		Dia. at 30%	0.011 mm	
0.425 - 0.075 mm	40.0 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	37.1 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	22.2 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.9 %				
75um Sieve Passing	59.4 %				

GRAIN SIZE DISTRIBUTION

Project : **Preparatory Survey on Matarbari USC Coral-fired Power Project**

Location of Project : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **28.11.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

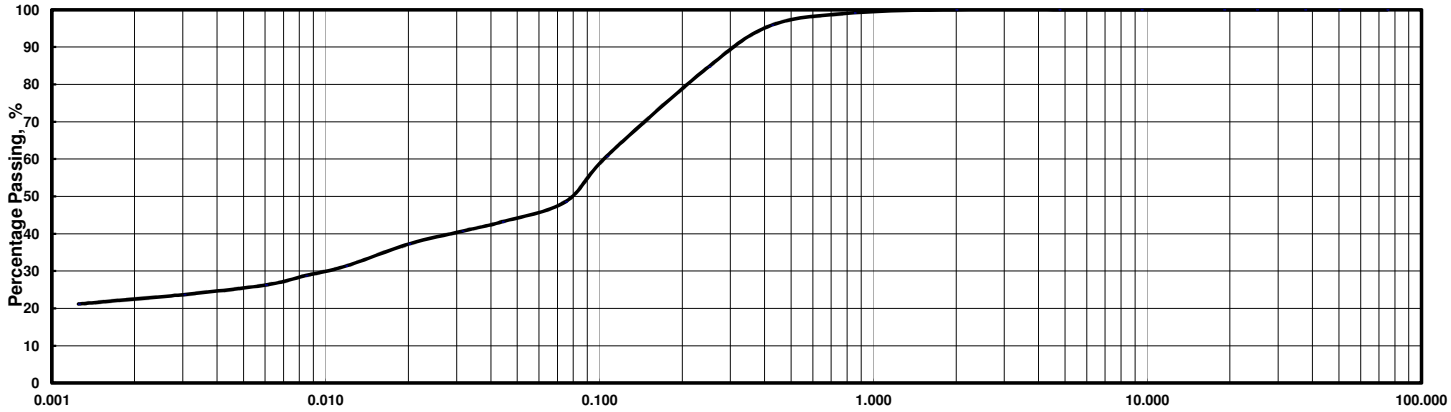
Sample No. : **LD2-13-1 D-3** Depth : **17.00-17.85m** ( ) Specific Gravity : 2.71

Sieve	Dia., mm			75.0	50.0	37.5	25.0	19.0	9.50	4.75	2.00	0.850	0.425	0.250	0.106	0.075
	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	95.9	84.8	60.8	48.6
Hydro.	Dia., mm	0.044	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0012							
	% Passing	43.2	40.7	37.3	31.3	28.8	26.3	23.7	21.2							

Sample No. : Depth : ( ) Specific Gravity :

Sieve	Dia., mm															
	% Passing															
Hydro.	Dia., mm															
	% Passing															

Grain Size Distribution Curves



0.005	0.075	0.425	2.00	4.75	19.0	75.0
CLAY	SILT	FINE / MEDIUM / COARSE	SAND	FINE	COARSE	GRAVEL

Sample No. Depth	LD2-13-1 D-3 17.00-17.85m		Sample No. Depth	LD2-13-1 D-3 17.00-17.85m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.10 mm	
2.00 - 0.425 mm	4.1 %		Dia. at 30%	0.0099 mm	
0.425 - 0.075 mm	47.3 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	23.2 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	25.4 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.2 %				
75um Sieve Passing	48.6 %				

Summary of Consolidated Drained Triaxial Compression Test

Project No.: S27-14	Project :Preparatory Survey on Matarbari USC Coral-fired Power Project		
Date Tested : 12.12.14	Tested by : Perera	Checked by : A. B. Tan	
Borehole No.: LD2-13-1	Sample No.:D-2	Depth : 11.00-11.80m	
Specimen Condition : Remoulded	Test Method : ASTM D7181-11		
Soil Description : Sandy Clay	Ave. Diameter : 50.0mm	Ave. Height : 100.0mm	

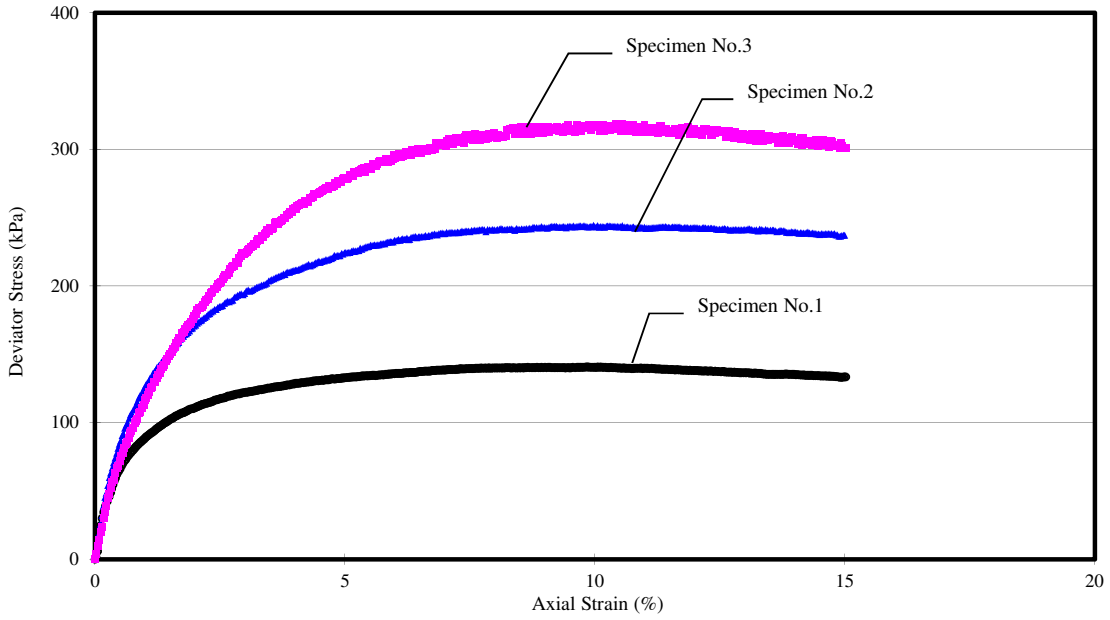
	Specimen No.		1	2	3	4	
Initial Condition	Wet Density,	Mg/m^3	-	-	-		
	Water Content,	%	-	-	-		
	Dry Density	Mg/m^3	1.46	1.46	1.46		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	570	600		
	B-value		0.97	0.96	0.96		
Consolidation Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	529	558	587		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Volume Change,	%	0.24	0.10	0.23		
	Coefficient of Consolidation Cv,	m^2/year	1543	432	345		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.060	0.014	0.023		
Compression Stage	Cell Pressure	kPa	540	570	600		
	Back Pressure	kPa	500	500	500		
	Effective Cell Pressure	kPa	40	70	100		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	141	245	319		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-0.67	-0.30	-0.12		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	9.82	9.97	10.54		
Shear Strength Parameters	ϕ_d = 39 Degree c_d = 0 kPa		Mode of Failure				
			1	2	3	4	

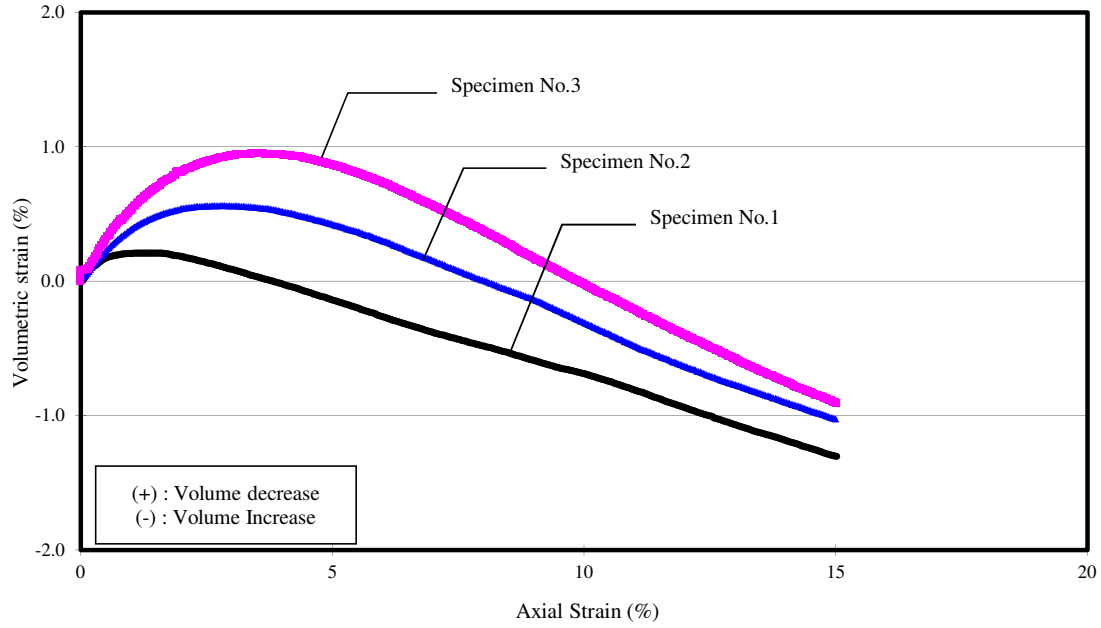
Remarks :

Specimens are prepared at 90% of Maximum dry density (from compaction Test) = 1.46Mg/m^3

Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-2 Soil Type: Sandy Clay
Borehole No.: LD2-13-1 Depth : 11.00-11.80m





Consolidated Drained Triaxial Compression Test
With Pore water Pressure Measurement

- Mohr' s Circle (In terms of Total Stress at Peak Deviator Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

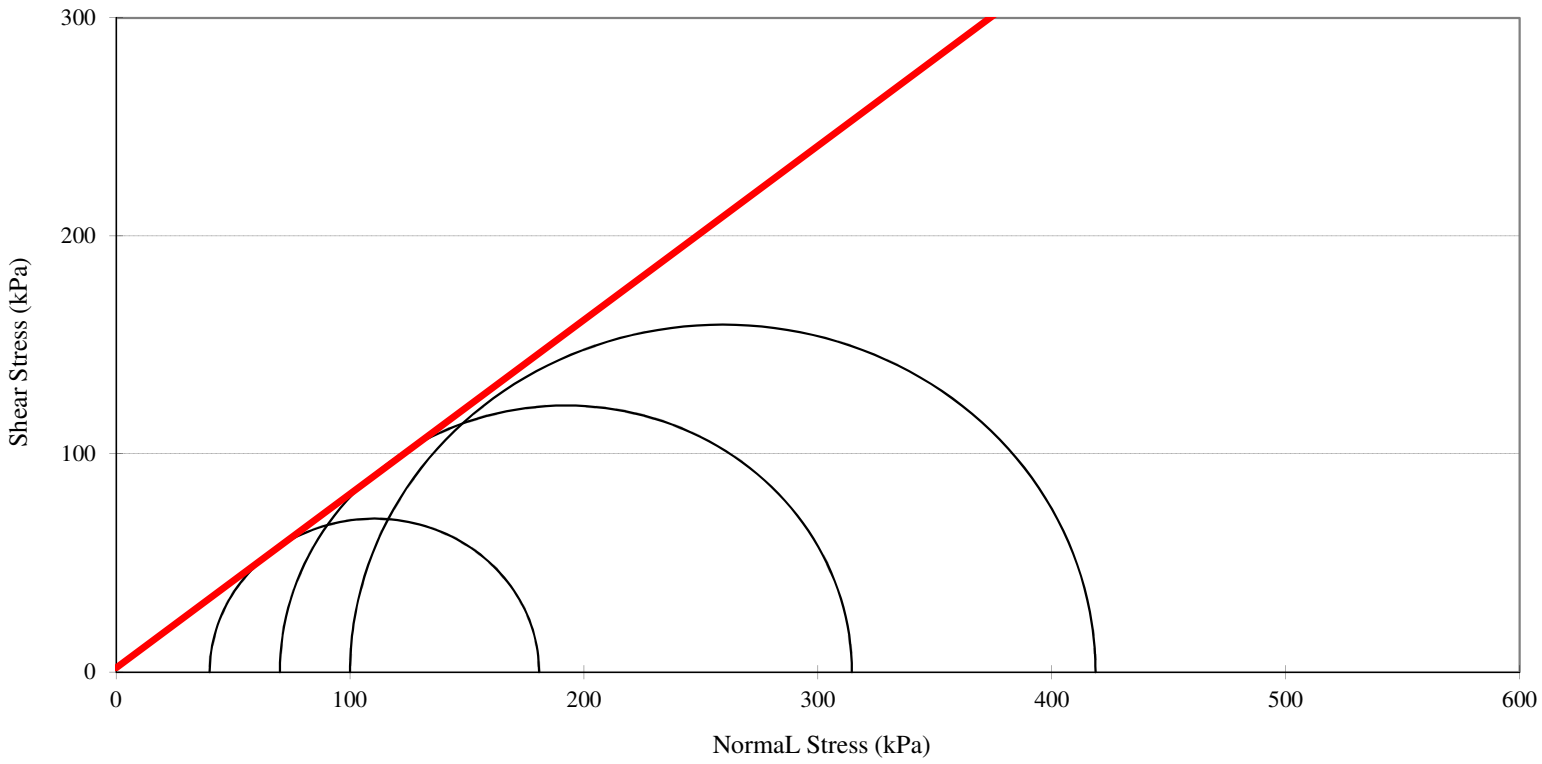
Project No. : S27-14

Borehole No. : LD2-13-1 Soil Type: Sandy Clay

Sample No. : D-2 Depth : 11.00-11.80m

Angle of Internal Friction, ϕ_d 39 deg

Cohesion, c_d 0 kPa



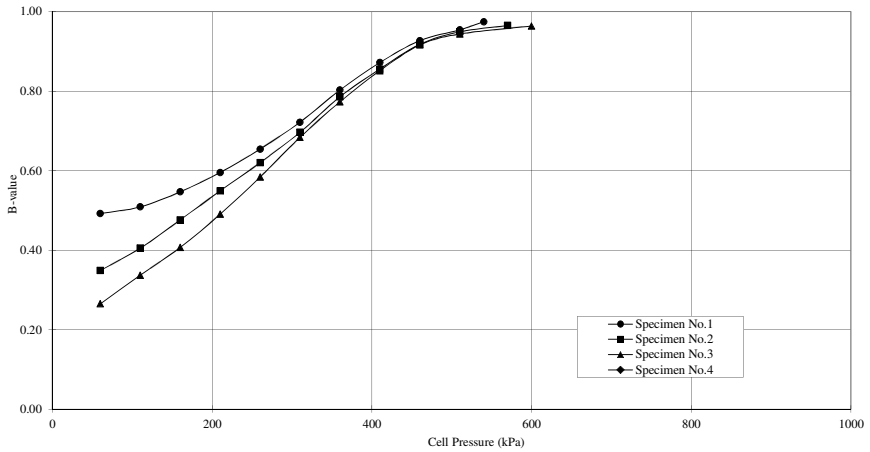
Kiso-Jiban Consultants Co., Ltd.

357

Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

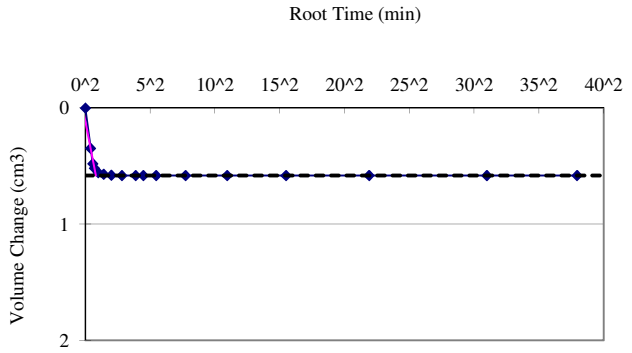
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: LD2-13-1 Depth : 11.00-11.80m
Sample No.: D-2 Soil Type: Sandy Clay

		Result of B-value Check							
		Specimen 1		Specimen 2		Specimen 3		Specimen 4	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-check Step.1	Cell Pressure (kPa)	30	60	30	60	30	60		
	P.W.P (kPa)	20	34.8	20	30.5	20	28.0		
	Back Pressure (kPa)	20		20		20			
	B-value	0.49		0.35		0.27			
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110		
	P.W.P (kPa)	50	75.4	50	70.3	50	66.9		
	Back Pressure (kPa)	50		50		50			
	B-value	0.51		0.41		0.34			
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160		
	P.W.P (kPa)	100	127.3	100	123.8	100	120.3		
	Back Pressure (kPa)	100		100		100			
	B-value	0.55		0.48		0.41			
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210		
	P.W.P (kPa)	150	179.8	150	177.5	150	174.5		
	Back Pressure (kPa)	150		150		150			
	B-value	0.60		0.55		0.49			
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260		
	P.W.P (kPa)	200	232.7	200	231.0	200	229.2		
	Back Pressure (kPa)	200		200		200			
	B-value	0.65		0.62		0.58			
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310		
	P.W.P (kPa)	250	286.1	250	284.8	250	284.2		
	Back Pressure (kPa)	250		250		250			
	B-value	0.72		0.70		0.68			
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360		
	P.W.P (kPa)	300	340.1	300	339.3	300	338.7		
	Back Pressure (kPa)	300		300		300			
	B-value	0.80		0.79		0.77			
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410		
	P.W.P (kPa)	350	393.6	350	392.8	350	392.6		
	Back Pressure (kPa)	350		350		350			
	B-value	0.87		0.86		0.85			
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460		
	P.W.P (kPa)	400	446.3	400	445.9	400	445.8		
	Back Pressure (kPa)	400		400		400			
	B-value	0.93		0.92		0.92			
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510		
	P.W.P (kPa)	450	497.7	450	497.5	450	497.2		
	Back Pressure (kPa)	450		450		450			
	B-value	0.95		0.95		0.94			
B-check Step.11	Cell Pressure (kPa)	510	540	510	570	510	600		
	P.W.P (kPa)	500	529.2	500	557.9	500	586.7		
	Back Pressure (kPa)	500		500		500			
	B-value	0.97		0.96		0.96			



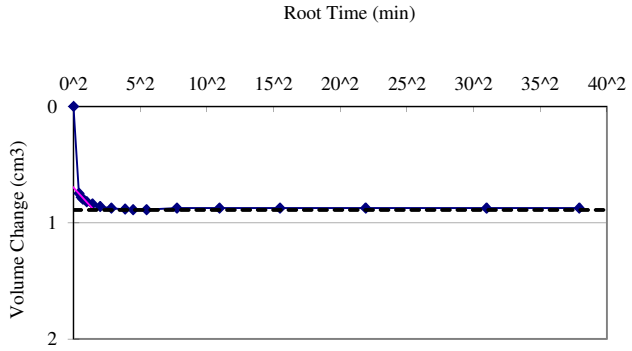
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Borehole No.: LD2-13-1 Soil Type: Sandy Clay
Sample No.: D-2 Depth : 11.00-11.80m



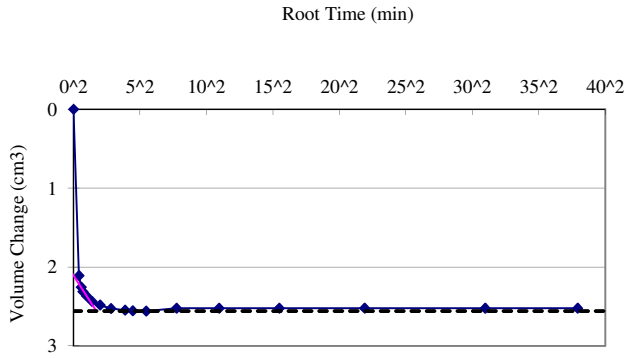
Specimen No.: 1

p' =	40	kPa
t100 =	0.7	min
Cv =	1543	m^2/year
mvi=	0.060	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	2.4	min
Cv =	432	m^2/year
mvi=	0.014	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	3.0	min
Cv =	345	m^2/year
mvi=	0.023	m^2/MN

RESULT OF COMPACTION TEST

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project **Checked by :** A. B. Tan

Project No. : S27-14 **Site Location :** Bangladesh

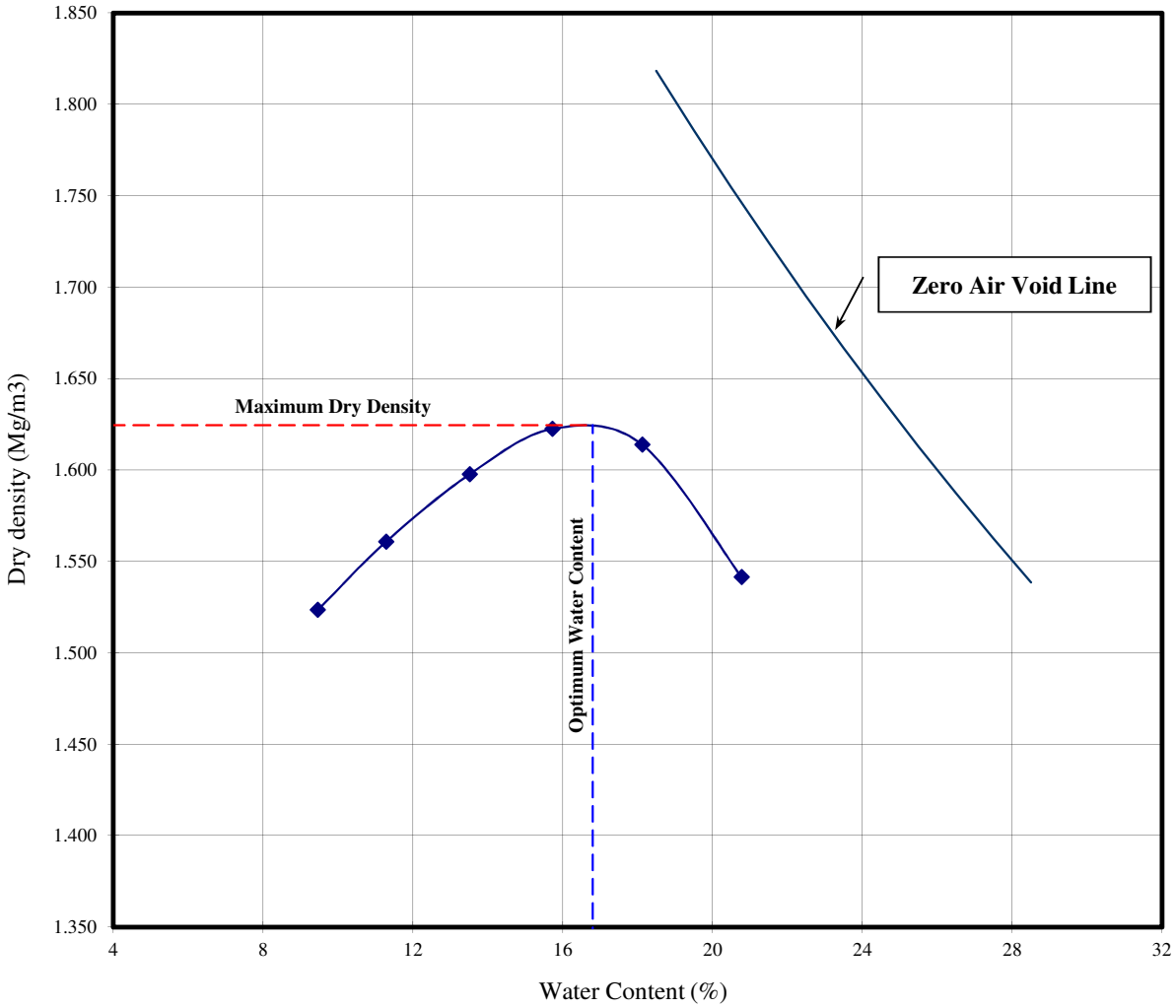
Sampling Date : - **Date of Testing :** 8-Dec-14 **Tested by :** Perera/Bala

Sample No. : LD2-13-1 D-2(11.00-11.80m) **Ref. No.** -

Soil Type :	Silty Sand	**Standared : ASTM D698-07**				**Weight of Rammer :**	2.5 kg
Specific Gravity :	2.74	**Mold**	**Diameter :**	10.11 cm		**Drop Height :**	30.5 cm
Natural Water Content :	N.A.		**Height :**	11.69 cm		**No.of layers :**	3
Water Content after Dried :	N.A.		**Volume :**	938 cm3		**No. of blows / layers :**	25

Specimen No.	1	2	3	4	5	6	7	8
Water Content (%)	9.5	11.3	13.5	15.7	18.1	20.8		
Wet Density (Mg/m3)	1.668	1.737	1.814	1.878	1.906	1.862		
Dry Density (Mg/m3)	1.524	1.561	1.598	1.622	1.614	1.541		

Maximum Dry Density	**1.625 Mg/m3**
Optimum Water Content	**16.8 %**



360