32) PP-21-3

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TABLE SUMMARY OF SOIL TEST

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

Borehole No.			PP-21-3								
Sample No.			HP-1	D-1	HP-2	D-2	D-3				
Sample Depth			1.00m ~1.90m	4.00m ~4.20m	5.00m ~5.90m	7.00m ~7.75m	11.00m ~11.90m				
Condition of Sample			Undisturbed	Disturbed	Undisturbed	Disturbed					
Natural Water Content		%	48.9	31.5	25.5	29.0	24.9				
Specific Gravity			2.74	2.72	2.71	2.70	2.72				
Wet Density		Mg/m^3	1.75	-	1.94	1.92	1.87				
Dry Density		Mg/m^3	1.18	-	1.55	1.49	1.50				
Natural Void Ratio			1.33	-	0.75	0.81	0.81				
Degree of Saturation		%	100	-	92	96	83				
Atterberg Limits	Liquid Limit,	%	59	31	- *3	- *3	- *3				
	Plastic Limit,	%	28	20	- *3	- *3	- *3				
	Plasticity Index,	%	31	11	- *3	- *3	- *3				
Grain Size Analysis	Gravel,	%	0	0	0	0	0				
	Sand,	%	2	22	41	53	71				
	Silt,	%	39	48	32	23	12				
	Clay & Colloid,	%	59	30	27	24	17				
	Max. diameter,	mm	0.850	0.850	0.850	0.850	2.00				
	Diam. at 60%	mm	0.0052	0.037	0.076	0.12	0.15				
	Diam. at 10%	mm	-	-	-	-	-				
Visual soil description			Clay	Clay with Sand	Sandy Clay	Clayey Sand	Clayey Sand				
Unified soil classification			CH	CL	-	-	-				
Triaxial compression test	Angle of Internal Friction	(^{0})	0 *3	-	-	-	-				
	Cohesion Intercept, kPa		35 *3	-	-	-	-				
	Condition of drainage		UU	-	-	-	-				
	Angle of Internal Friction *2	(^{0})	-	-	-	-	-				
	Cohesion Intercept, kPa *2		-	-	-	-	-				
	Condition of drainage		-	-	-	-	-				
Consolidation Test	Preconsolidation Pressure,	kPa	140	-	-	-	-				
	Compression Index(Average)		0.44	-	-	-	-				
	Pressure Range for Compression Index(kPa)		400-3200	-	-	-	-				
	Swell index		0.11	-	-	-	-				
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 : Result based on one specimen

Checked by : A. B. Tan

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ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project Project No. : S27-14

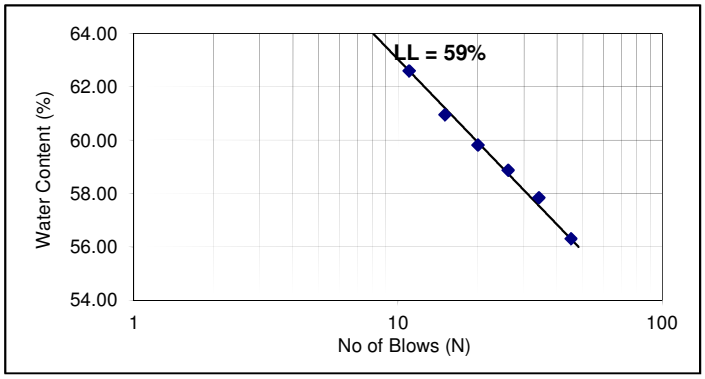
Standard : ASTM D4318-10 Date of Testing : 08.12.14

Tested By : Vasantha Checked By : A. B. Tan

Sample No. : PP21-3 HP-1 Depth : 1.00-1.90m

Remarks : Tested on material at natural state

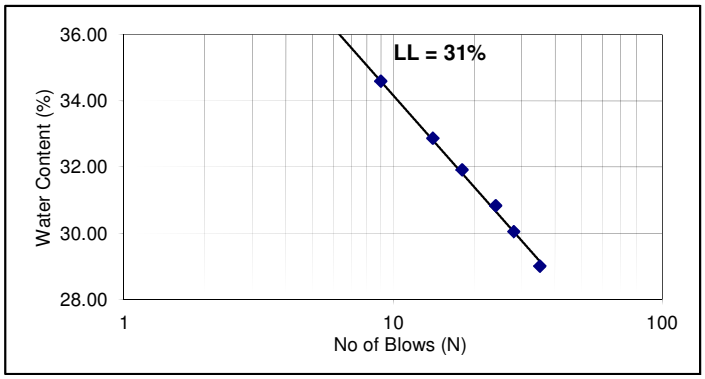
Liquid Limits Test		
Test No.	Blows	Wn
1	45	56.31
2	34	57.85
3	26	58.87
4	20	59.81
5	15	60.95
6	11	62.59
Liquid Limits %		**59**
Plastic Limits %		**28**
Plasticity Index		**31**



Sample No. : PP21-3 D-1 Depth : 4.00-4.20m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	35	29.01
2	28	30.06
3	24	30.83
4	18	31.91
5	14	32.88
6	9	34.59
Liquid Limits %		**31**
Plastic Limits %		**20**
Plasticity Index		**11**



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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 : **05.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

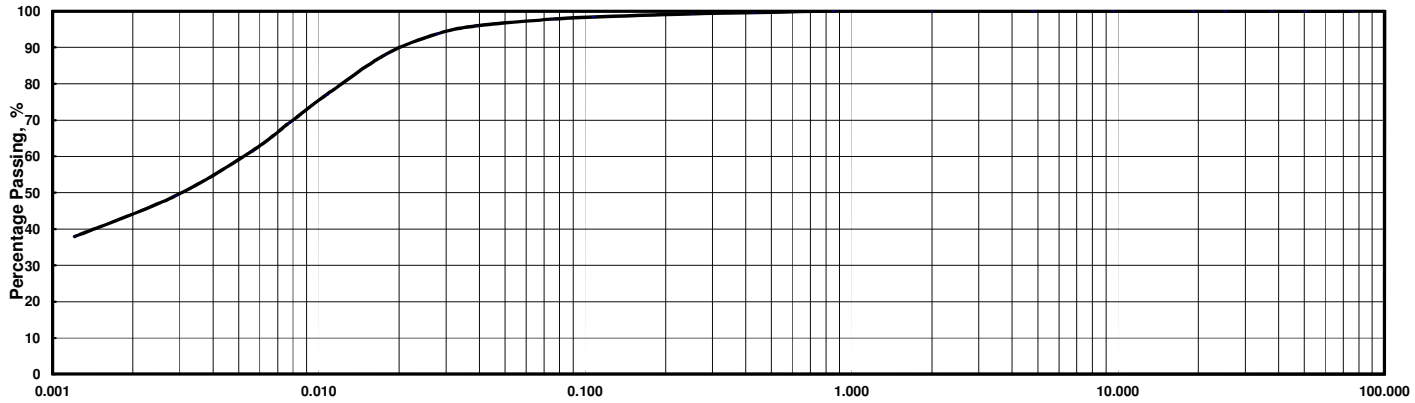
Sample No. : **PP-21-3 HP-1** Depth : **1.00-1.90m** ( ) Specific Gravity : 2.74

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	99.5	99.2	98.3	97.8
Hydro.	Dia., mm	0.039	0.028	0.018	0.011	0.0077	0.0056	0.0029	0.0012							
	% Passing	95.9	93.7	88.1	77.0	69.1	61.3	49.1	37.9							

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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. Depth	PP-21-3 HP-1 1.00-1.90m		Sample No. Depth	PP-21-3 HP-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%	0.0052 mm	
2.00 - 0.425 mm	0.5 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	1.8 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	39.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	58.7 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	97.8 %				

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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 : **06.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

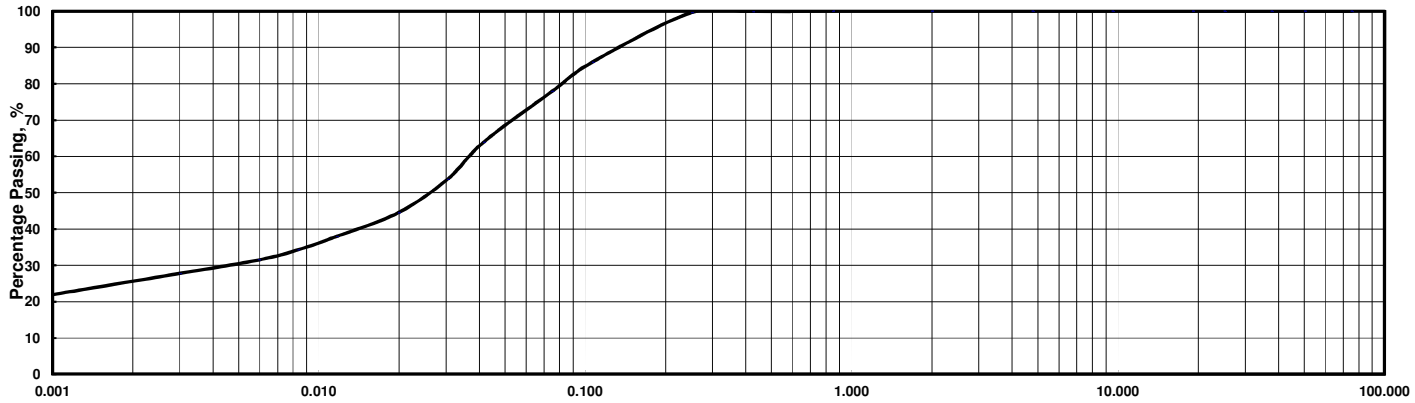
Sample No. : **PP-21-3 D-1** Depth : **4.00-4.20m** ( ) Specific Gravity : 2.72

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	99.6	85.9	77.9
Hydro.	Dia., mm	0.041	0.030	0.020	0.012	0.0083	0.0059	0.0030	0.0009							
	% Passing	63.9	53.7	44.5	38.0	34.3	31.5	27.8	21.3							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP-21-3 D-1 4.00-4.20m		Sample No. Depth	PP-21-3 D-1 4.00-4.20m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.037 mm	
2.00 - 0.425 mm	0.2 %		Dia. at 30%	0.0045 mm	
0.425 - 0.075 mm	21.9 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	47.6 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	30.3 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	77.9 %				

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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 : **06.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

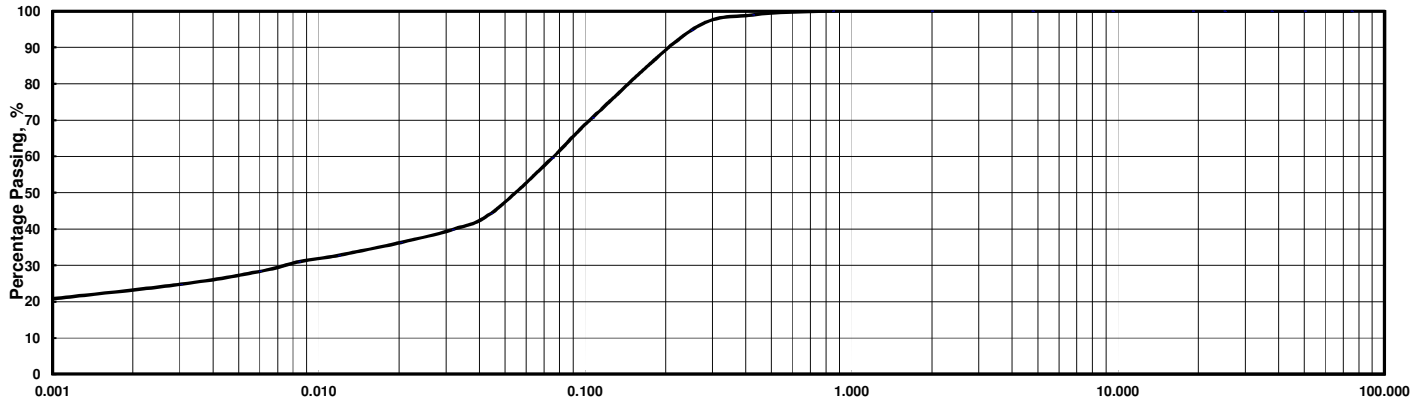
Sample No. : **PP-21-3 HP-2** Depth : **5.00-5.90m** ( ) Specific Gravity : 2.71

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	98.9	94.8	70.6	59.6
Hydro.	Dia., mm	0.044	0.032	0.020	0.012	0.0084	0.0060	0.0030	0.0009							
	% Passing	44.3	39.9	36.3	32.8	31.0	28.3	24.8	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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP-21-3 HP-2 5.00-5.90m		Sample No. Depth	PP-21-3 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%	0.076 mm	
2.00 - 0.425 mm	1.1 %		Dia. at 30%	0.0074 mm	
0.425 - 0.075 mm	39.4 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	32.4 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	27.1 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	59.6 %				

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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 : **06.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

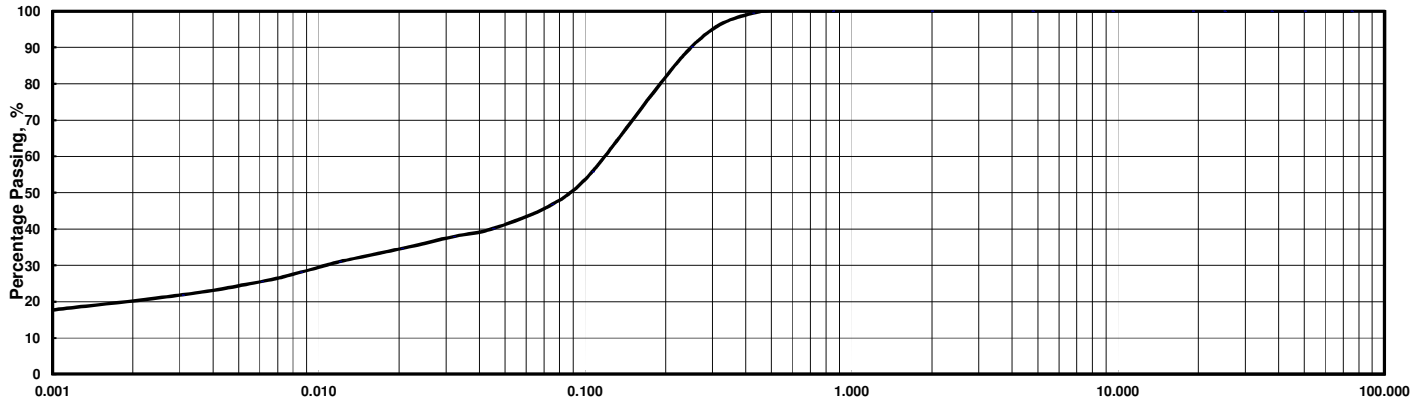
Sample No. : **PP-21-3 D-2** Depth : **7.00-7.75m** ( ) Specific Gravity : 2.70

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	100.0	100.0	99.4	90.1	55.8	46.8
Hydro.	Dia., mm	0.045	0.032	0.020	0.012	0.0085	0.0061	0.0031	0.0009							
	% Passing	40.1	37.9	34.7	31.0	28.1	25.5	21.9	17.3							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP-21-3 D-2 7.00-7.75m		Sample No. Depth	PP-21-3 D-2 7.00-7.75m	
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	0.6 %		Dia. at 30%	0.011 mm	
0.425 - 0.075 mm	52.7 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	22.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	24.2 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	46.8 %				

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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 : **06.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

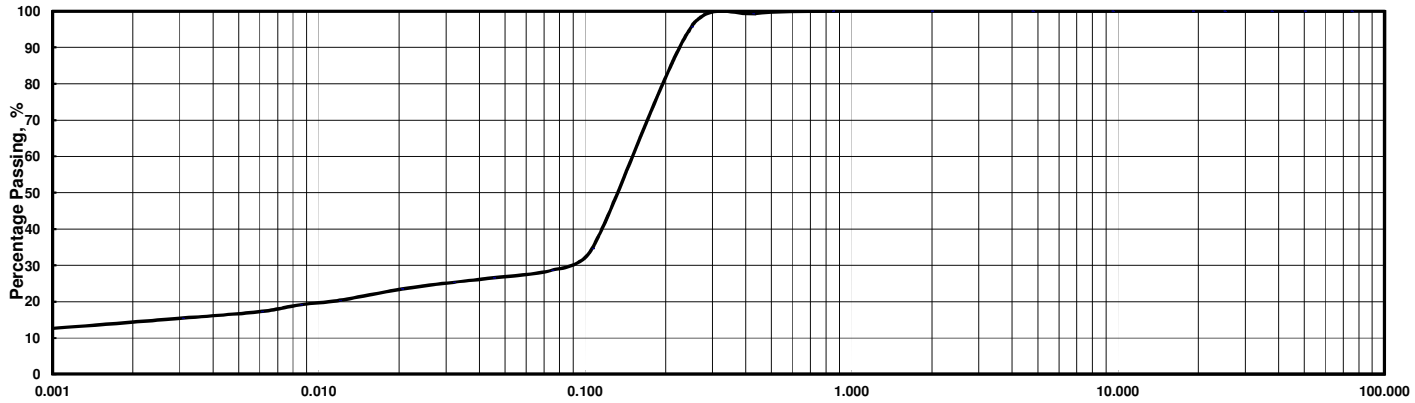
Sample No. : **PP-21-3 D-3** Depth : **11.00-11.90m** ( ) Specific Gravity : 2.70

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	100.0	99.3	95.7	34.6	28.7
Hydro.	Dia., mm	0.045	0.032	0.020	0.012	0.0085	0.0061	0.0031	0.0009							
	% Passing	26.6	25.3	23.5	20.4	19.2	17.3	15.5	12.4							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP-21-3 D-3 11.00-11.90m		Sample No. Depth	PP-21-3 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%	0.15 mm	
2.00 - 0.425 mm	0.7 %		Dia. at 30%	0.081 mm	
0.425 - 0.075 mm	70.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	12.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	16.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	28.7 %				

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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 : 01.12.14

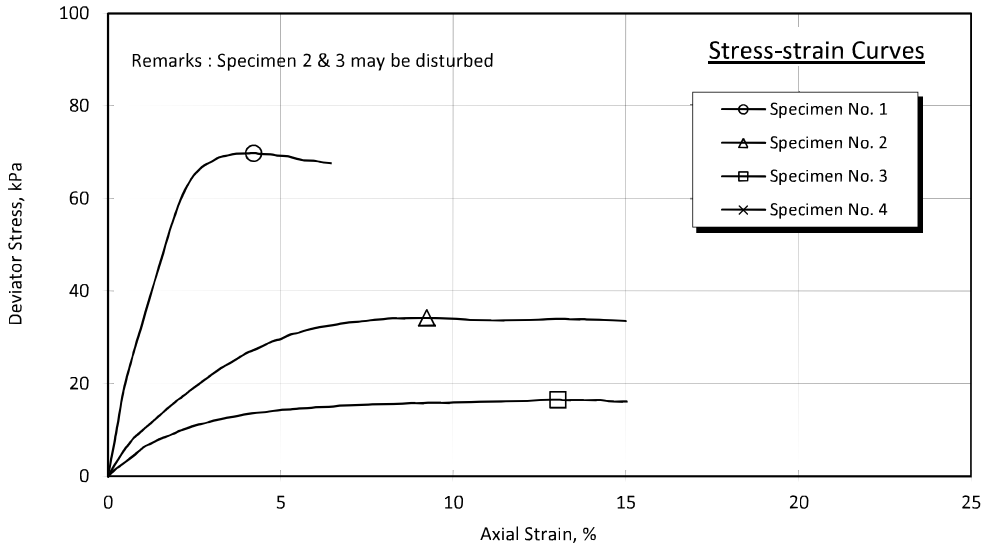
Borehole No.: PP-21-3 Depth 1.00-1.90m

Tested by : Perera

Sample No. : HP-1 Strain Rate 1.00 %/min

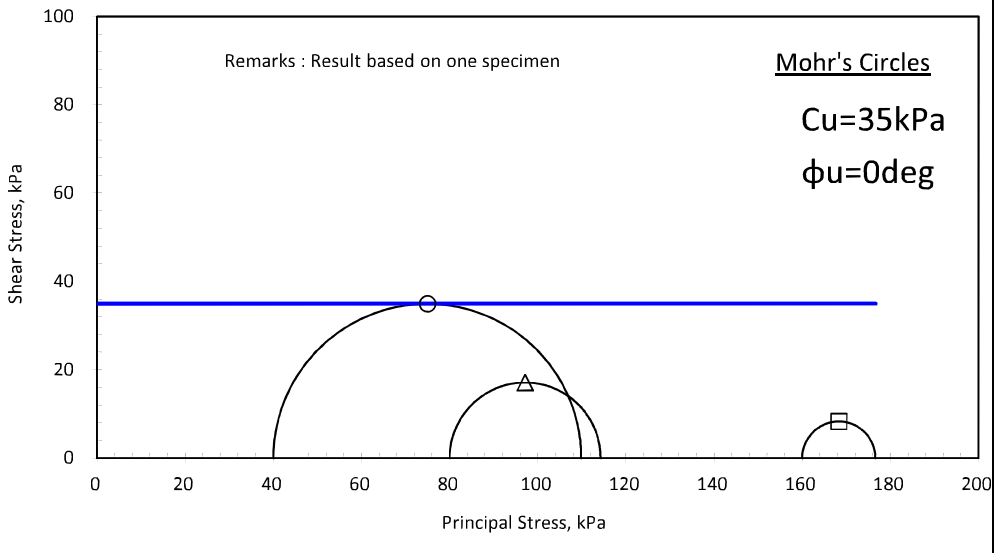
Checked by : A. B. Tan

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	47.0	1.78	1.21	40	69.8	3281	N/A	4.21
2	Undisturbed	99.80	50.10	50.8	1.75	1.16	80	34.2	803	N/A	9.23
3	Undisturbed	99.80	50.10	49.0	1.74	1.17	160	16.6	525	N/A	13.03
4											




After shearing (Spec. 1)


After shearing (Spec. 2)

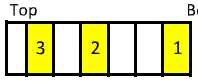



After shearing (Spec. 3)

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



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CONSOLIDATION TEST (e-log p curves)

Preparatory Survey on Matarbari USC Coal-fired Power

Project : Project

Project No.: S27-14 Tested by : Lim

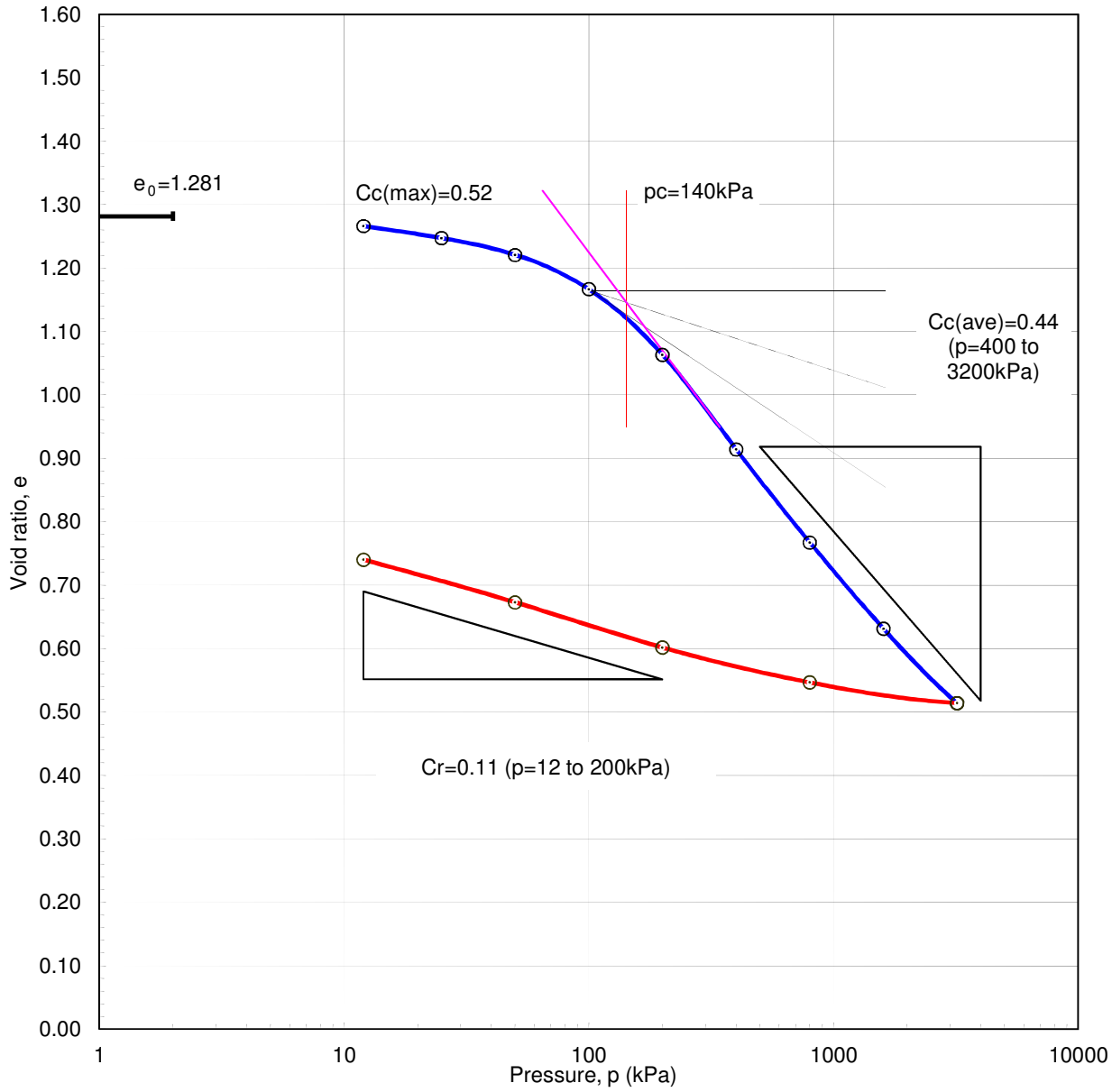
Soil Type : 0 Checked by : A. B. Tan

Borehole No. : PP-21-3

Sample No. : HP-1

Depth of Sample : 1.00-1.90 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	1.00-1.90	1.281	140	0.52 (max)	0.44(average)	0.11 (average)	N/A



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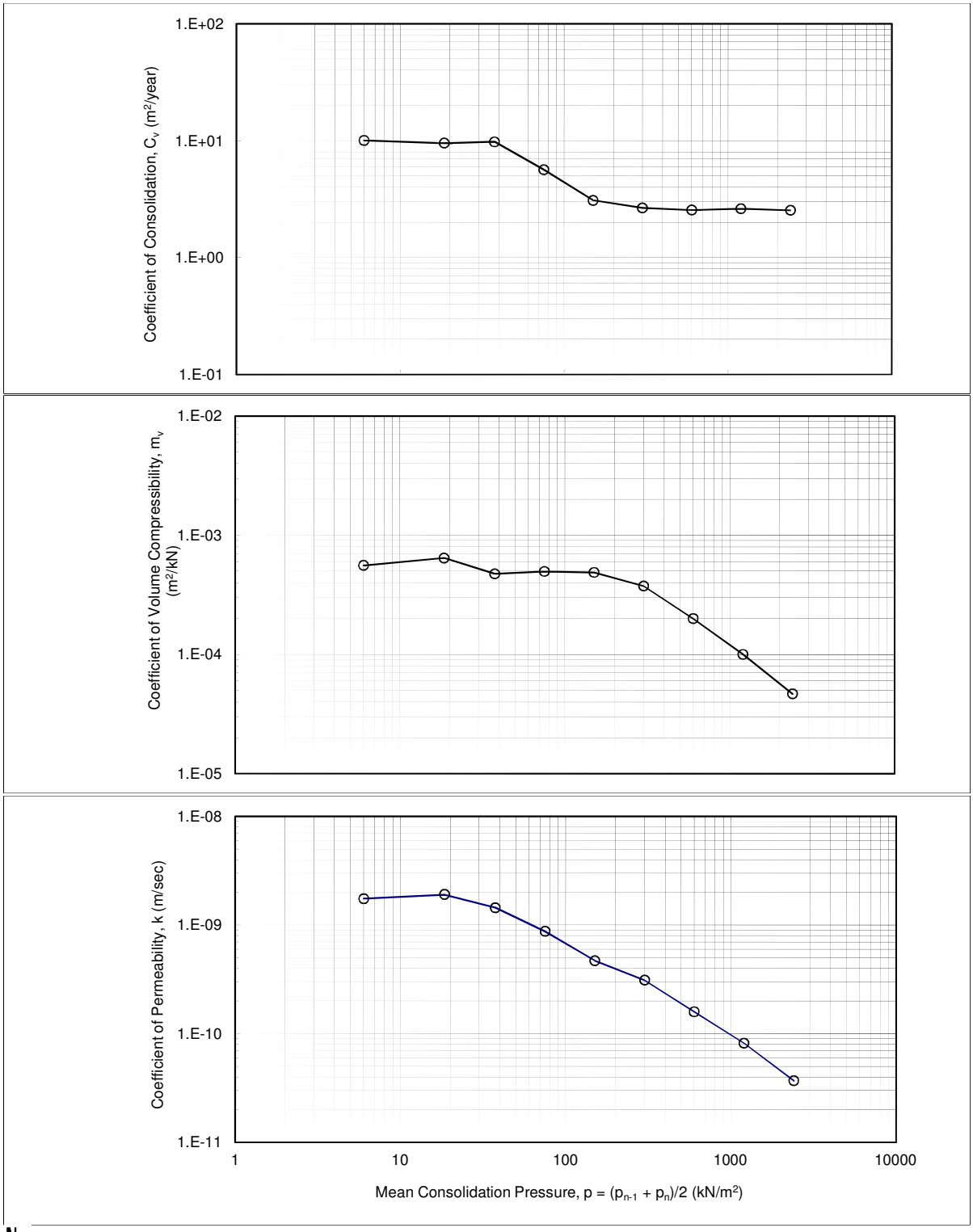
Consolidation Test (p - $\overline{cv}$, mv , k curves)

Project	:	Preparatory Survey on Matarbari USC Coal-fired Power Project		Borehole No. :	PP-21-3
Project No.	:	S27-14		Sample No. :	HP-1
Date of testing	:	21-Nov-14	Tested by : Lim	Depth of Sample :	1.00-1.90 m



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PROJECT NAME : Preparatory Survey on Matarbari USC Coal-fired Power Project
PROJECT NO. : S27-14
BOREHOLE NO. : PP-21-3
TESTING STANDARD : ASTM D2435-11
DATE : 21-Nov-14
SAMPLE NO. : HP-1
INITIAL HEIGHT OF SPECIMEN : 18.000 mm
NO. OF LOADING STEP : 9
DEPTH : 1.00-1.90 m
DIAMETER OF SPECIMEN : 53.900 mm
SPECIFIC GRAVITY : 2.74
TESTER NO. : 11
DRY WEIGHT OF SPECIMEN : 49.310 grams
SOLID HEIGHT OF SPECIMEN : 7.890 mm
INITIAL MOISTURE CONTENT : 46.0 %
BULK DENSITY : 1.78 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				2.281	1.281
	12.000	12.0		17.940	0.67	5.57E-04		
12.000			17.880				2.266	1.266
	13.000	14.9		17.806	0.84	6.44E-04		
25.000			17.731				2.247	1.247
	25.000	20.9		17.627	1.19	4.74E-04		
50.000			17.522				2.221	1.221
	50.000	42.9		17.308	2.48	4.96E-04		
100.000			17.093				2.166	1.166
	100.000	81.4		16.686	4.88	4.88E-04		
200.000			16.279				2.063	1.063
	200.000	117.6		15.691	7.49	3.75E-04		
400.000			15.103				1.914	0.914
	400.000	115.9		14.524	7.98	2.00E-04		
800.000			13.944				1.767	0.767
	800.000	107.2		13.408	8.00	9.99E-05		
1600.000			12.872				1.631	0.631
	1600.000	92.6		12.409	7.46	4.66E-05		
3200.000			11.946				1.514	0.514

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	3.31	3.19E-07	2.76E-02	1.01E+01	4.9	0.407	1.75E-09
12.000								
	18.500	3.45	3.02E-07	2.61E-02	9.53E+00	6.6	0.440	1.91E-09
25.000								
	37.500	3.29	3.11E-07	2.68E-02	9.79E+00	9.5	0.456	1.44E-09
50.000								
	75.000	5.48	1.79E-07	1.55E-02	5.66E+00	22.0	0.513	8.73E-10
100.000								
	150.000	9.34	9.79E-08	8.46E-03	3.09E+00	45.8	0.562	4.69E-10
200.000								
	300.000	9.59	8.44E-08	7.29E-03	2.66E+00	77.1	0.656	3.10E-10
400.000								
	600.000	8.56	8.10E-08	7.00E-03	2.55E+00	77.7	0.671	1.58E-10
800.000								
	1200.000	7.09	8.33E-08	7.19E-03	2.63E+00	67.5	0.630	8.16E-11
1600.000								
	2400.000	6.28	8.06E-08	6.96E-03	2.54E+00	59.3	0.641	3.69E-11
3200.000								

REBOUND

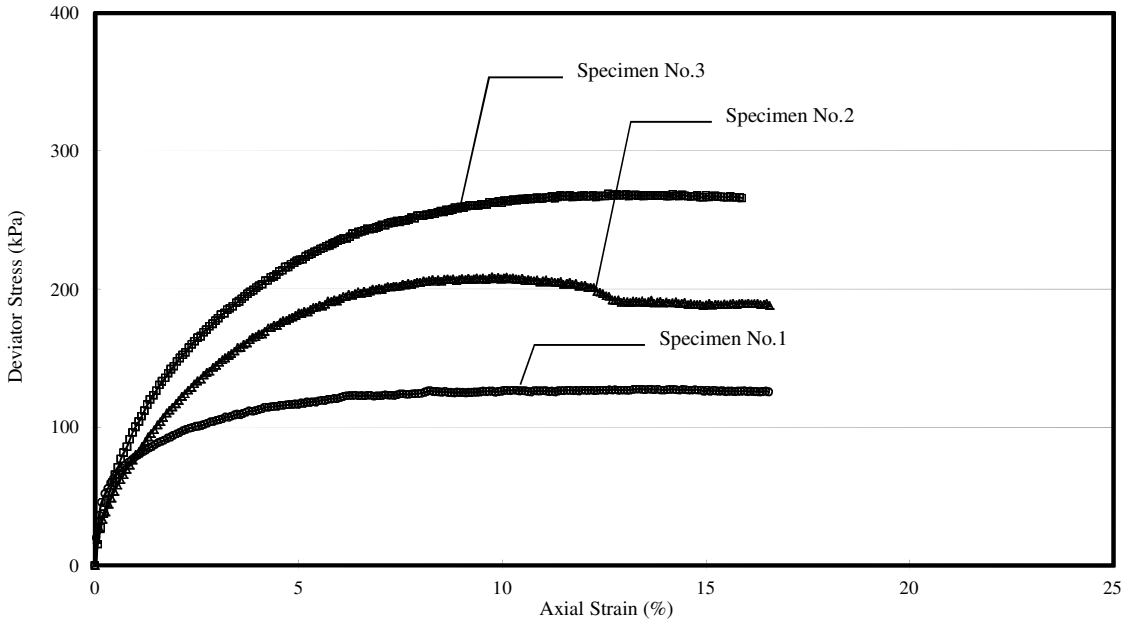
P	800.000	200.000	50.000	12.000
H	12.203	12.638	13.200	13.730
E	0.547	0.602	0.673	0.740

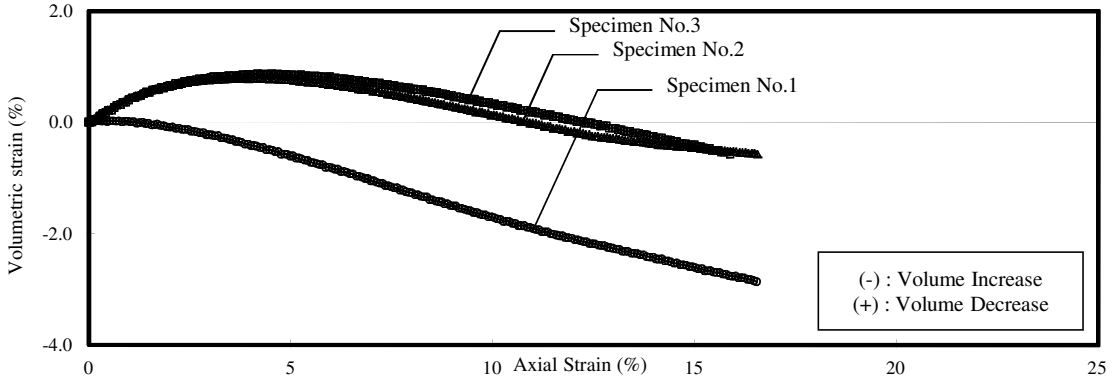
Summary of Consolidated Drained Triaxial Compression Test

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.: PP-21-3		Sample No.:D-3		Depth :11.00-11.90m			
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	1.52	1.52	1.52		
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	227	254	283		
	Final PWP	kPa	200	200	200		
Consolidation Parameter	Volume Change,	%	0.13	0.19	0.13		
	Coefficient of Consolidation Cv,	m^2/year	34.92	14.49	20.65		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.03	0.03	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	128	209	269		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	-2.32	0.18	-0.04		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	13.30	9.74	12.64		
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)= 1.52 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.: PP-21-3 Depth : 11.00-11.90m





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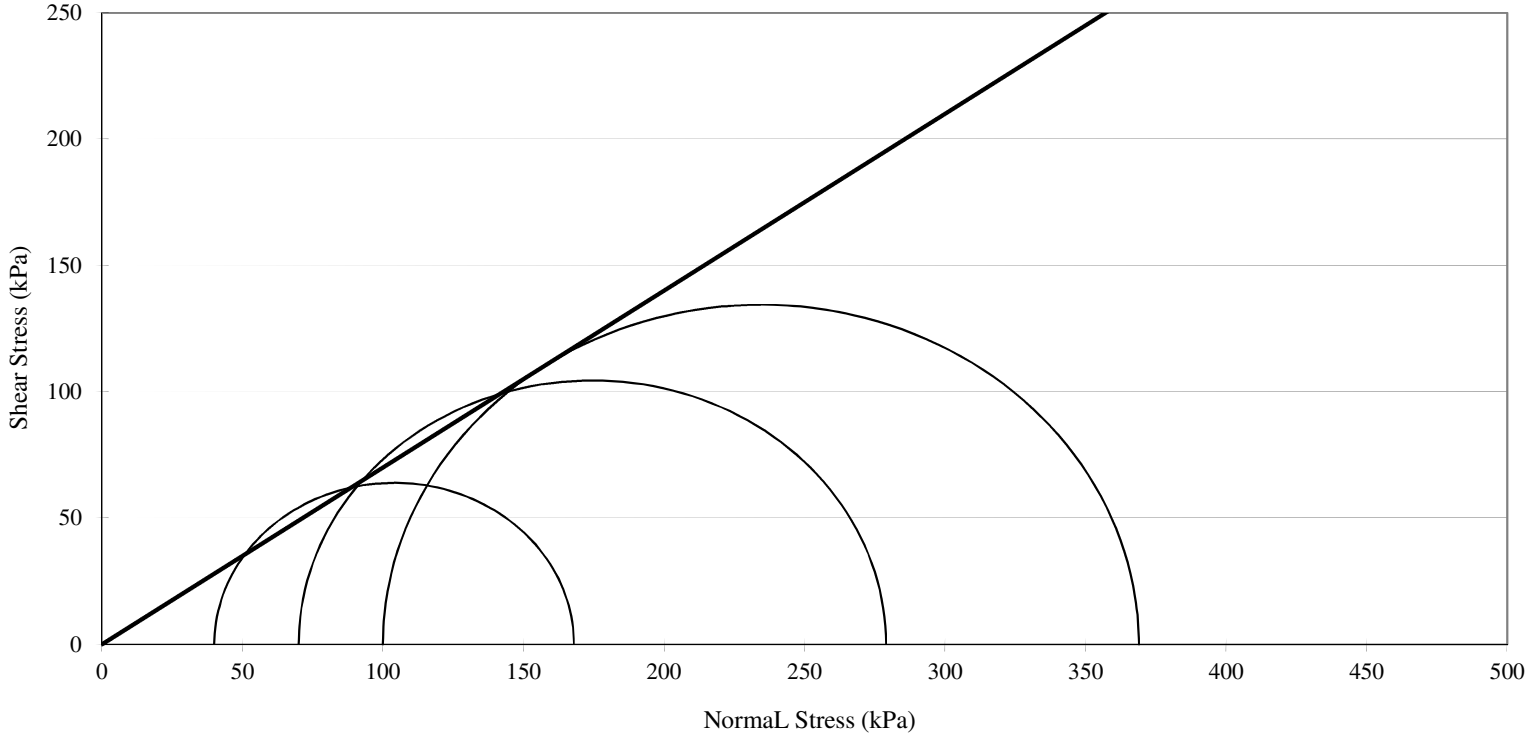
Consolidated Drained Triaxial Compression Test

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

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14

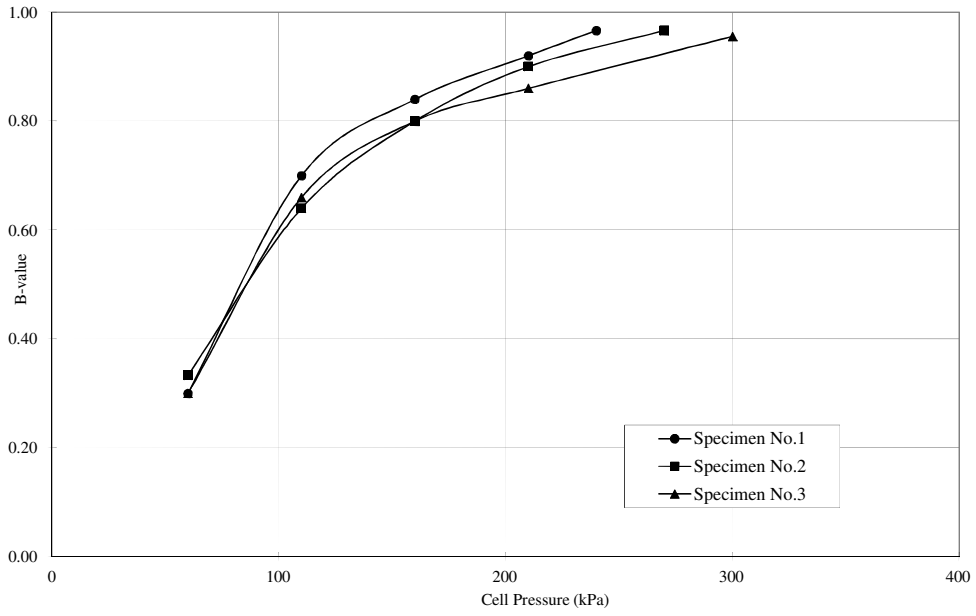
Borehole No. : PP-21-3 Soil Type: Clayey Sand
Sample No. : D-3 Depth : 11.00-11.90m
Angle of Internal Friction, ϕ 35 deg
Cohesion, c 0 kPa



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.: PP-21-3 Depth : 11.00-11.90m
Sample No.: D-3 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	30	20	29
	Back Pressure (kPa)	20		20		20	
	B-value	0.30		0.33		0.30	
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110
	P.W.P (kPa)	50	85	50	82	50	83
	Back Pressure (kPa)	50		50		50	
	B-value	0.70		0.64		0.66	
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160
	P.W.P (kPa)	100	142	100	140	100	140
	Back Pressure (kPa)	100		100		100	
	B-value	0.84		0.80		0.80	
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210
	P.W.P (kPa)	150	196	150	195	150	193
	Back Pressure (kPa)	150		150		150	
	B-value	0.92		0.90		0.86	
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	



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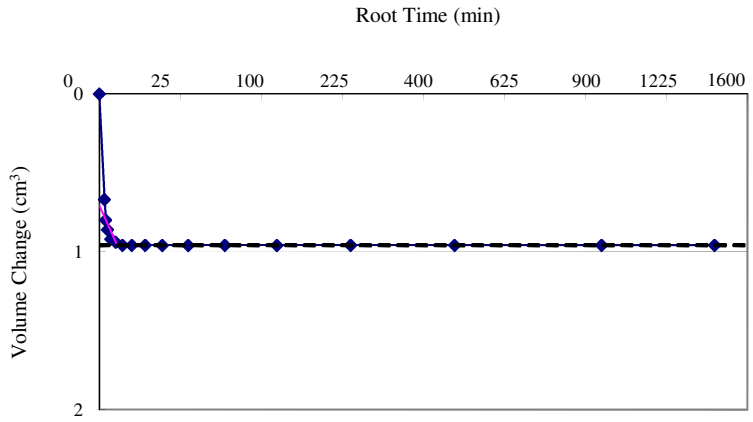
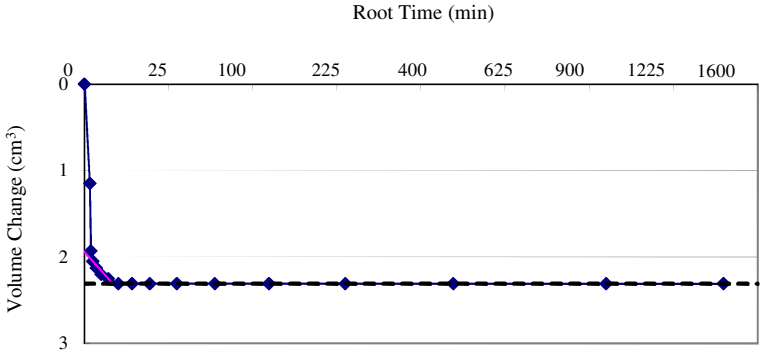
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-3 Soil Type: Clayey Sand
Borehole No.: PP-21-3 Depth : 11.00-11.90m



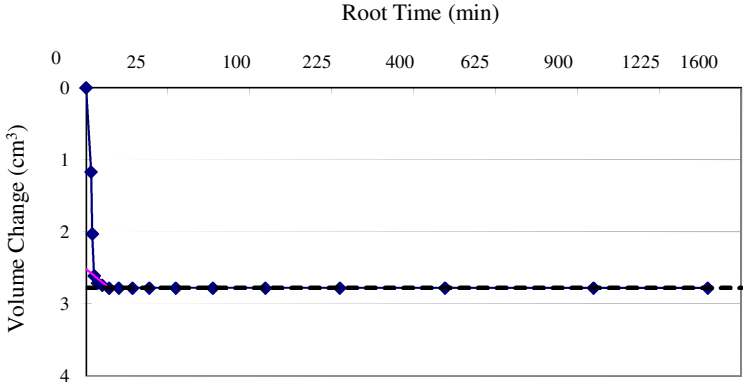
Specimen No.: 1

p' =	40	kPa
t100 =	1.2	min
Cv =	34.92	m^2/year
mvi=	0.03	m^2/MN



Specimen No.: 2

p' =	70	kPa
t100 =	2.9	min
Cv =	14.49	m^2/year
mvi=	0.03	m^2/MN



Specimen No.: 3

p' =	100	kPa
t100 =	2.0	min
Cv =	20.65	m^2/year
mvi=	0.01	m^2/MN

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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

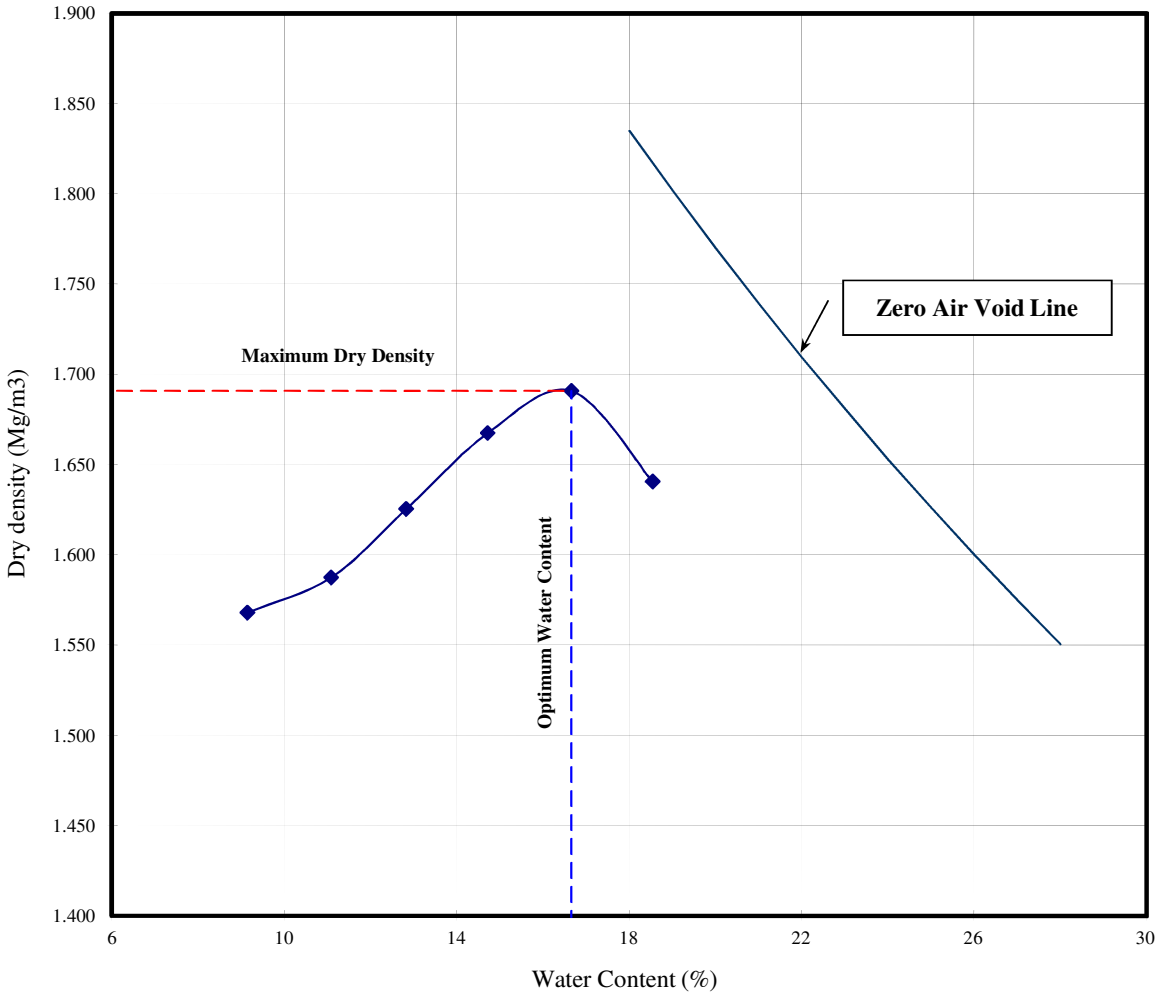
Sampling Date : - **Date of Testing :** 9-Dec-14 **Tested by :** Perera/Bala

Sample No. : PP21-3 D-3(11.00-11.90m) **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	11.1	12.8	14.7	16.7	18.5		
Wet Density (Mg/m3)	1.711	1.764	1.834	1.913	1.972	1.945		
Dry Density (Mg/m3)	1.568	1.588	1.625	1.667	1.691	1.641		

Maximum Dry Density	**1.691 Mg/m3**
Optimum Water Content	**16.7 %**



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33) PP-24-1

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TABLE SUMMARY OF SOIL TEST

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

Borehole No.			PP-24-1								
Sample No.			HP-1	HP-2	D-1	D-2	D-3				
Sample Depth			2.00m ~2.85m	5.00m ~5.90m	8.00m ~8.85m	11.00m ~11.60m	14.00m ~14.85m				
Condition of Sample			Undisturbed		Disturbed						
Natural Water Content		%	44.5	49.1	24.0	23.6	24.7				
Specific Gravity			2.75	2.74	2.68	2.69	2.71				
Wet Density		Mg/m^3	1.76	1.71	-	-	1.92				
Dry Density		Mg/m^3	1.22	1.14	-	-	1.54				
Natural Void Ratio			1.25	1.39	-	-	0.76				
Degree of Saturation		%	98	97	-	-	88				
Atterberg Limits	Liquid Limit,	%	49	49	- *3	- *3	- *3				
	Plastic Limit,	%	24	25	- *3	- *3	- *3				
	Plasticity Index,	%	25	24	- *3	- *3	- *3				
Grain Size Analysis	Gravel,	%	0	0	0	0	0				
	Sand,	%	2	2	66	69	54				
	Silt,	%	39	42	14	11	19				
	Clay & Colloid,	%	59	56	20	20	27				
	Max. diameter,	mm	0.106	0.106	2.00	0.85	0.850				
	Diam. at 60%	mm	0.0052	0.0059	0.14	0.15	0.114				
	Diam. at 10%	mm	-		-	-	-				
Visual soil description			Silty Clay	Silty Clay	Clayey Sand	Clayey Sand	Clayey Sand				
Unified soil classification			CL	CL	-	-	-				
Triaxial compression test	Angle of Internal Friction	(^{0})	0	0	-	-	-				
	Cohesion Intercept, kPa		10	15	-	-	-				
	Condition of drainage		UU	UU	-	-	-				
	Angle of Internal Friction *2	(^{0})	-	-	-	-	-				
	Cohesion Intercept, kPa *2		-	-	-	-	-				
	Condition of drainage		-	-	-	-	-				
Consolidation Test	Preconsolidation Pressure,	kPa	35	57	-	-	-				
	Compression Index(Average)		0.42	0.44	-	-	-				
	Pressure Range for Compression Index(kPa)		200-1600	200-1600	-	-	-				
	Swell index		0.14	0.13	-	-	-				
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

Checked by : A. B. Tan

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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

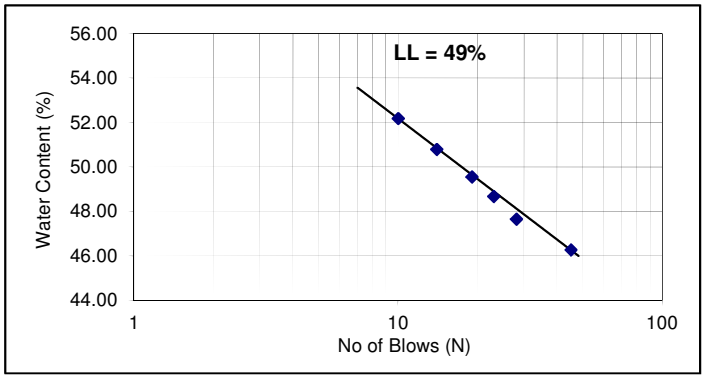
Tested By : Vasantha Checked By : A. B. Tan

Sample No. : PP-24-1 HP-1 Depth : 2.00-2.85m

Remarks : Tested on material at natural state

%

Liquid Limits Test		
Test No.	Blows	Wn
1	45	46.27
2	28	47.65
3	23	48.68
4	19	49.54
5	14	50.79
6	10	52.16
Liquid Limits %		**49**
Plastic Limits %		**24**
Plasticity Index		**25**

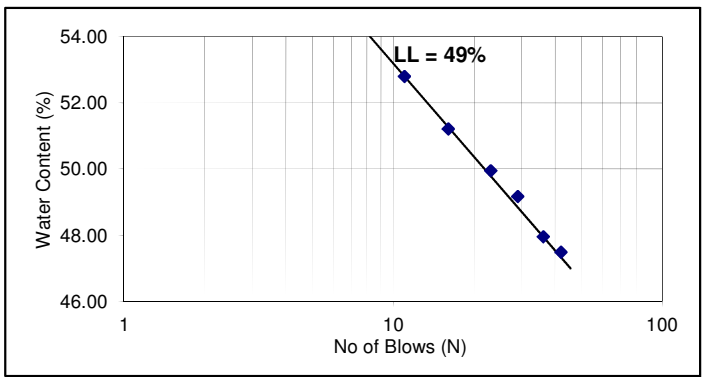


Sample No. : PP-24-1 HP-2 Depth : 5.00-5.90m

Remarks : Tested on material at natural state

%

Liquid Limits Test		
Test No.	Blows	Wn
1	42	47.49
2	36	47.96
3	29	49.17
4	23	49.95
5	16	51.21
6	11	52.80
Liquid Limits %		**49**
Plastic Limits %		**25**
Plasticity Index		**24**



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Singapore Branch

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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**

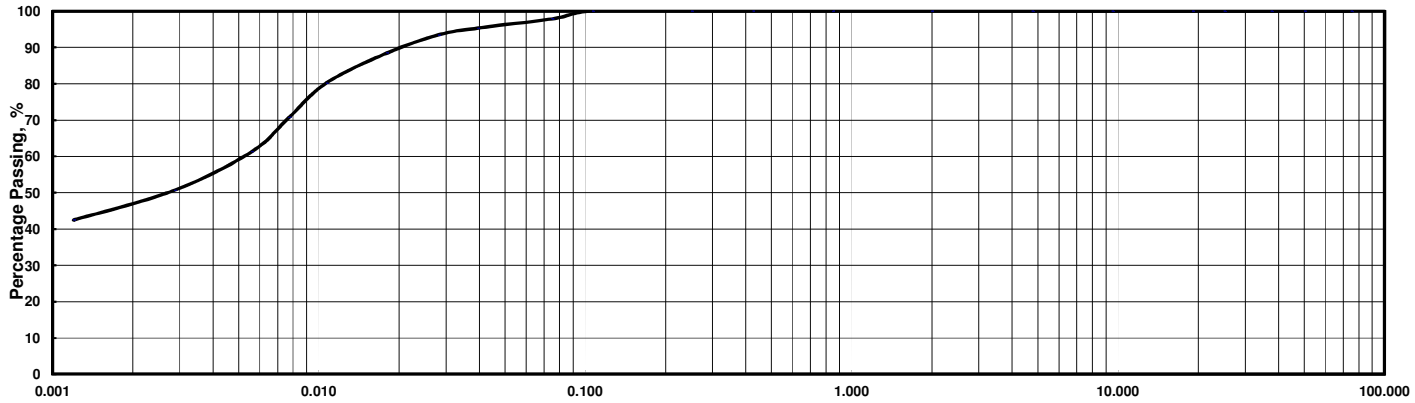
Sample No. : **PP-24-1 HP-1** Depth : **2.00-2.85m** ( ) Specific Gravity : 2.75

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	97.9
Hydro.	Dia., mm	0.039	0.028	0.018	0.011	0.0077	0.0056	0.0029	0.0012							
	% Passing	95.3	93.4	88.5	80.2	70.8	61.3	50.7	42.5							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP-24-1 HP-1 2.00-2.85m		Sample No. Depth	PP-24-1 HP-1 2.00-2.85m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.106 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.0052 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	2.1 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	38.9 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	59.0 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	97.9 %				

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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**

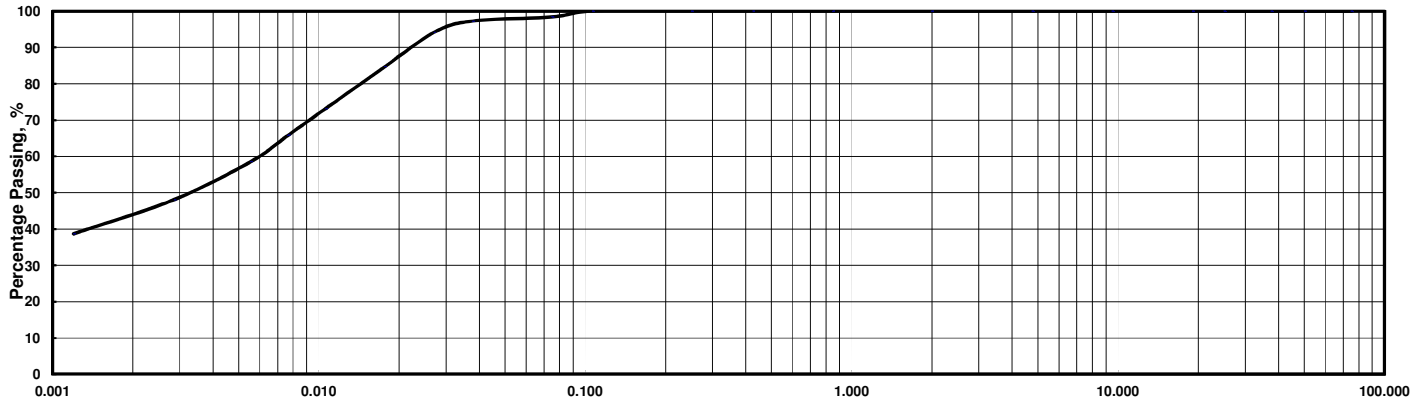
Sample No. : **PP-24-1 HP-2** Depth : **5.00-5.90m** ( ) Specific Gravity : 2.74

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	100.0	100.0	100.0	98.4
Hydro.	Dia., mm	0.038	0.027	0.018	0.011	0.0077	0.0055	0.0029	0.0012							
	% Passing	97.3	94.1	84.7	73.2	65.9	58.6	48.1	38.7							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP-24-1 HP-2 5.00-5.90m		Sample No. Depth	PP-24-1 HP-2 5.00-5.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.106 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.0059 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	1.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	42.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	56.4 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	98.4 %				

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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**

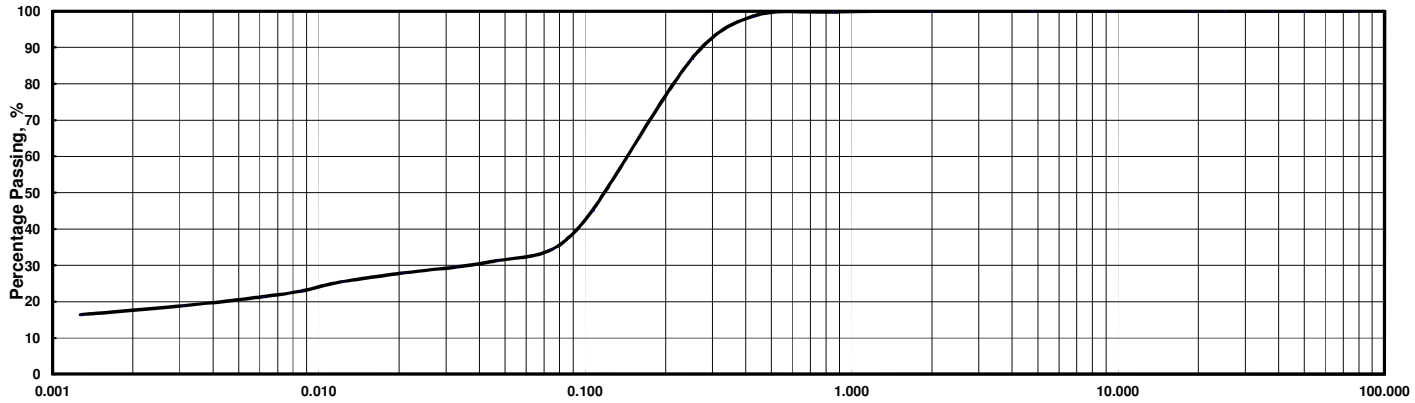
Sample No. : **PP-24-1 D-1** Depth : **8.00-8.85m** ( ) Specific Gravity : 2.68

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	99.7	98.6	86.8	45.0	34.4
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	31.2	29.6	27.9	25.5	23.0	21.4	18.9	16.4							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP-24-1 D-1 8.00-8.85m		Sample No. Depth	PP-24-1 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%	0.14 mm	
2.00 - 0.425 mm	1.4 %		Dia. at 30%	0.036 mm	
0.425 - 0.075 mm	64.2 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	14.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	20.4 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.7 %				
75um Sieve Passing	34.4 %				

Kiso-Jiban Consultants Co., Ltd.

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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**

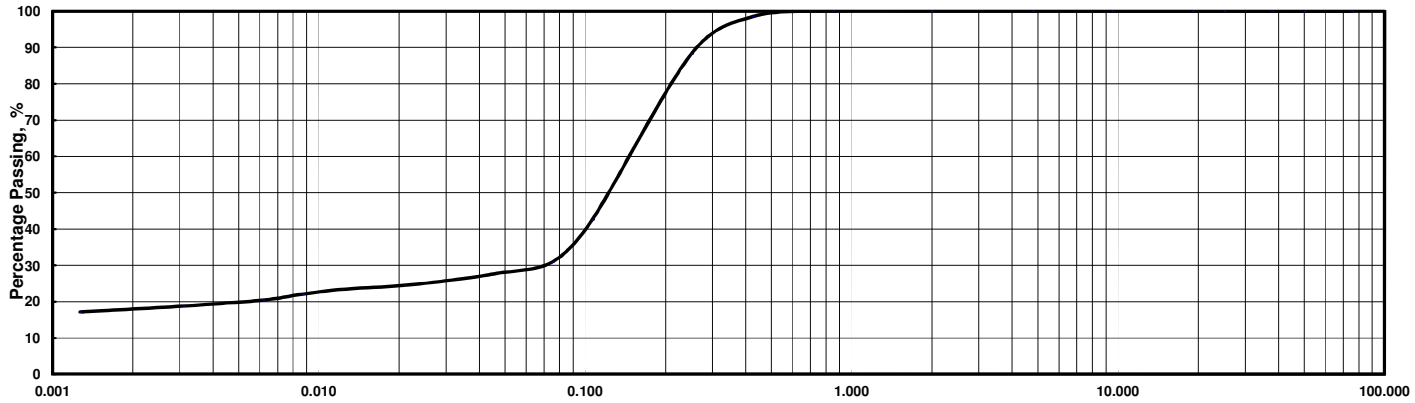
Sample No. : **PP-24-1 D-2** Depth : **11.00-11.60m** ( ) Specific Gravity : 2.69

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	98.5	88.3	42.6	30.9
Hydro.	Dia., mm	0.047	0.033	0.021	0.012	0.0087	0.0062	0.0031	0.0013							
	% Passing	27.8	26.2	24.5	23.4	22.1	20.4	18.8	17.2							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP-24-1 D-2 11.00-11.60m		Sample No. Depth	PP-24-1 D-2 11.00-11.60m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.85 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.15 mm	
2.00 - 0.425 mm	1.5 %		Dia. at 30%	0.065 mm	
0.425 - 0.075 mm	67.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	11.1 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	19.8 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	30.9 %				

Kiso-Jiban Consultants Co., Ltd.

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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**

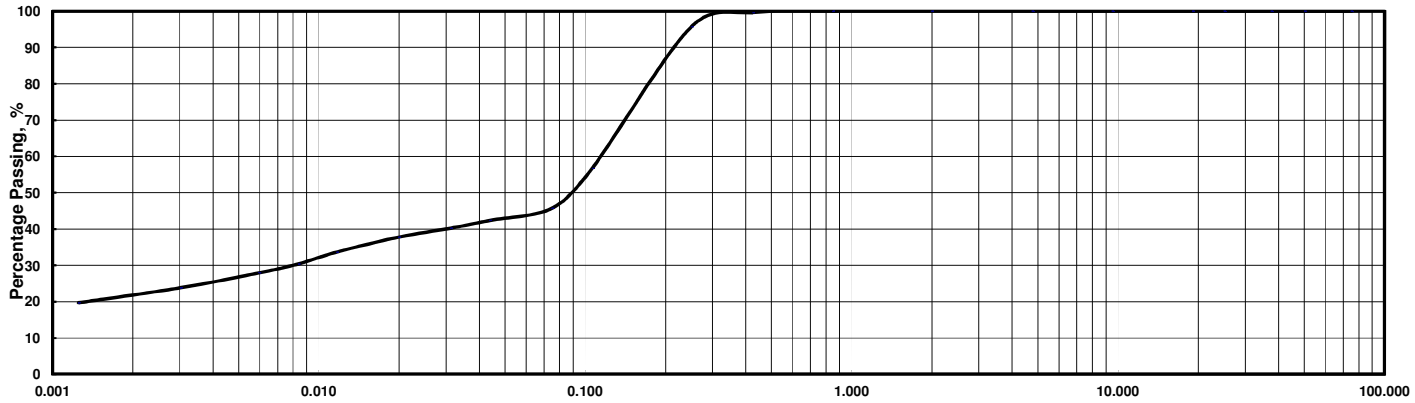
Sample No. : **PP-24-1 D-3** Depth : **14.00-14.85m** ( ) Specific Gravity : 2.71

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	99.6	95.7	56.7	45.7
Hydro.	Dia., mm	0.044	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0012							
	% Passing	42.4	40.3	37.8	33.7	30.4	27.9	23.8	19.7							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP-24-1 D-3 14.00-14.85m		Sample No. Depth	PP-24-1 D-3 14.00-14.85m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.114 mm	
2.00 - 0.425 mm	0.4 %		Dia. at 30%	0.0079 mm	
0.425 - 0.075 mm	53.9 %		Dia. at 10%	#NUM! mm	
0.075 - 0.005 mm	19.1 %		Coeff. of Uniformity	#NUM!	
Smaller than 0.005 mm	26.6 %		Coeff. of Curvature	#NUM!	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	45.7 %				

Kiso-Jiban Consultants Co., Ltd.

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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

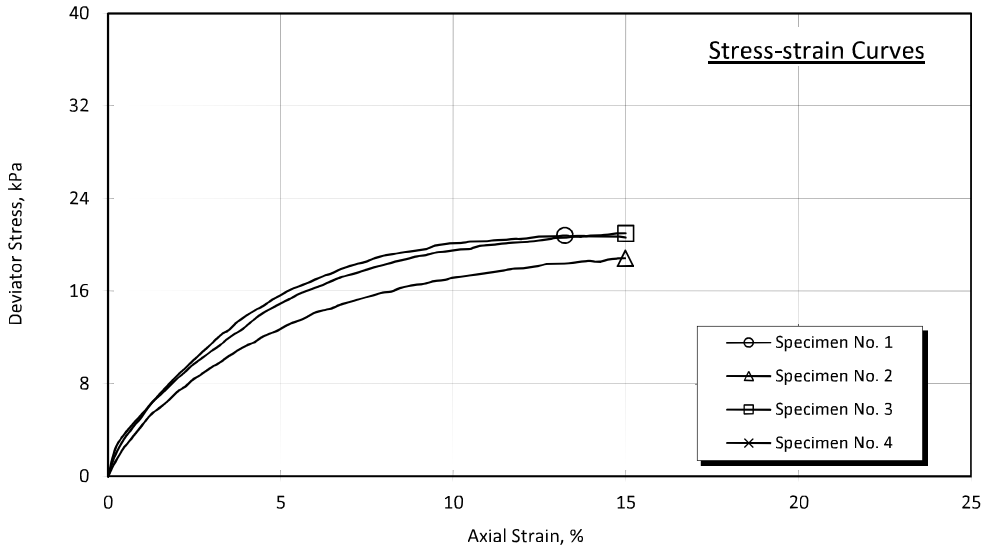
Borehole No.: PP-24-1 Depth 2.00-2.85m

Tested by : Perera

Sample No. : HP-1 Strain Rate 1.00 %/min

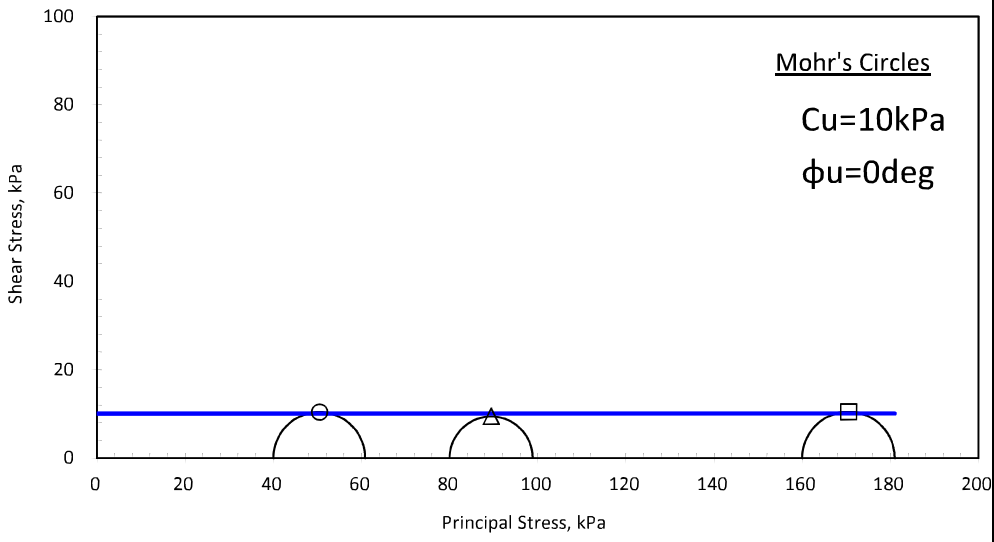
Checked by : A. B. Tan

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	49.9	1.70	1.13	40	20.8	399	N/A	13.23
2	Undisturbed	99.80	50.00	47.2	1.74	1.18	80	18.8	314	N/A	14.98
3	Undisturbed	99.80	50.00	45.7	1.74	1.19	160	21.0	369	N/A	14.99
4											




After shearing (Spec. 1)


After shearing (Spec. 2)

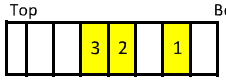



After shearing (Spec. 3)

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



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Singapore Branch

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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

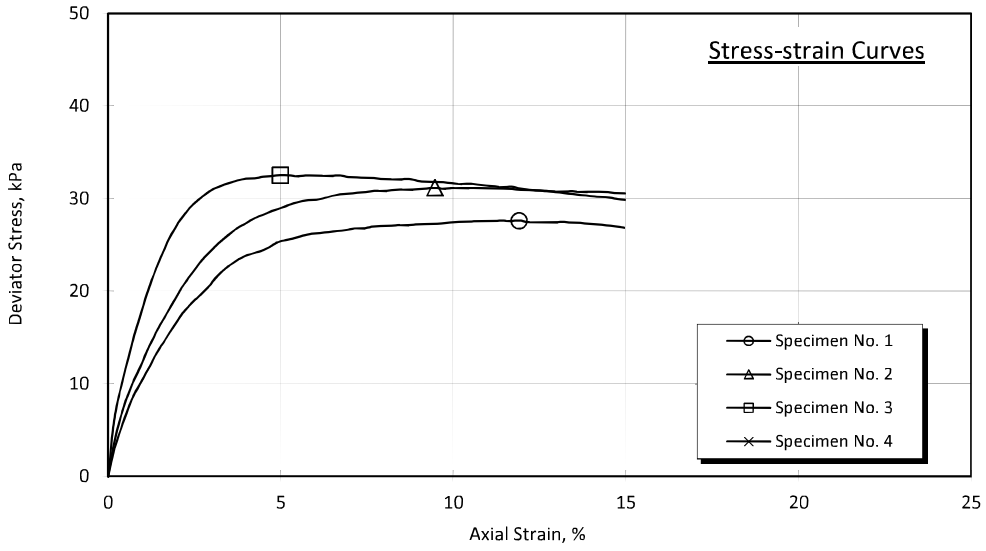
Borehole No.: PP-24-1 Depth 5.00-5.90m

Tested by : Perera

Sample No. : HP-2 Strain Rate 1.00 %/min

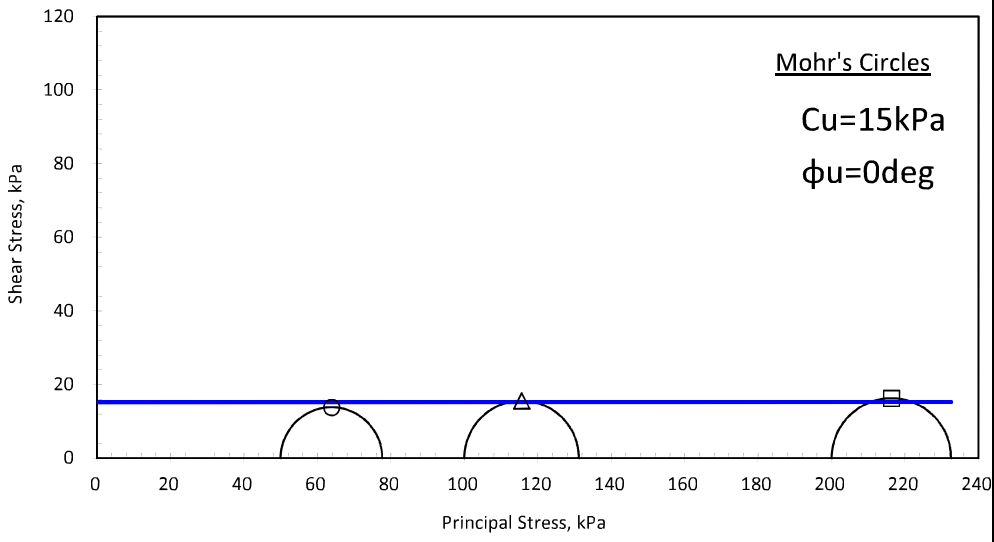
Checked by : A. B. Tan

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	49.7	1.68	1.12	50	27.6	926	N/A	11.90
2	Undisturbed	99.80	50.00	48.3	1.72	1.16	100	31.2	1114	N/A	9.47
3	Undisturbed	99.80	50.00	52.0	1.67	1.10	200	32.5	1920	N/A	4.99
4											




After shearing (Spec. 1)


After shearing (Spec. 2)

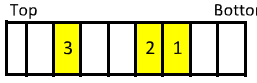



After shearing (Spec. 3)

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

Project No.: S27-14 Tested by : Lim

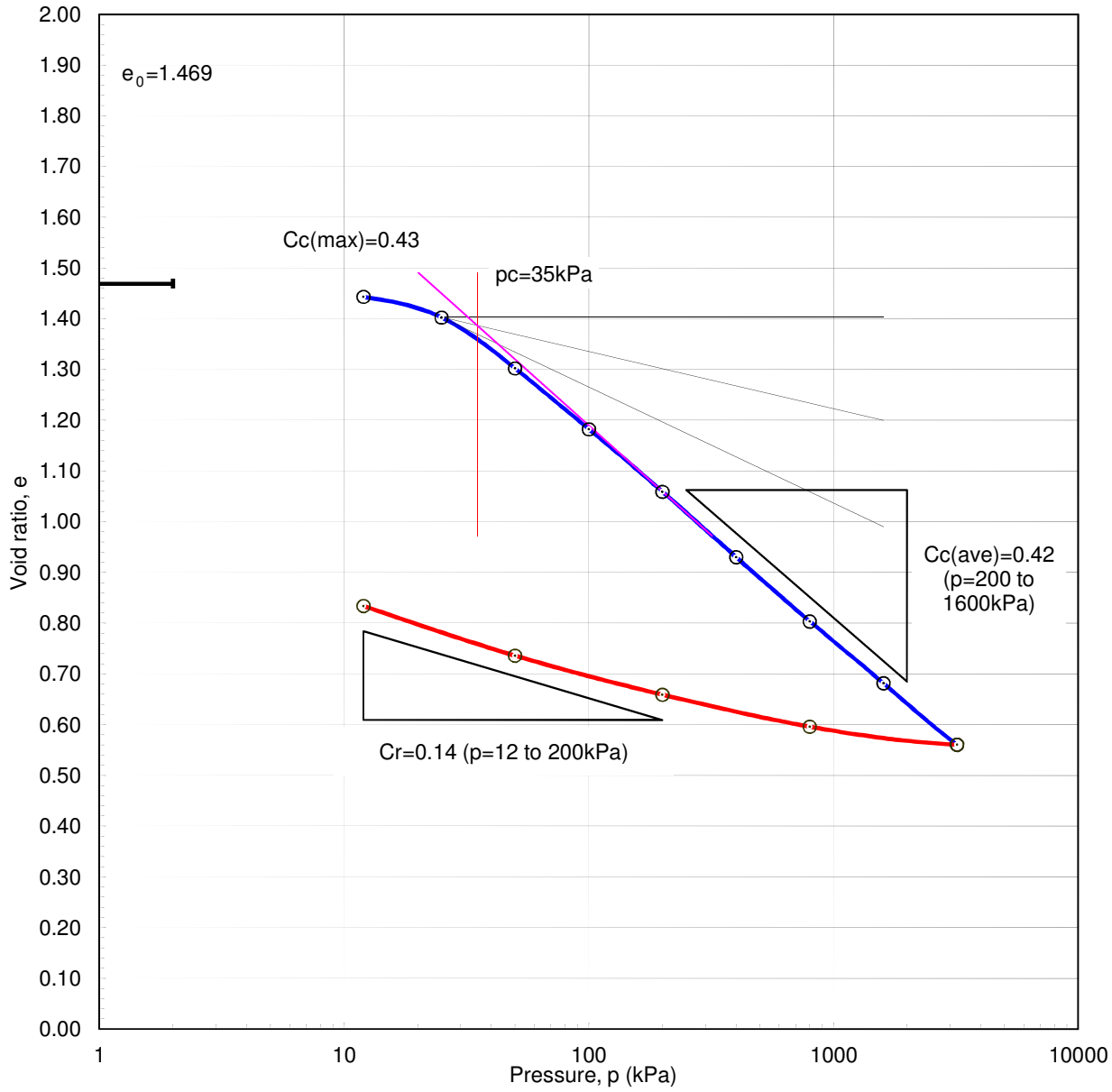
Soil Type : Clay Checked by : A. B. Tan

Borehole No. : PP-24-1

Sample No. : HP-1

Depth of Sample : 2.00-2.85 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	2.00-2.85	1.469	35	0.43 (max)	0.42(average)	0.14 (average)	N/A



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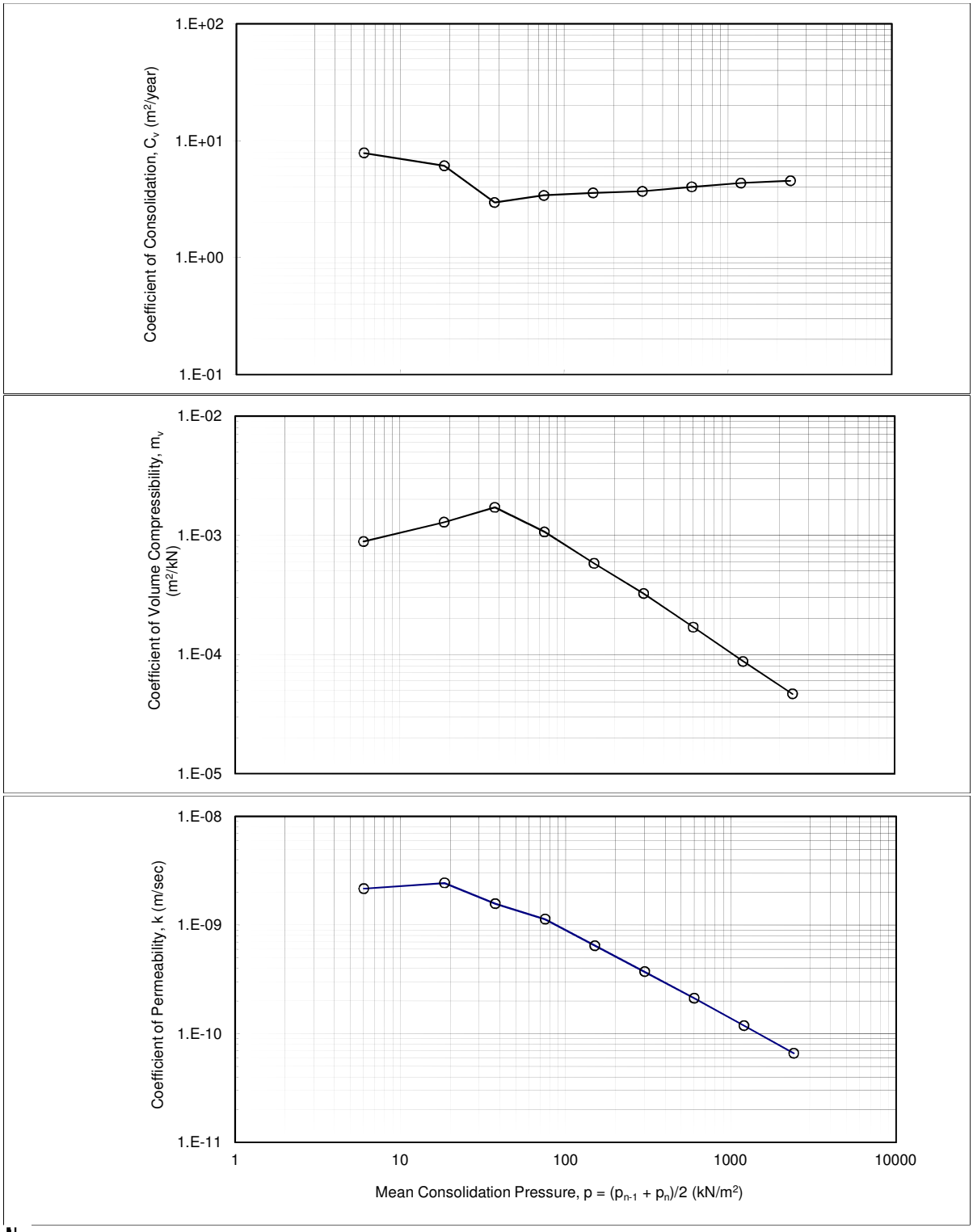
Consolidation Test (p - $\overline{cv}$, mv , k curves)

Project	:	Preparatory Survey on Matarbari USC Coal-fired Power Project		Borehole No. :	PP-24-1
Project No.	:	S27-14		Sample No. :	HP-1
Date of testing	:	20-Nov-14	Tested by : Lim	Depth of Sample :	2.00-2.85 m



KISO-JIBAN CONSULTANTS CO., LTD.

PROJECT NAME : Preparatory Survey on Matarbari USC Coal-fired Power Project
PROJECT NO. : S27-14
BOREHOLE NO. : PP-24-1
TESTING STANDARD : ASTM D2435-11
DATE : 20-Nov-14
SAMPLE NO. : HP-1
INITIAL HEIGHT OF SPECIMEN : 18.000 mm
NO. OF LOADING STEP : 9
DEPTH : 2.00-2.85 m
DIAMETER OF SPECIMEN : 53.900 mm
SPECIFIC GRAVITY : 2.75
TESTER NO. : 17
DRY WEIGHT OF SPECIMEN : 45.720 grams
SOLID HEIGHT OF SPECIMEN : 7.290 mm
INITIAL MOISTURE CONTENT : 51.2 %
BULK DENSITY : 1.72 Mg/m^3
METHOD OF TIME FITTING USED : SQUARE ROOT TIME CURVE - FITTING METHOD
LABORATORY TEMPERATURE : 23.0 ^{o}C

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				2.469	1.469
	12.000	19.0		17.905	1.06	8.84E-04		
12.000			17.810				2.443	1.443
	13.000	29.5		17.663	1.67	1.28E-03		
25.000			17.515				2.403	1.403
	25.000	73.3		17.149	4.27	1.71E-03		
50.000			16.782				2.302	1.302
	50.000	87.2		16.346	5.33	1.07E-03		
100.000			15.910				2.182	1.182
	100.000	89.8		15.461	5.81	5.81E-04		
200.000			15.012				2.059	1.059
	200.000	94.1		14.542	6.47	3.24E-04		
400.000			14.071				1.930	0.930
	400.000	92.2		13.610	6.77	1.69E-04		
800.000			13.149				1.804	0.804
	800.000	89.0		12.704	7.01	8.76E-05		
1600.000			12.259				1.682	0.682
	1600.000	88.3		11.818	7.47	4.67E-05		
3200.000			11.376				1.560	0.560

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	4.23	2.49E-07	2.15E-02	7.86E+00	8.7	0.459	2.16E-09
12.000								
	18.500	5.29	1.94E-07	1.67E-02	6.11E+00	15.0	0.508	2.44E-09
25.000								
	37.500	10.29	9.39E-08	8.11E-03	2.96E+00	49.0	0.668	1.57E-09
50.000								
	75.000	8.12	1.08E-07	9.34E-03	3.41E+00	55.4	0.635	1.13E-09
100.000								
	150.000	6.93	1.13E-07	9.79E-03	3.57E+00	57.3	0.638	6.46E-10
200.000								
	300.000	5.93	1.17E-07	1.01E-02	3.69E+00	58.4	0.621	3.72E-10
400.000								
	600.000	4.77	1.28E-07	1.10E-02	4.03E+00	55.6	0.603	2.12E-10
800.000								
	1200.000	3.85	1.38E-07	1.19E-02	4.34E+00	52.6	0.591	1.18E-10
1600.000								
	2400.000	3.19	1.44E-07	1.24E-02	4.54E+00	49.4	0.560	6.60E-11
3200.000								

REBOUND

P	800.000	200.000	50.000	12.000
H	11.636	12.096	12.656	13.369
E	0.596	0.659	0.736	0.834

KISO-JIBAN CONSULTANTS CO., LTD.

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CONSOLIDATION TEST (e-log p curves)

Preparatory Survey on Matarbari USC Coal-fired Power

Project : Project

Project No.: S27-14 Tested by : Lim

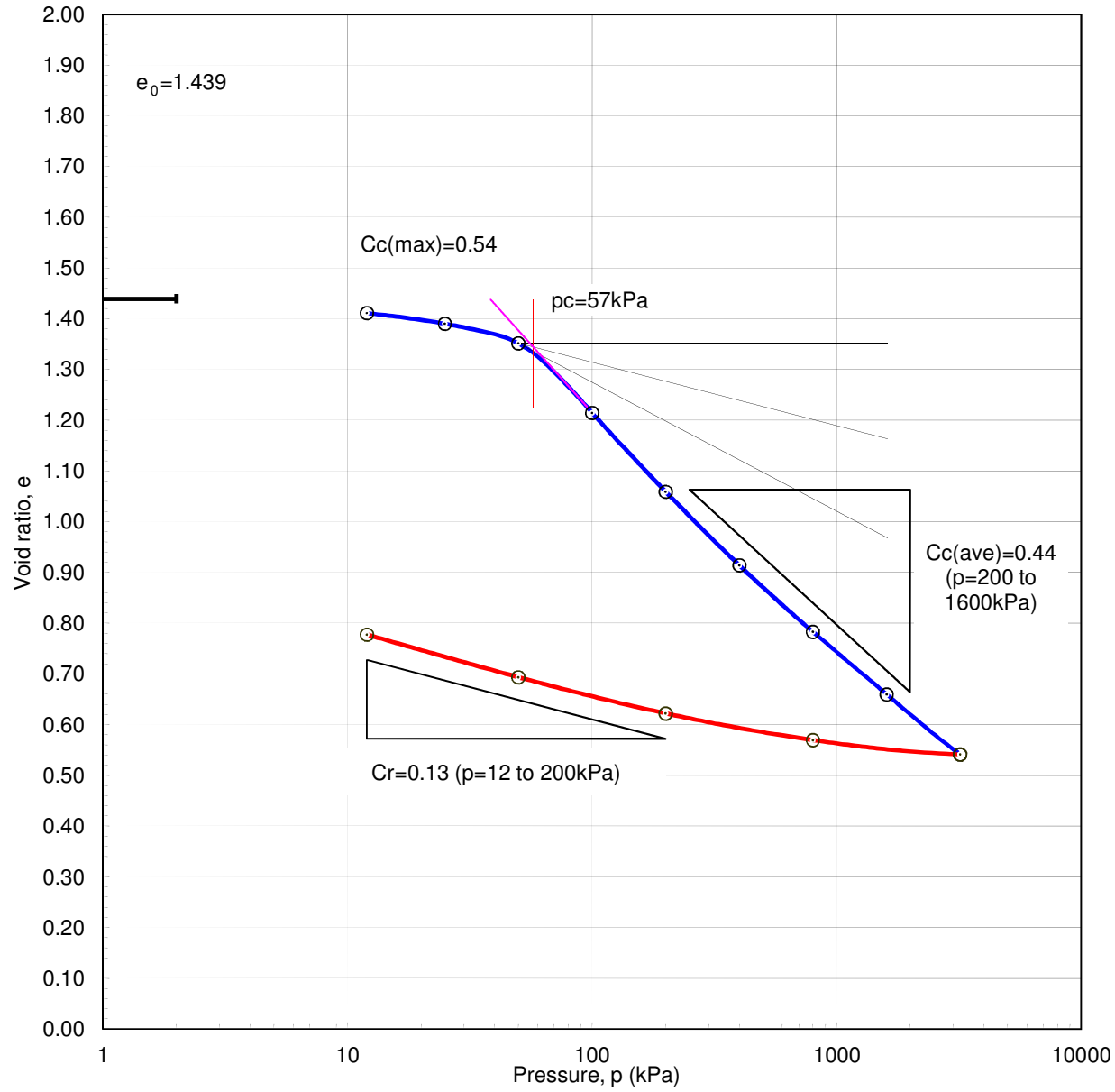
Soil Type : Clay Checked by : A. B. Tan

Borehole No. : PP-24-1

Sample No. : HP-2

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	1.439	57	0.54 (max)	0.44(average)	0.13 (average)	N/A



KISO-JIBAN CONSULTANTS CO., LTD.

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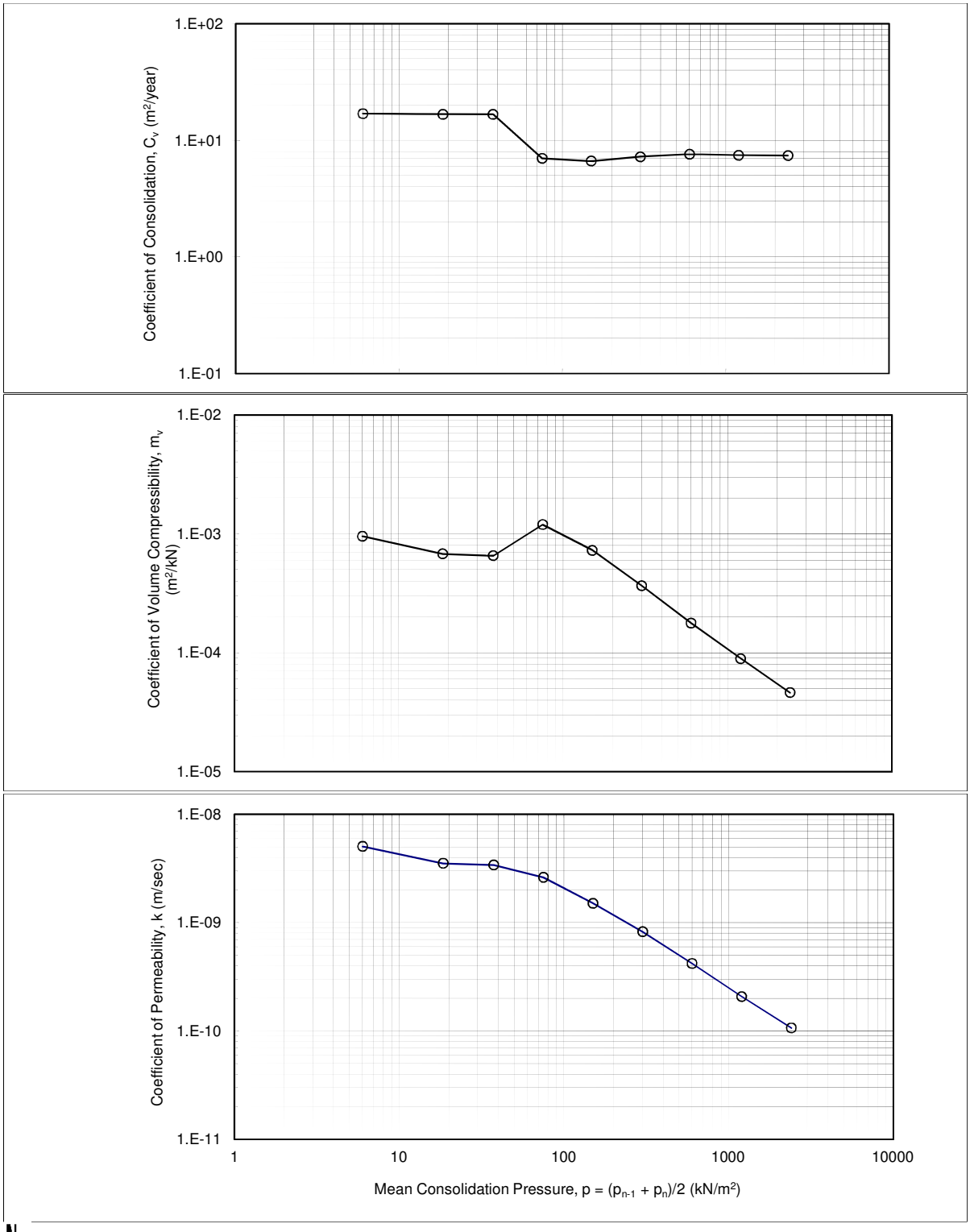
Consolidation Test (p - $\overline{cv}$, mv , k curves)

Project	:	Preparatory Survey on Matarbari USC Coal-fired Power Project		Borehole No.	: PP-24-1
Project No.	:	S27-14		Sample No.	: HP-2
Date of testing	:	17-Nov-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. : PP-24-1
TESTING STANDARD : ASTM D2435-11
DATE : 17-Nov-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 : 2.74
TESTER NO. : 28
DRY WEIGHT OF SPECIMEN : 46.130 grams
SOLID HEIGHT OF SPECIMEN : 7.380 mm
INITIAL MOISTURE CONTENT : 50.3 %
BULK DENSITY : 1.72 Mg/m^3
METHOD OF TIME FITTING USED : SQUARE ROOT TIME CURVE - FITTING METHOD
LABORATORY TEMPERATURE : 23.0 ^{o}C

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				2.439	1.439
	12.000	20.5		17.898	1.15	9.55E-04		
12.000			17.795				2.411	1.411
	13.000	15.6		17.717	0.88	6.77E-04		
25.000			17.639				2.390	1.390
	25.000	28.6		17.496	1.63	6.54E-04		
50.000			17.353				2.351	1.351
	50.000	100.9		16.849	5.99	1.20E-03		
100.000			16.344				2.215	1.215
	100.000	114.7		15.771	7.27	7.27E-04		
200.000			15.197				2.059	1.059
	200.000	107.2		14.661	7.31	3.66E-04		
400.000			14.125				1.914	0.914
	400.000	96.7		13.642	7.09	1.77E-04		
800.000			13.158				1.783	0.783
	800.000	90.7		12.705	7.14	8.92E-05		
1600.000			12.251				1.660	0.660
	1600.000	87.4		11.814	7.40	4.62E-05		
3200.000			11.377				1.542	0.542

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	1.96	5.38E-07	4.65E-02	1.70E+01	7.6	0.371	5.04E-09
12.000								
	18.500	1.95	5.30E-07	4.58E-02	1.67E+01	6.7	0.430	3.52E-09
25.000								
	37.500	1.90	5.30E-07	4.58E-02	1.67E+01	11.6	0.405	3.40E-09
50.000								
	75.000	4.19	2.23E-07	1.92E-02	7.02E+00	49.1	0.487	2.61E-09
100.000								
	150.000	3.88	2.11E-07	1.82E-02	6.64E+00	66.2	0.577	1.50E-09
200.000								
	300.000	3.07	2.30E-07	1.99E-02	7.25E+00	57.7	0.538	8.24E-10
400.000								
	600.000	2.53	2.41E-07	2.09E-02	7.61E+00	51.3	0.530	4.20E-10
800.000								
	1200.000	2.24	2.36E-07	2.04E-02	7.45E+00	48.3	0.532	2.07E-10
1600.000								
	2400.000	1.95	2.35E-07	2.03E-02	7.41E+00	44.2	0.506	1.07E-10
3200.000								

REBOUND

P	800.000	200.000	50.000	12.000
H	11.585	11.973	12.499	13.120
E	0.570	0.622	0.694	0.778

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 : Perera		Checked by : A. B. Tan			
Borehole No.: PP-24-1		Sample No.:D-2		Depth :11.00-11.60m			
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	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	350	450	550		
	B-value		0.96	0.95	0.95		
Consolidation Stage	Cell Pressure	kPa	350	450	550		
	Back Pressure	kPa	200	200	200		
	Initial PWP,	kPa	326	414	504		
	Final PWP	kPa	200	200	200		
Consolidation Parameter	Volume Change,	%	0.82	1.76	1.13		
	Coefficient of Consolidation Cv,	m^2/year	51.33	29.21	56.80		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.05	0.07	0.03		
Compression Stage	Cell Pressure	kPa	350	450	550		
	Back Pressure	kPa	200	200	200		
	Effective Cell Pressure	kPa	150	250	350		
	Shearing Speed	mm/min	0.015	0.015	0.015		
Failure Conditions	Peak Deviator Stress $(\sigma_1-\sigma_3)f$,	kPa	400	589	898		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	N/A	N/A	N/A		
	Volumetric Strain at $(\sigma_1-\sigma_3)f$	(%)	1.66	0.96	2.14		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	15.00	9.86	14.46		
Shear Strength Parameters	In terms of Effective Stress $\phi' = 34$ deg $c' = 0$ kPa		Mode of Failure 1 2 3 4				
Remarks : Specimens are prepared at required saturated wet density = 1.90 Mg/m3							

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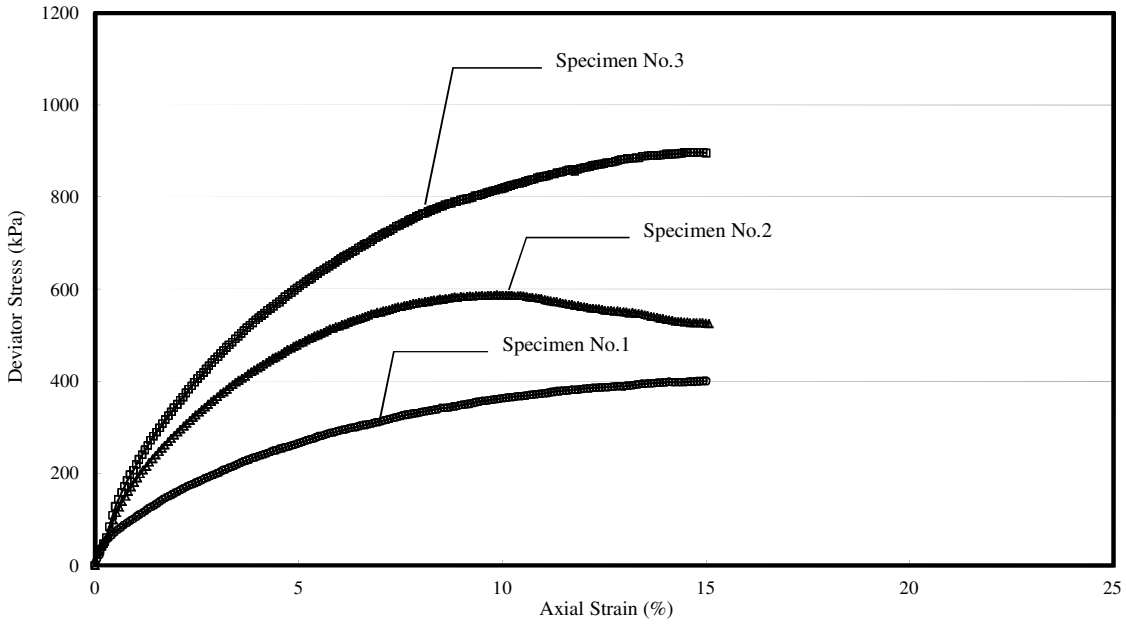
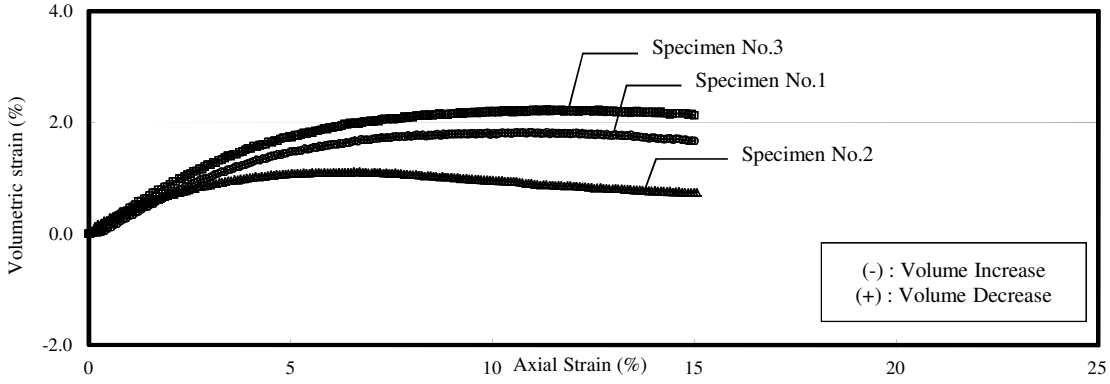
Consolidated Drained Triaxial Compression Test

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-2 Soil Type: Clayey Sand
Borehole No.: PP-24-1 Depth : 11.00-11.60m





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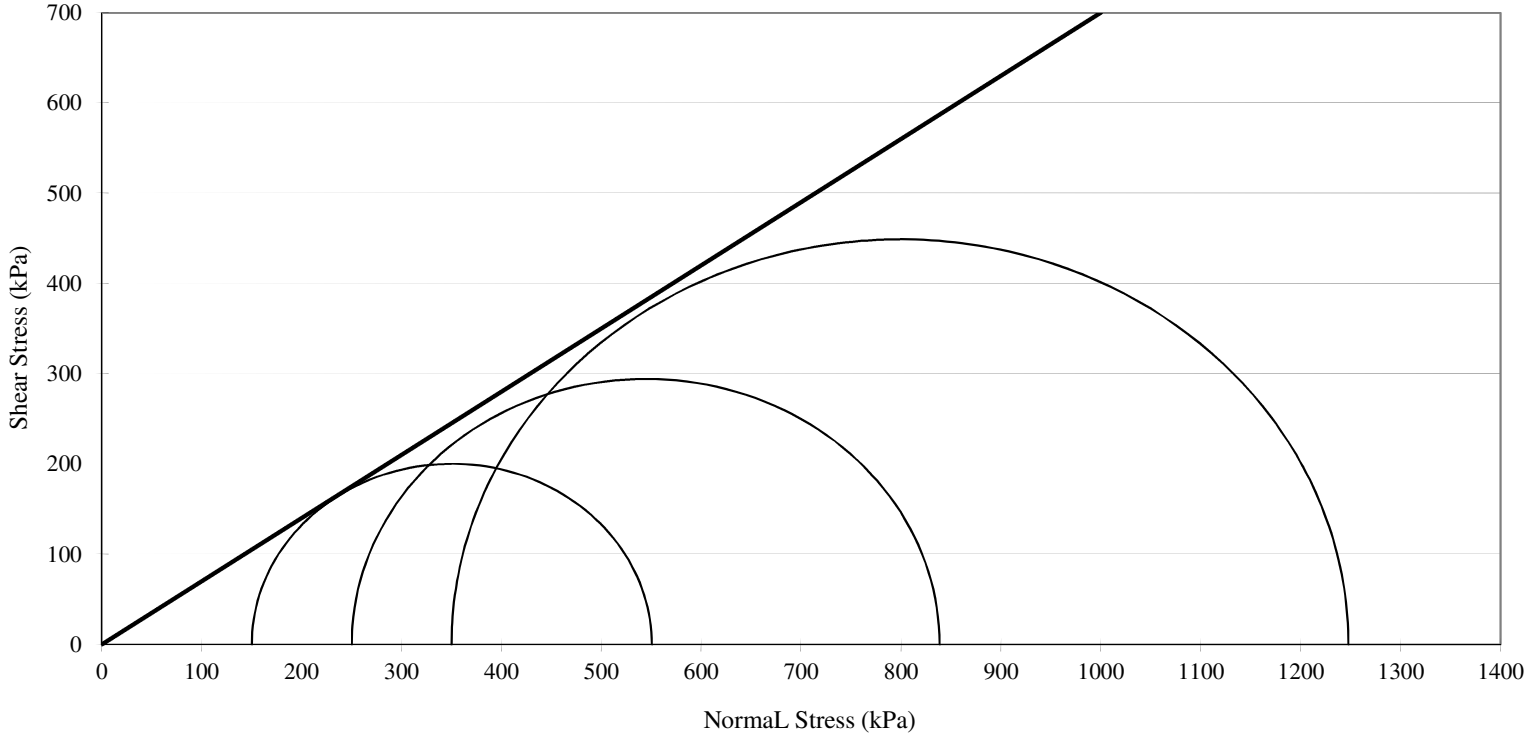
Consolidated Drained Triaxial Compression Test

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

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14

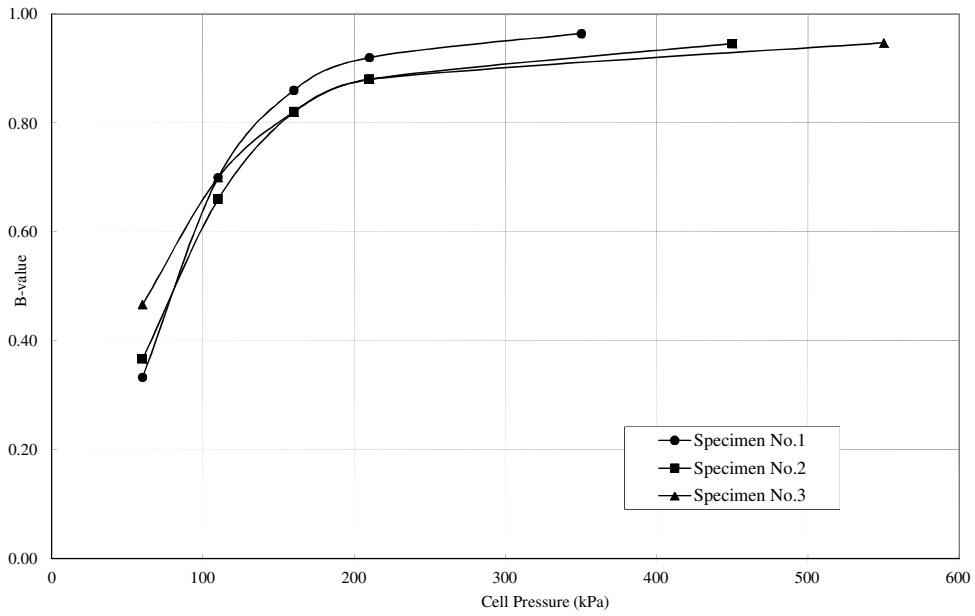
Borehole No. : PP-24-1 Soil Type: Clayey Sand
Sample No. : D-2 Depth : 11.00-11.60m
Angle of Internal Friction, ϕ 35 deg
Cohesion, c 0 kPa



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.: PP-24-1 Depth : 11.00-11.60m
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	30	20	31	20	34
	Back Pressure (kPa)	20		20		20	
	B-value	0.33		0.37		0.47	
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110
	P.W.P (kPa)	50	85	50	83	50	85
	Back Pressure (kPa)	50		50		50	
	B-value	0.70		0.66		0.70	
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160
	P.W.P (kPa)	100	143	100	141	100	141
	Back Pressure (kPa)	100		100		100	
	B-value	0.86		0.82		0.82	
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210
	P.W.P (kPa)	150	196	150	194	150	194
	Back Pressure (kPa)	150		150		150	
	B-value	0.92		0.88		0.88	
B-check Step.5	Cell Pressure (kPa)	210	350	210	450	210	550
	P.W.P (kPa)	200	335	200	427	200	522
	Back Pressure (kPa)	200		200		200	
	B-value	0.96		0.95		0.95	



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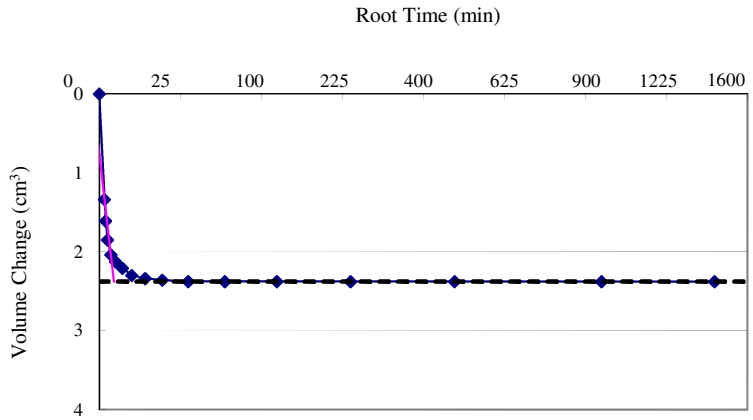
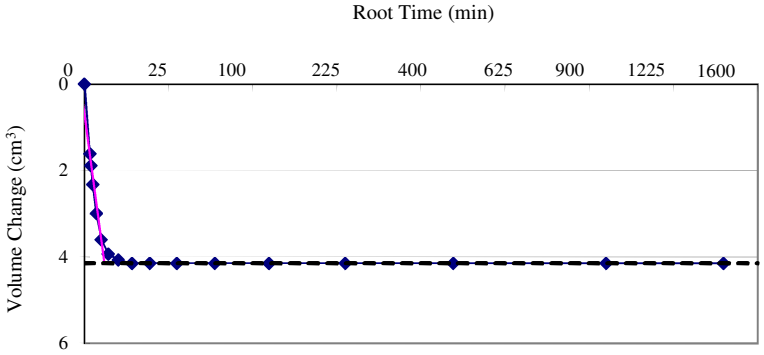
Consolidated Drained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages -

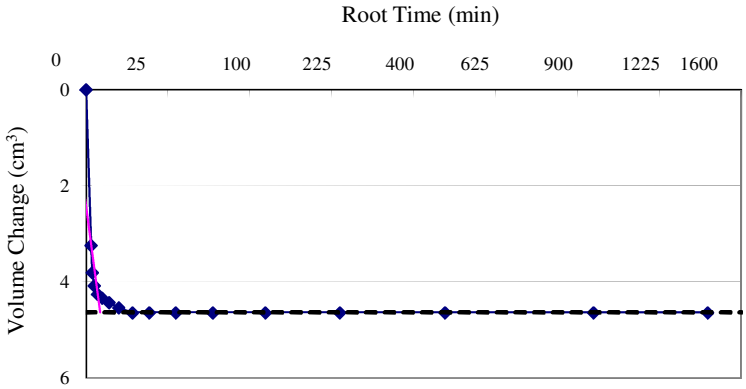
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: D-2 Soil Type: Clayey Sand
Borehole No.: PP-24-1 Depth : 11.00-11.60m



Specimen No.: 1
p' = 150 kPa
t100 = 0.8 min
Cv = 51.33 m^2/year
mvi= 0.05 m^2/MN



Specimen No.: 2
p' = 250 kPa
t100 = 1.4 min
Cv = 29.21 m^2/year
mvi= 0.07 m^2/MN



Specimen No.: 3
p' = 350 kPa
t100 = 0.7 min
Cv = 56.80 m^2/year
mvi= 0.03 m^2/MN

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34) PP3-15-1

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TABLE SUMMARY OF SOIL TEST

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

Borehole No.		PP3-15-1									
Sample No.		HP-1	HP-2								
Sample Depth		1.00m ~1.75m	4.00m ~4.75m								
Condition of Sample		Undisturbed									
Natural Water Content	%	41.6	36.8								
Specific Gravity		2.73	2.74								
Wet Density	Mg/m^3	1.78	1.81								
Dry Density	Mg/m^3	1.26	1.33								
Natural Void Ratio		1.17	1.07								
Degree of Saturation	%	97	95								
Atterberg Limits	Liquid Limit, %	46	41								
	Plastic Limit, %	23	21								
	Plasticity Index, %	23	20								
Grain Size Analysis	Gravel, %	0	0								
	Sand, %	6	15								
	Silt, %	44	42								
	Clay & Colloid, %	50	43								
	Max. diameter, mm	2.00	2.00								
	Diam. at 60% mm	0.0085	0.013								
	Diam. at 10% mm	-	-								
Visual soil description		Clay	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})	-	-								
	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

Checked by : A. B. Tan

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ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project Project No. : S27-14

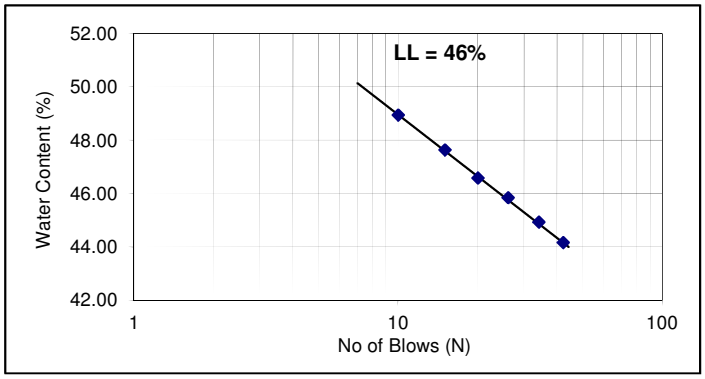
Standard : ASTM D4318-10 Date of Testing : 10.12.14

Tested By : Vasantha Checked By : A. B. Tan

Sample No. : PP3-15-1 HP-1 Depth : 1.00-1.75m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	42	44.17
2	34	44.93
3	26	45.85
4	20	46.58
5	15	47.63
6	10	48.94
Liquid Limits %		**46**
Plastic Limits %		**23**
Plasticity Index		**23**

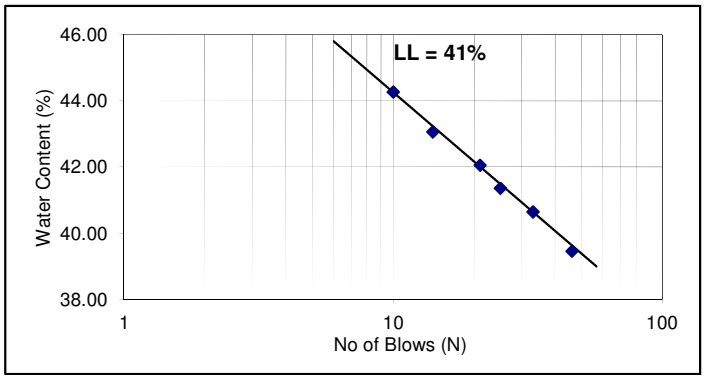


Sample No. : PP3-15-1 HP-2 Depth : 4.00-4.75m

Remarks : Tested on material at natural state

%

Liquid Limits Test		
Test No.	Blows	Wn
1	46	39.46
2	33	40.64
3	25	41.35
4	21	42.06
5	14	43.06
6	10	44.26
Liquid Limits %		**41**
Plastic Limits %		**21**
Plasticity Index		**20**



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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 : **05.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

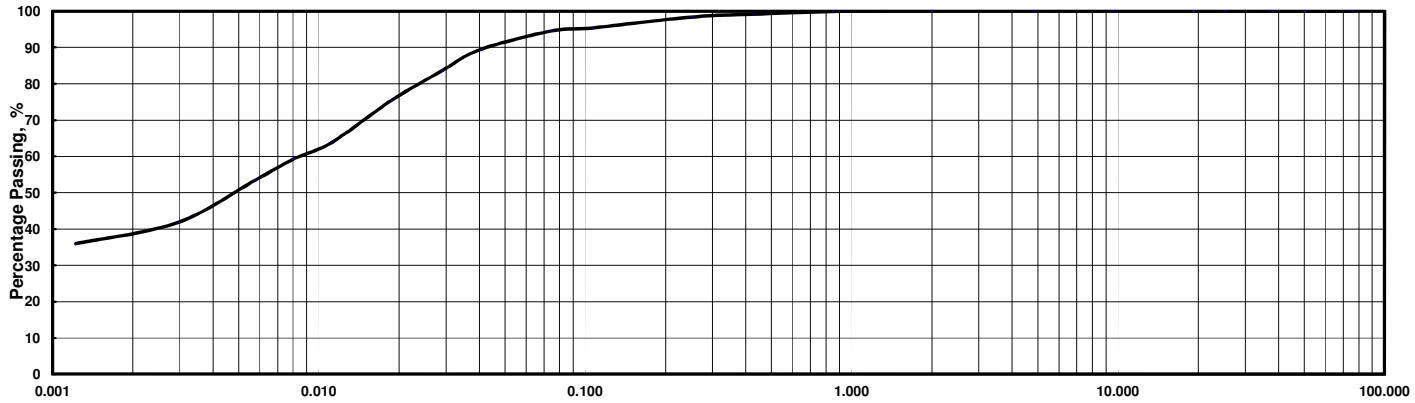
Sample No. : **PP3-15-1 HP-1** Depth : **1.00-1.75m** ( ) Specific Gravity : 2.73

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	99.9	99.1	98.3	95.4	94.6
Hydro.	Dia., mm	0.040	0.029	0.019	0.011	0.0080	0.0057	0.0030	0.0012							
	% Passing	89.4	83.6	75.5	63.8	59.2	53.4	41.8	36.0							

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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. Depth	PP3-15-1 HP-1 1.00-1.75m		Sample No. Depth	PP3-15-1 HP-1 1.00-1.75m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.0085 mm	
2.00 - 0.425 mm	0.9 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	4.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	44.2 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	50.3 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.9 %				
75um Sieve Passing	94.6 %				

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 : **05.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

Sample No. : **PP3-15-1 HP-2** Depth : **4.00-4.75m** ( ) 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	99.8	99.2	96.2	87.6	84.7
Hydro.	Dia., mm	0.039	0.028	0.018	0.011	0.0079	0.0057	0.0029	0.0012							
	% Passing	78.7	73.9	67.1	56.8	50.8	45.1	36.4	28.8							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-15-1 HP-2 4.00-4.75m		Sample No. Depth	PP3-15-1 HP-2 4.00-4.75m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.013 mm	
2.00 - 0.425 mm	0.8 %		Dia. at 30%	0.0014 mm	
0.425 - 0.075 mm	14.5 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	41.7 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	42.9 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.8 %				
75um Sieve Passing	84.7 %				

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35) PP3-15-2

TABLE SUMMARY OF SOIL TEST

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

Borehole No.			PP3-15-2								
Sample No.			HP-1	HP-2	HP-3	HP-4	HP-5	HP-6			
Sample Depth			1.00m ~1.50m	2.00m ~2.85m	5.00m ~5.90m	8.00m ~8.90m	11.00m ~11.90m	14.00m ~14.90m			
Condition of Sample			Undisturbed								
Natural Water Content		%	39.5	66.1	47.6	38.5	30.2	29.3			
Specific Gravity			2.76	2.70	2.74	2.74	2.72	2.72			
Wet Density		Mg/m^3	1.82	1.56	1.72	1.83	1.87	1.87			
Dry Density		Mg/m^3	1.30	0.94	1.16	1.32	1.44	1.45			
Natural Void Ratio			1.12	1.87	1.36	1.08	0.89	0.88			
Degree of Saturation		%	98	95	96	98	92	91			
Atterberg Limits	Liquid Limit,	%	56	79	50	39	29	28			
	Plastic Limit,	%	27	37	27	22	19	16			
	Plasticity Index,	%	29	42	23	17	10	12			
Grain Size Analysis	Gravel,	%	0	0	0	0	0	0			
	Sand,	%	2	8	13	14	40	40			
	Silt,	%	38	36	37	44	32	25			
	Clay & Colloid,	%	60	56	50	42	28	35			
	Max. diameter,	mm	0.850	2.00	0.850	0.850	0.425	0.85			
	Diam. at 60%	mm	0.0049	0.0059	0.0083	0.017	0.074	0.076			
	Diam. at 10%	mm	-	-	-	-	-	-			
Visual soil description			Clay	Silt	Clay with Sand	Clay with Sand	Sandy Clay	Sandy Clay			
Unified soil classification			CH	MH	CH	CL	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

Checked by : A. B. Tan

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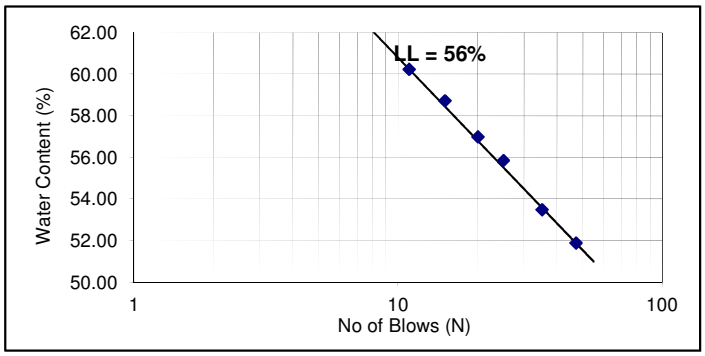
ATTERBERG LIMITS DETERMINATION

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

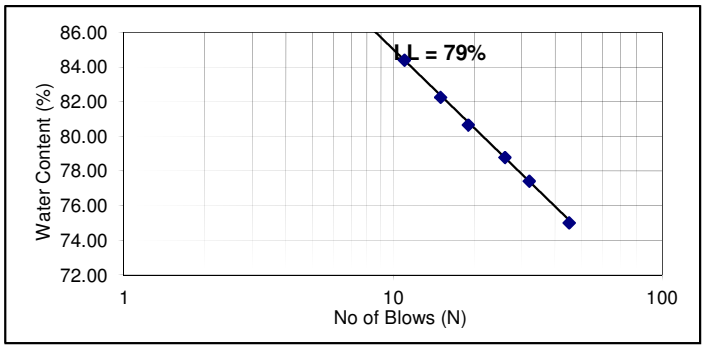
Sample No. : PP3-15-2 HP-1
Depth : 1.00-1.50m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	47	51.90
2	35	53.49
3	25	55.85
4	20	56.99
5	15	58.72
6	11	60.24
Liquid Limits %		**56**
Plastic Limits %		**27**
Plasticity Index		**29**



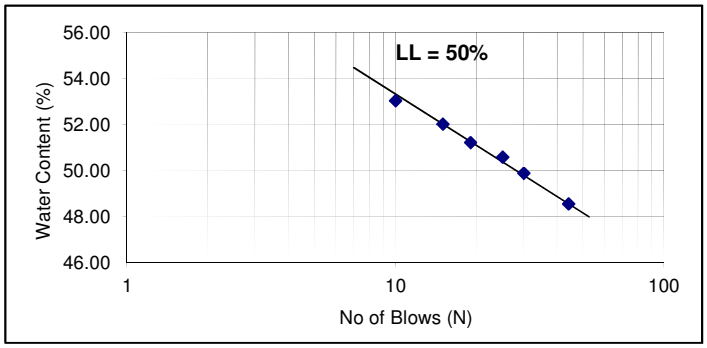
Sample No. : PP3-15-2 HP-2
Depth : 2.00-2.85m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	45	75.00
2	32	77.41
3	26	78.77
4	19	80.64
5	15	82.23
6	11	84.40
Liquid Limits %		**79**
Plastic Limits %		**37**
Plasticity Index		**42**



Sample No. : PP3-15-2 HP-3
Depth : 5.00-5.90m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	44	48.56
2	30	49.89
3	25	50.59
4	19	51.23
5	15	52.03
6	10	53.04
Liquid Limits %		**50**
Plastic Limits %		**27**
Plasticity Index		**23**



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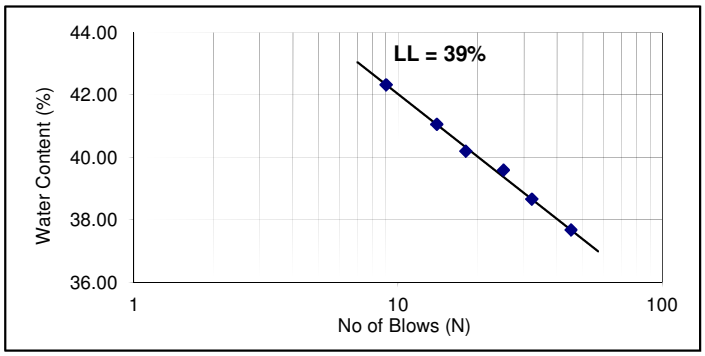
ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14
Standard : ASTM D4318-10
Date of Testing : 10.12.14
Tested By : Vasantha
Checked By : A. B. Tan

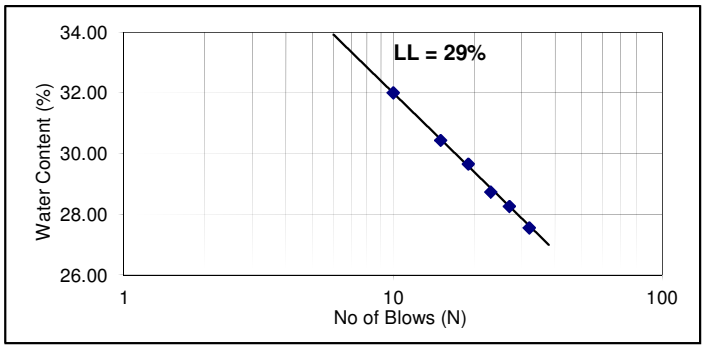
Sample No. : PP3-15-2 HP-4
Depth : 8.00-8.90m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	45	37.68
2	32	38.67
3	25	39.59
4	18	40.20
5	14	41.06
6	9	42.33
Liquid Limits %		**39**
Plastic Limits %		**22**
Plasticity Index		**17**



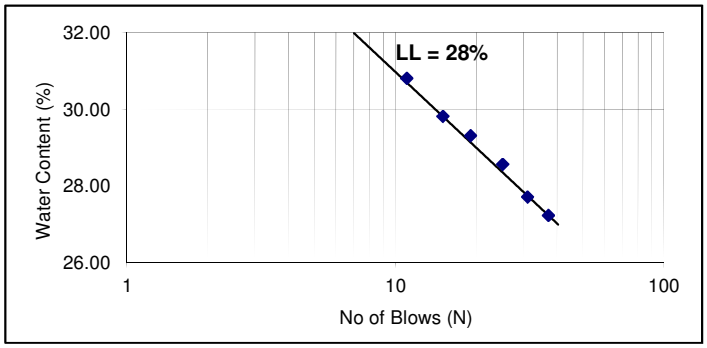
Sample No. : PP3-15-2 HP-5
Depth : 11.00-11.90m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	32	27.56
2	27	28.26
3	23	28.73
4	19	29.65
5	15	30.43
6	10	32.00
Liquid Limits %		**29**
Plastic Limits %		**19**
Plasticity Index		**10**



Sample No. : PP3-15-2 HP-6
Depth : 14.00-14.90m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	37	27.24
2	31	27.72
3	25	28.57
4	19	29.31
5	15	29.81
6	11	30.80
Liquid Limits %		**28**
Plastic Limits %		**16**
Plasticity Index		**12**



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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 : **05.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

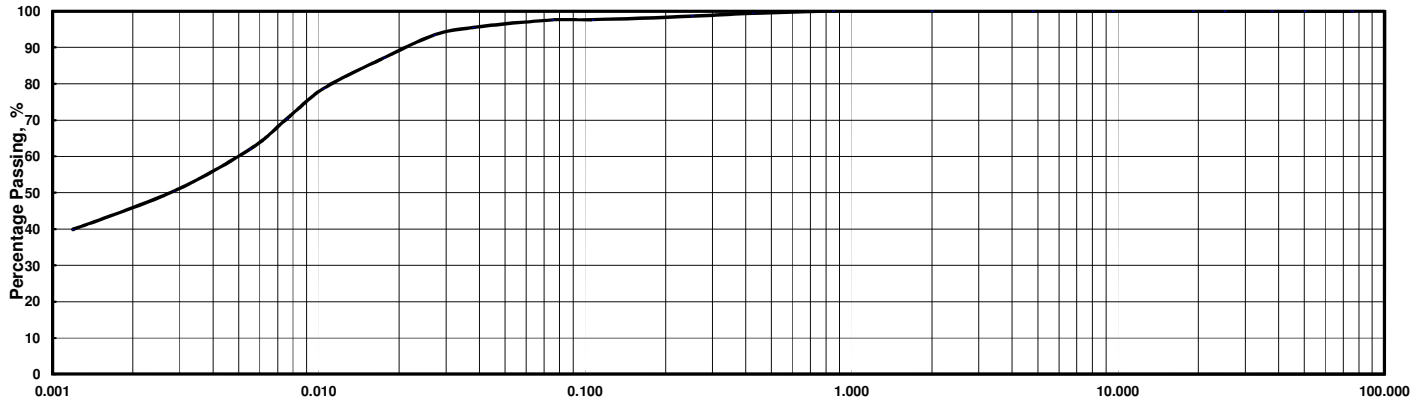
Sample No. : **PP3-15-2 HP-1** Depth : **1.00-1.50m** ( ) Specific Gravity : 2.76

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	98.6	97.6	97.6
Hydro.	Dia., mm	0.038	0.027	0.018	0.010	0.0076	0.0055	0.0028	0.0012							
	% Passing	95.5	93.4	87.1	78.7	70.3	61.9	50.4	39.9							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-15-2 HP-1 1.00-1.50m			Sample No. Depth	PP3-15-2 HP-1 1.00-1.50m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.0049	mm
2.00 - 0.425 mm	0.6	%		Dia. at 30%	-	mm
0.425 - 0.075 mm	1.8	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	37.8	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	59.8	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	97.6	%				

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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 : **05.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

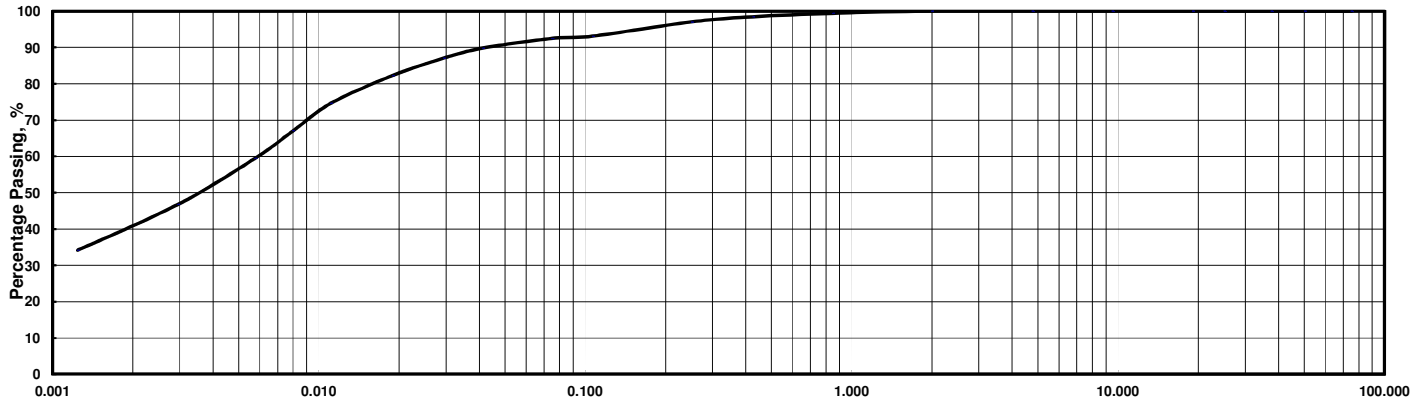
Sample No. : **PP3-15-2 HP-2** Depth : **2.00-2.85m** ( ) Specific Gravity : 2.70

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	98.4	97.0	93.1	92.5
Hydro.	Dia., mm	0.041	0.029	0.019	0.011	0.0080	0.0058	0.0030	0.0012							
	% Passing	89.8	87.0	82.2	74.6	67.1	59.5	46.8	34.2							

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	PP3-15-2 HP-2 2.00-2.85m		Sample No. Depth	PP3-15-2 HP-2 2.00-2.85m	
Larger than 4.75 mm	0.0 %		Max. Diameter	2.00 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.0059 mm	
2.00 - 0.425 mm	1.6 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	6.0 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	36.4 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	56.1 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.4 %				
75um Sieve Passing	92.5 %				

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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 : **05.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

Sample No. : **PP3-15-2 HP-3** Depth : **5.00-5.90m** ( ) 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	99.3	98.7	90.5	86.7
Hydro.	Dia., mm	0.040	0.028	0.018	0.011	0.0078	0.0056	0.0029	0.0012							
	% Passing	81.4	77.8	73.5	64.8	59.0	52.8	41.4	32.1							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-15-2 HP-3 5.00-5.90m		Sample No. Depth	PP3-15-2 HP-3 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%	0.0083 mm	
2.00 - 0.425 mm	0.7 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	12.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	36.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	50.2 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	86.7 %				

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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 : **06.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

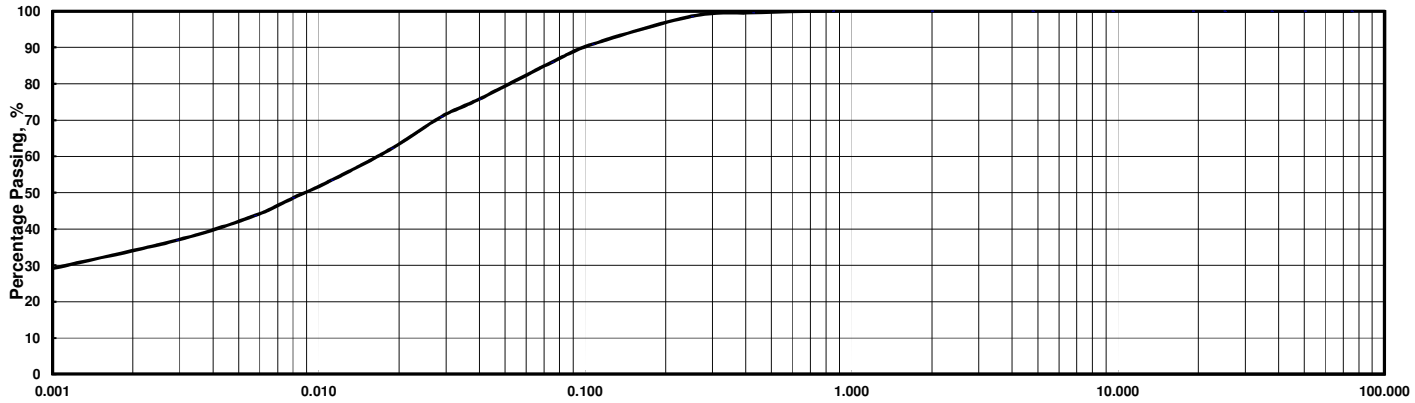
Sample No. : **PP3-15-2 HP-4** Depth : **8.00-8.90m** ( ) Specific Gravity : 2.74

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	99.5	98.6	90.9	86.0
Hydro.	Dia., mm	0.040	0.029	0.019	0.011	0.0080	0.0057	0.0029	0.0009							
	% Passing	75.8	70.9	62.2	53.4	48.6	43.7	36.9	28.2							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-15-2 HP-4 8.00-8.90m		Sample No. Depth	PP3-15-2 HP-4 8.00-8.90m	
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	0.5 %		Dia. at 30%	0.0011 mm	
0.425 - 0.075 mm	13.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	44.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	41.9 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	86.0 %				

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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 : **06.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

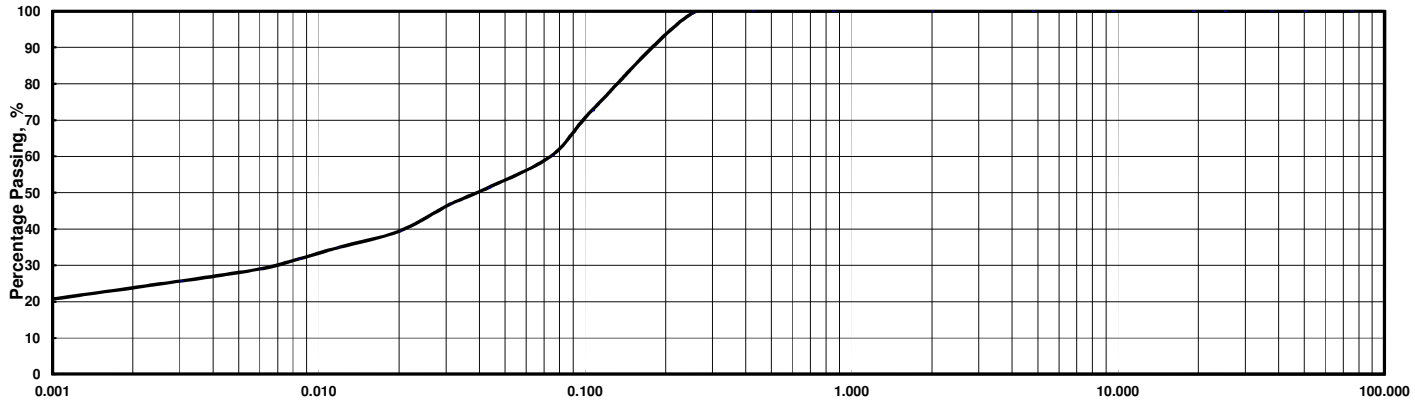
Sample No. : **PP3-15-2 HP-5** Depth : **11.00-11.90m** ( ) Specific Gravity : 2.72

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	99.3	72.7	60.3
Hydro.	Dia., mm	0.043	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0009							
	% Passing	51.4	46.8	39.4	34.9	31.7	29.0	25.7	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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-15-2 HP-5 11.00-11.80m		Sample No. Depth	PP3-15-2 HP-5 11.00-11.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.074 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.0068 mm	
0.425 - 0.075 mm	39.7 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	32.4 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	27.9 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	60.3 %				

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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 : **06.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

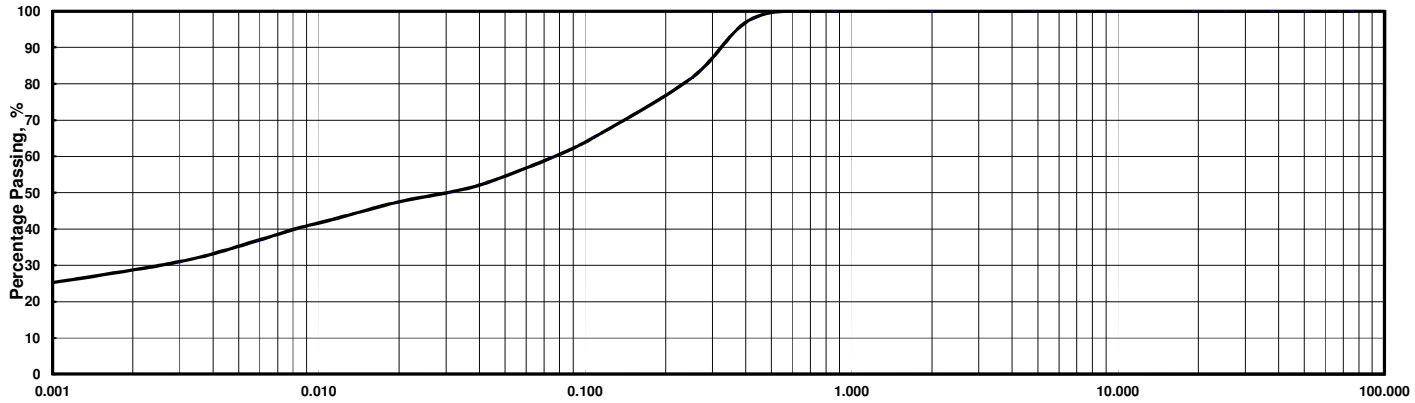
Sample No. : **PP3-15-2 HP-6** Depth : **14.00-14.90m** ( ) Specific Gravity : 2.72

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	98.0	81.6	65.0	59.7
Hydro.	Dia., mm	0.043	0.031	0.020	0.011	0.0082	0.0058	0.0030	0.0009							
	% Passing	52.8	50.1	47.4	42.8	40.1	36.8	31.0	24.6							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-15-2 HP-6 14.00-14.60m		Sample No. Depth	PP3-15-2 HP-6 14.00-14.60m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.85 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.076 mm	
2.00 - 0.425 mm	2.0 %		Dia. at 30%	0.0025 mm	
0.425 - 0.075 mm	38.3 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	24.6 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	35.1 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	59.7 %				

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36) PP3-17-1

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TABLE SUMMARY OF SOIL TEST

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

Borehole No.		PP3-17-1									
Sample No.		HP-1	HP-2	HP-3	HP-4						
Sample Depth		1.00m ~1.80m	4.00m ~4.77m	7.00m ~7.24m	7.50m ~8.40m						
Condition of Sample		Undisturbed									
Natural Water Content	%	50.6	37.7	38.5	37.0						
Specific Gravity		2.70	2.74	2.73	2.73						
Wet Density	Mg/m^3	1.63	1.87	-	1.82						
Dry Density	Mg/m^3	1.08	1.36	-	1.33						
Natural Void Ratio		1.50	1.02	-	1.06						
Degree of Saturation	%	91	100	-	96						
Atterberg Limits	Liquid Limit, %	62	39	40	42						
	Plastic Limit, %	31	22	22	23						
	Plasticity Index, %	31	17	18	19						
Grain Size Analysis	Gravel, %	0	0	0	0						
	Sand, %	4	9	11	6						
	Silt, %	41	48	46	48						
	Clay & Colloid, %	55	43	43	46						
	Max. diameter, mm	0.850	0.425	2.00	0.850						
	Diam. at 60% mm	0.0067	0.014	0.013	0.012						
	Diam. at 10% mm	-	-	-	-						
Visual soil description		Clay	Clay	Clay	Clay						
Unified soil classification		CH	CL	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

Checked by : A. B. Tan

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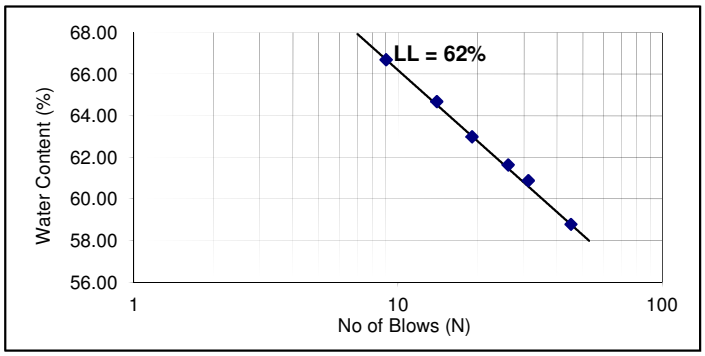
ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14
Standard : ASTM D4318-10
Date of Testing : 09.12.14
Tested By : Vasantha
Checked By : A. B. Tan

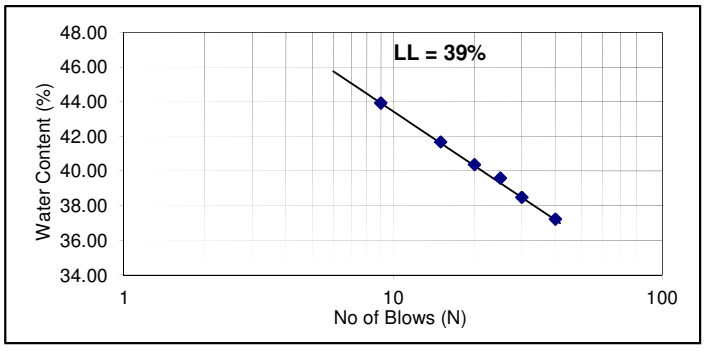
Sample No. : PP3-17-1 HP-1
Depth : 1.00-1.80m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	45	58.79
2	31	60.89
3	26	61.65
4	19	62.99
5	14	64.68
6	9	66.71
Liquid Limits %		**62**
Plastic Limits %		**31**
Plasticity Index		**31**



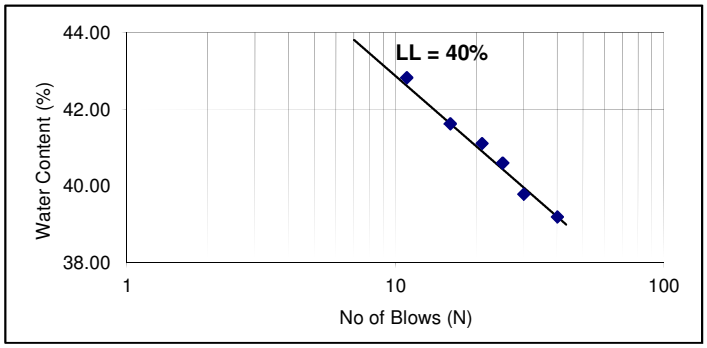
Sample No. : PP3-17-1 HP-2
Depth : 4.00-4.77m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	40	37.23
2	30	38.48
3	25	39.60
4	20	40.36
5	15	41.67
6	9	43.91
Liquid Limits %		**39**
Plastic Limits %		**22**
Plasticity Index		**17**



Sample No. : PP3-17-1 HP-3
Depth : 7.00-7.24m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	40	39.20
2	30	39.79
3	25	40.60
4	21	41.11
5	16	41.62
6	11	42.82
Liquid Limits %		**40**
Plastic Limits %		**22**
Plasticity Index		**18**



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ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project Project No. : S27-14

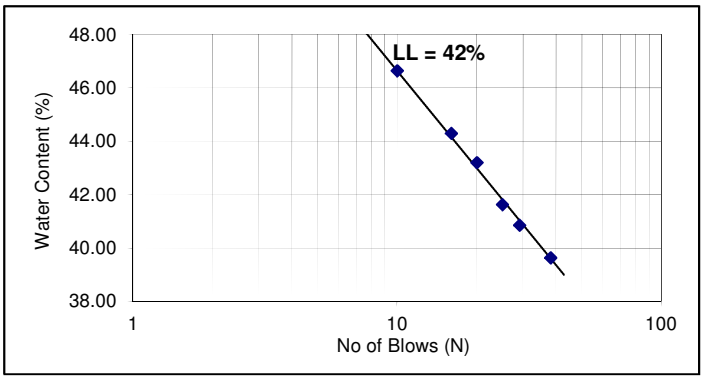
Standard : ASTM D4318-10 Date of Testing : 09.12.14

Tested By : Vasantha Checked By : A. B. Tan

Sample No. : PP3-17-1 HP-4 Depth : 7.50-8.40m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	38	39.62
2	29	40.85
3	25	41.61
4	20	43.19
5	16	44.29
6	10	46.63
Liquid Limits %		**42**
Plastic Limits %		**23**
Plasticity Index		**19**



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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 : **06.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

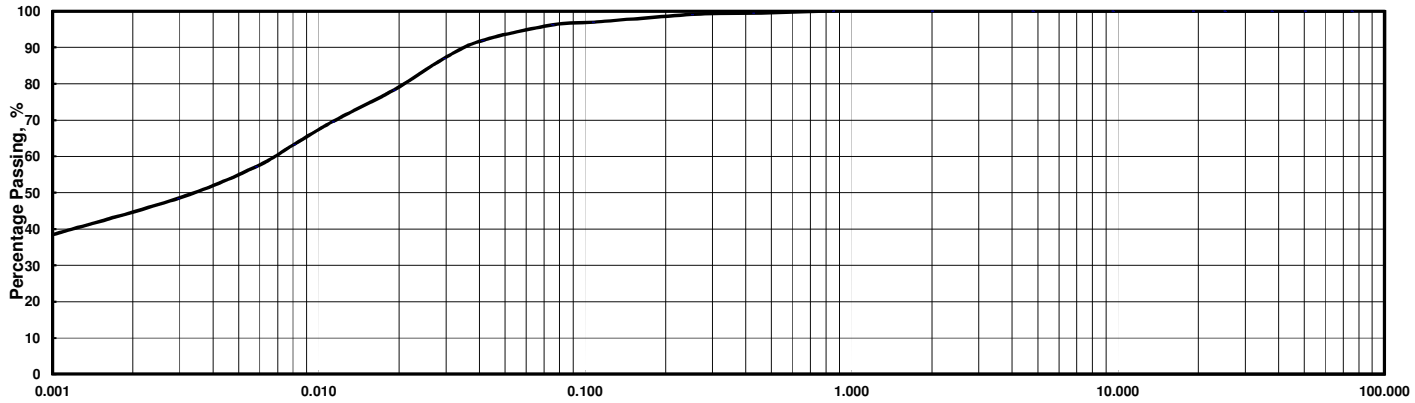
Sample No. : **PP3-17-1 HP-1** Depth : **1.00-1.80m** ( ) Specific Gravity : 2.70

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	99.4	99.1	96.9	96.2
Hydro.	Dia., mm	0.041	0.029	0.019	0.011	0.0081	0.0058	0.0030	0.0009							
	% Passing	91.9	86.9	78.2	69.6	63.3	57.1	48.4	37.3							

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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. Depth	PP3-17-1 HP-1 1.00-1.80m		Sample No. Depth	PP3-17-1 HP-1 1.00-1.80m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.0067 mm	
2.00 - 0.425 mm	0.6 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	3.2 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	41.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	54.7 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	96.2 %				

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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 : **06.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

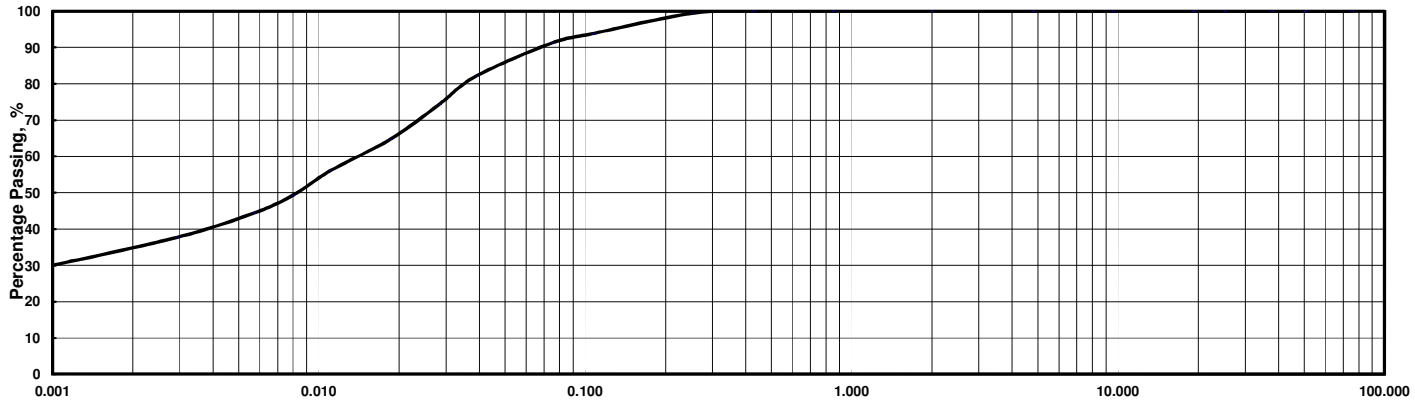
Sample No. : **PP3-17-1 HP-2** Depth : **4.00-4.77m** ( ) Specific Gravity : 2.74

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	100.0	99.4	93.8	91.2
Hydro.	Dia., mm	0.039	0.028	0.019	0.011	0.0080	0.0057	0.0029	0.0009							
	% Passing	82.1	74.4	64.7	56.0	49.3	44.4	37.7	29.0							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-17-1 HP-2 4.00-4.77m		Sample No. Depth	PP3-17-1 HP-2 4.00-4.77m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.014 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.0010 mm	
0.425 - 0.075 mm	8.8 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	48.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	42.7 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	91.2 %				

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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 : **06.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

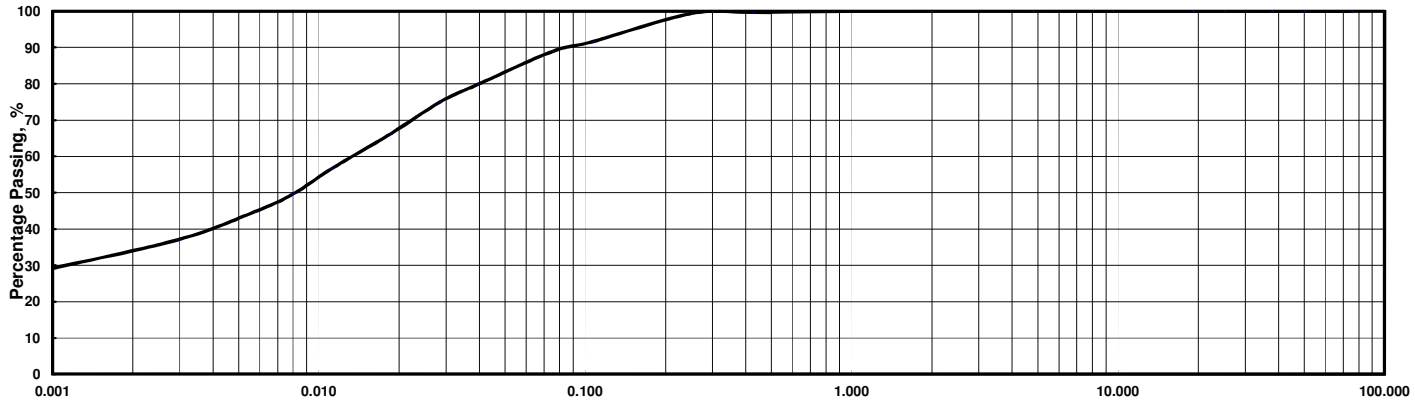
Sample No. : **PP3-17-1 HP-3** Depth : **7.00-7.24m** ( ) Specific Gravity : 2.73

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	99.9	99.6	99.3	91.6	88.9
Hydro.	Dia., mm	0.040	0.028	0.019	0.011	0.0080	0.0057	0.0029	0.0009							
	% Passing	79.8	75.0	66.2	56.5	49.6	44.8	37.0	28.2							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-17-1 HP-3 7.00-7.24m		Sample No. Depth	PP3-17-1 HP-3 7.00-7.24m	
Larger than 4.75 mm	0.0	%	Max. Diameter	2.00	mm
4.75 - 2.00 mm	0.0	%	Dia. at 60%	0.013	mm
2.00 - 0.425 mm	0.4	%	Dia. at 30%	0.0011	mm
0.425 - 0.075 mm	10.7	%	Dia. at 10%	-	mm
0.075 - 0.005 mm	46.1	%	Coeff. of Uniformity	-	
Smaller than 0.005 mm	42.7	%	Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%			
425um Sieve Passing	99.9	%			
75um Sieve Passing	88.9	%			

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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 : **06.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

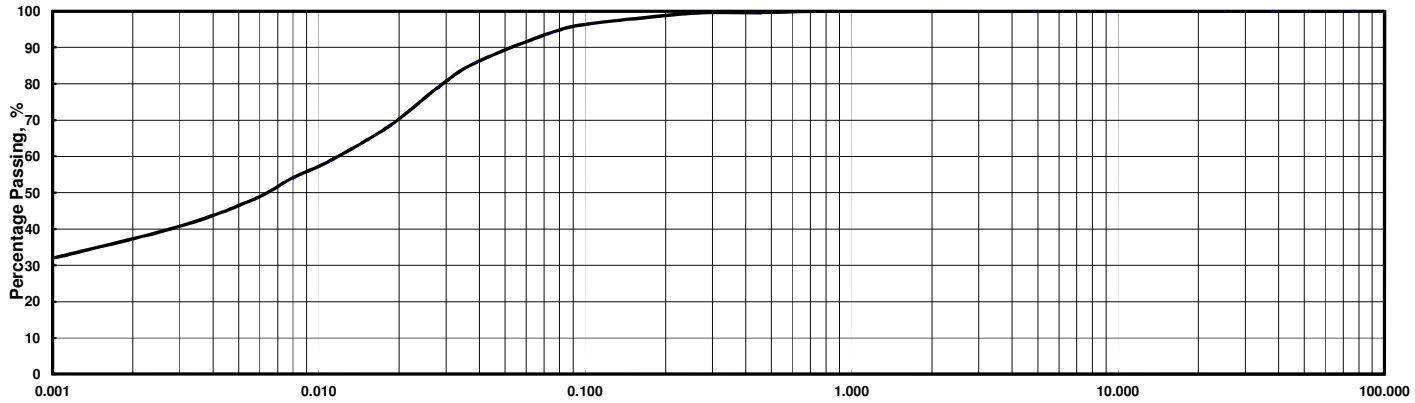
Sample No. : **PP3-17-1 HP-4** Depth : **7.50-8.40m** ( ) Specific Gravity : 2.73

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	99.5	99.4	96.6	94.2
Hydro.	Dia., mm	0.038	0.028	0.018	0.011	0.0079	0.0057	0.0029	0.0009							
	% Passing	85.7	79.0	68.4	58.7	53.9	48.1	40.4	30.8							

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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. Depth	PP3-17-1 HP-4 7.50-8.40m		Sample No. Depth	PP3-17-1 HP-4 7.50-8.40m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.012 mm	
2.00 - 0.425 mm	0.5 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	5.4 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	47.9 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	46.3 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	94.2 %				

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37) PP3-17-2

TABLE SUMMARY OF SOIL TEST

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

Borehole No.			PP3-17-2								
Sample No.		HP-1	HP-2	HP-3	HP-4						
Sample Depth		1.00m ~1.90m	4.00m ~4.90m	7.00m ~7.90m	11.00m ~11.90m						
Condition of Sample		Undisturbed									
Natural Water Content	%	65.3	44.1	35.6	27.6						
Specific Gravity		2.67	2.73	2.72	2.71						
Wet Density	Mg/m^3	1.52	1.76	1.85	1.92						
Dry Density	Mg/m^3	0.92	1.22	1.36	1.51						
Natural Void Ratio		1.90	1.23	1.00	0.80						
Degree of Saturation	%	92	98	97	94						
Atterberg Limits	Liquid Limit, %	69	44	35	27						
	Plastic Limit, %	34	24	20	18						
	Plasticity Index, %	35	20	15	9						
Grain Size Analysis	Gravel, %	0	0	0	0						
	Sand, %	4	15	2	36						
	Silt, %	40	46	56	35						
	Clay & Colloid, %	56	39	42	29						
	Max. diameter, mm	0.850	0.850	0.106	0.425						
	Diam. at 60% mm	0.0059	0.019	0.012	0.060						
	Diam. at 10% mm	-	-	-	-						
Visual soil description		Silt	Clay with Sand	Clay	Sandy Silty Clay						
Unified soil classification		MH	CL	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

Checked by : A. B. Tan

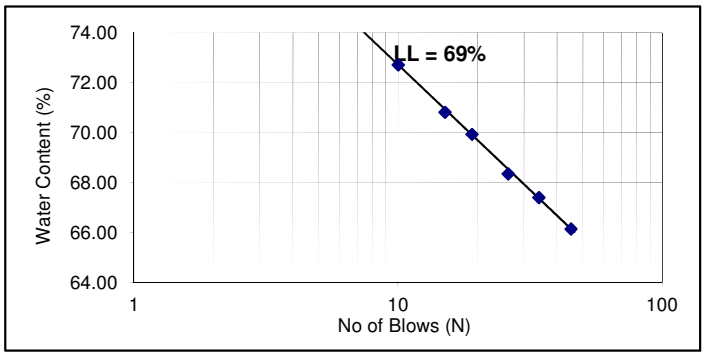
Kiso-Jiban Consultants Co., Ltd.

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 : 12.12.14
Tested By : Vasantha
Checked By : A. B. Tan

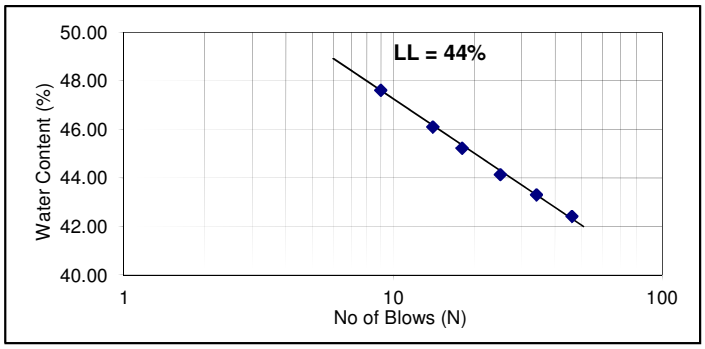
Sample No. : PP3-17-2 HP-1
Depth : 1.00-1.90m
Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	45	66.13
2	34	67.39
3	26	68.35
4	19	69.92
5	15	70.81
6	10	72.71
Liquid Limits %		**69**
Plastic Limits %		**34**
Plasticity Index		**35**



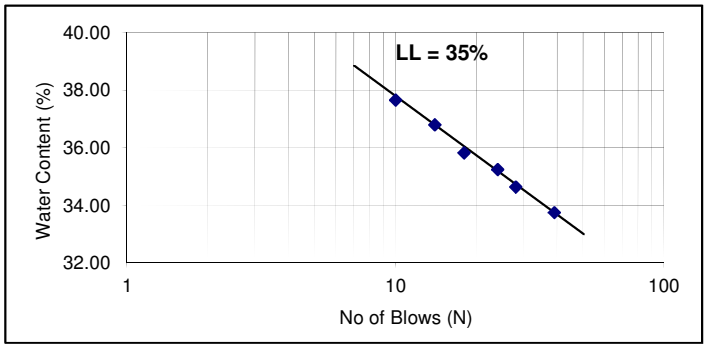
Sample No. : PP3-17-2 HP-2
Depth : 4.00-4.90m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	46	42.42
2	34	43.30
3	25	44.14
4	18	45.22
5	14	46.09
6	9	47.61
Liquid Limits %		**44**
Plastic Limits %		**24**
Plasticity Index		**20**



Sample No. : PP3-17-2 HP-3
Depth : 7.00-7.90m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	39	33.75
2	28	34.63
3	24	35.24
4	18	35.83
5	14	36.80
6	10	37.65
Liquid Limits %		**35**
Plastic Limits %		**20**
Plasticity Index		**15**



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Singapore Branch

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ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project Project No. : S27-14

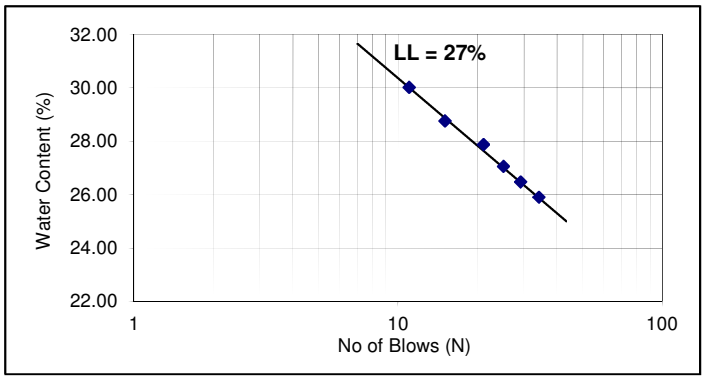
Standard : ASTM D4318-10 Date of Testing : 12.12.14

Tested By : Vasantha Checked By : A. B. Tan

Sample No. : PP3-17-2 HP-4 Depth : 11.00-11.90m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	34	25.89
2	29	26.46
3	25	27.05
4	21	27.86
5	15	28.75
6	11	30.01
Liquid Limits %		**27**
Plastic Limits %		**18**
Plasticity Index		**9**



Kiso-Jiban Consultants Co Ltd
Singapore Branch

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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**

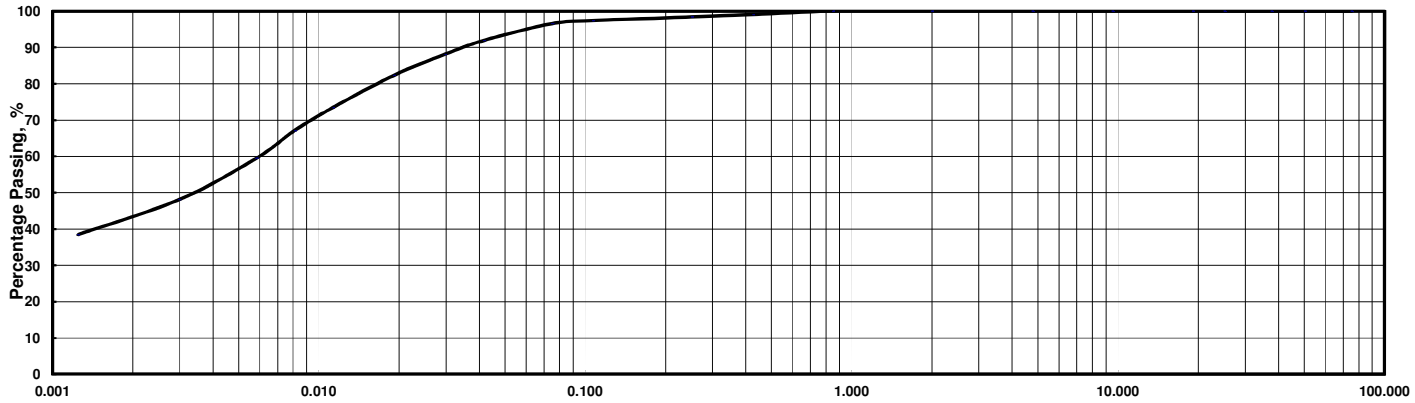
Sample No. : **PP3-17-2 HP-1** Depth : **1.00-1.90m** ( ) Specific Gravity : 2.67

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	99.0	98.4	97.4	96.6
Hydro.	Dia., mm	0.042	0.030	0.019	0.011	0.0081	0.0058	0.0030	0.0012							
	% Passing	91.9	88.1	82.3	73.4	67.1	59.5	48.1	38.5							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-17-2 HP-1 1.00-1.90m		Sample No. Depth	PP3-17-2 HP-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%	0.0059	mm
2.00 - 0.425 mm	1.0	%	Dia. at 30%	-	mm
0.425 - 0.075 mm	2.5	%	Dia. at 10%	-	mm
0.075 - 0.005 mm	40.4	%	Coeff. of Uniformity	-	
Smaller than 0.005 mm	56.2	%	Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%			
425um Sieve Passing	100.0	%			
75um Sieve Passing	96.6	%			

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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**

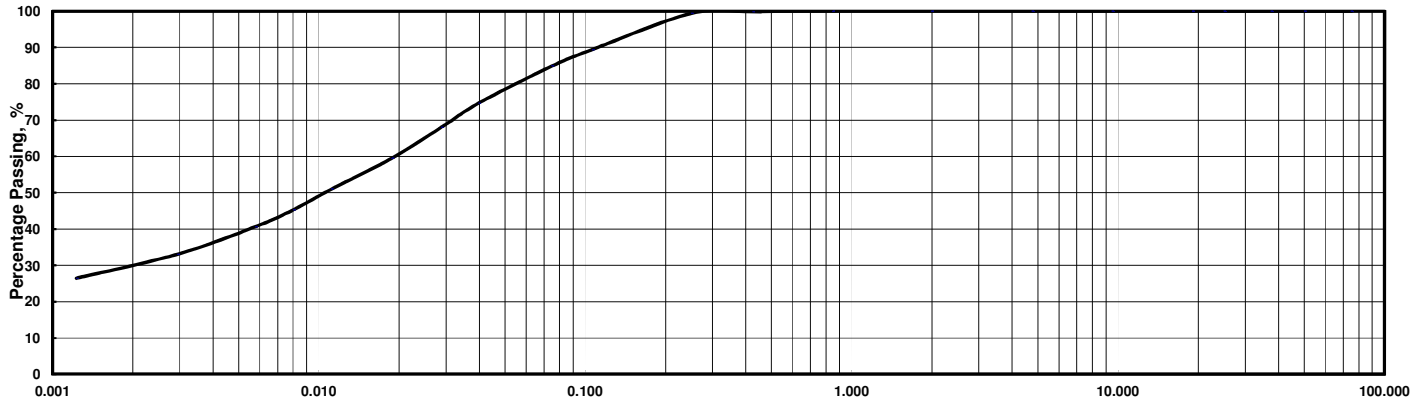
Sample No. : **PP3-17-2 HP-2** Depth : **4.00-4.90m** ( ) Specific Gravity : 2.73

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	99.8	99.4	89.4	84.9
Hydro.	Dia., mm	0.040	0.029	0.019	0.011	0.0080	0.0058	0.0030	0.0012							
	% Passing	74.7	68.0	59.5	51.0	45.4	40.6	33.1	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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. Depth	PP3-17-2 HP-2 4.00-4.90m		Sample No. Depth	PP3-17-2 HP-2 4.00-4.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.019 mm	
2.00 - 0.425 mm	0.2 %		Dia. at 30%	0.0020 mm	
0.425 - 0.075 mm	14.9 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	46.3 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	38.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	84.9 %				

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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**

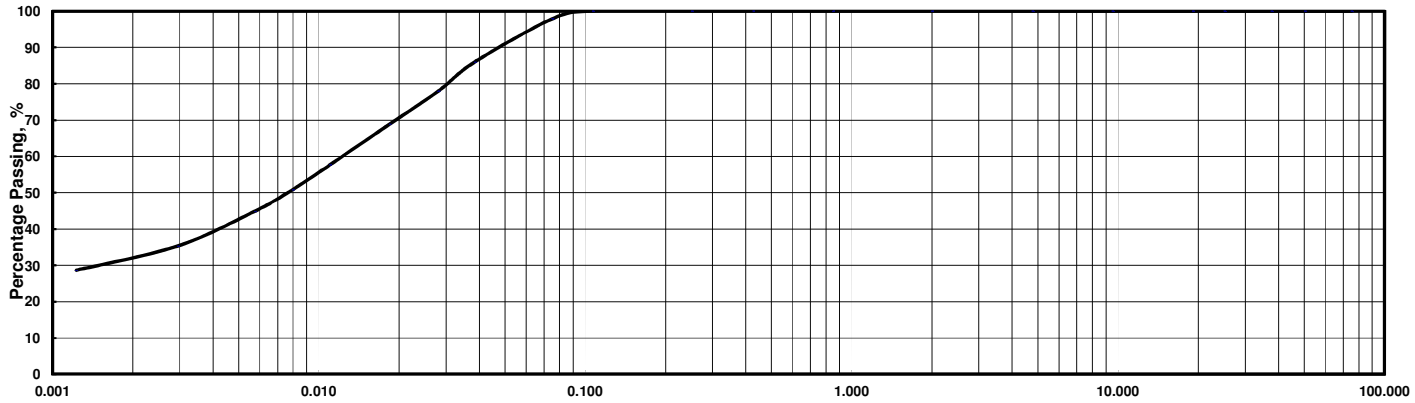
Sample No. : **PP3-17-2 HP-3** Depth : **7.00-7.90m** ( ) Specific Gravity : 2.72

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	100.0	100.0	97.9
Hydro.	Dia., mm	0.038	0.028	0.018	0.011	0.0080	0.0057	0.0029	0.0012							
	% Passing	86.0	77.9	68.8	57.7	50.8	44.9	35.3	28.7							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-17-2 HP-3 7.00-7.90m		Sample No. Depth	PP3-17-2 HP-3 7.00-7.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.106 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.012 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.0015 mm	
0.425 - 0.075 mm	2.1 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	55.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	42.4 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	97.9 %				

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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**

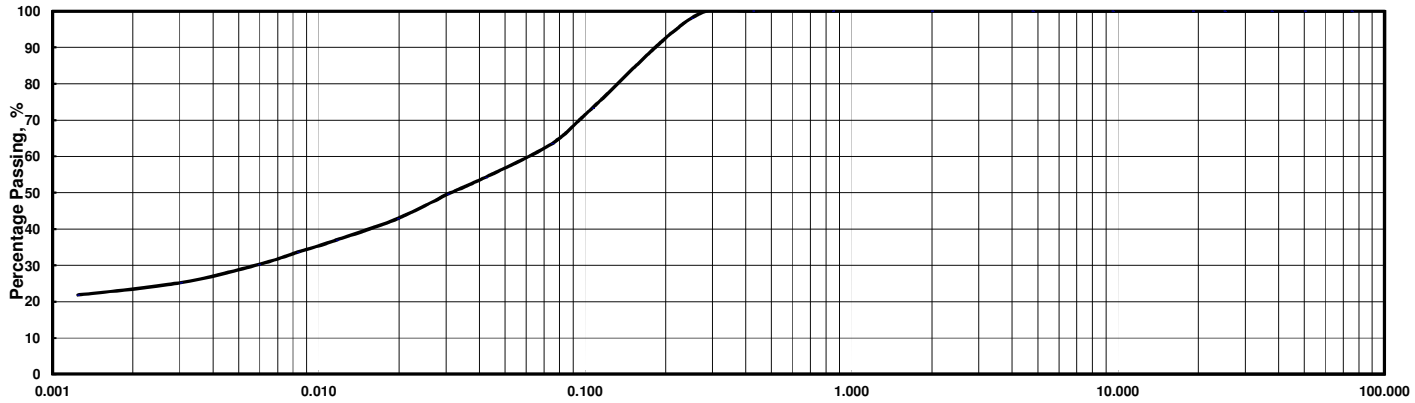
Sample No. : **PP3-17-2 HP-4** Depth : **17.00-17.90m** ( ) Specific Gravity : 2.71

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	98.1	73.3	63.6
Hydro.	Dia., mm	0.042	0.030	0.020	0.012	0.0083	0.0059	0.0030	0.0012							
	% Passing	54.3	49.6	42.8	37.0	33.6	30.2	25.2	21.8							

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	
CLAY		FINE	MEDIUM	COARSE	FINE	COARSE		
	SILT	SAND			GRAVEL			

Sample No. / Depth	PP3-17-2 HP-4 17.00-17.90m		Sample No. / Depth	PP3-17-2 HP-4 17.00-17.90m	
Larger than 4.75 mm	0.0	%	Max. Diameter	0.425	mm
4.75 - 2.00 mm	0.0	%	Dia. at 60%	0.060	mm
2.00 - 0.425 mm	0.0	%	Dia. at 30%	0.0057	mm
0.425 - 0.075 mm	36.4	%	Dia. at 10%	-	mm
0.075 - 0.005 mm	34.9	%	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	63.6	%			

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38) PP3-19-1

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TABLE SUMMARY OF SOIL TEST

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

Borehole No.			PP3-19-1								
Sample No.			HP-1	HP-2	HP-3	HP-4	HP-5	HP-6			
Sample Depth			1.00m ~1.70m	3.00m ~3.83m	6.00m ~6.40m	6.50m ~7.35m	10.00m ~10.85m	13.00m ~13.85m			
Condition of Sample			Undisturbed								
Natural Water Content		%	49.3	39.0	39.0	39.5	32.5	35.5			
Specific Gravity			2.75	2.74	2.74	2.74	2.73	2.74			
Wet Density		Mg/m^3	1.60	1.82	1.82	1.80	1.86	1.85			
Dry Density		Mg/m^3	1.07	1.31	1.31	1.29	1.40	1.36			
Natural Void Ratio			1.57	1.10	1.09	1.12	0.95	1.01			
Degree of Saturation		%	86	97	98	96	94	96			
Atterberg Limits	Liquid Limit,	%	62	39	38	40	33	35			
	Plastic Limit,	%	29	22	22	22	20	20			
	Plasticity Index,	%	33	17	16	18	13	15			
Grain Size Analysis	Gravel,	%	0	0	0	0	0	0			
	Sand,	%	3	1	8	4	25	14			
	Silt,	%	33	57	48	51	37	44			
	Clay & Colloid,	%	64	42	44	45	38	42			
	Max. diameter,	mm	0.850	0.106	0.425	0.250	0.425	0.250			
	Diam. at 60%	mm	0.0039	0.016	0.015	0.012	0.032	0.017			
	Diam. at 10%	mm		-	-	-	-	-			
Visual soil description			Clay	Clay	Clay	Clay	Clay with Sand	Clay			
Unified soil classification			CH	CL	CL	CL	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

Checked by : A. B. Tan

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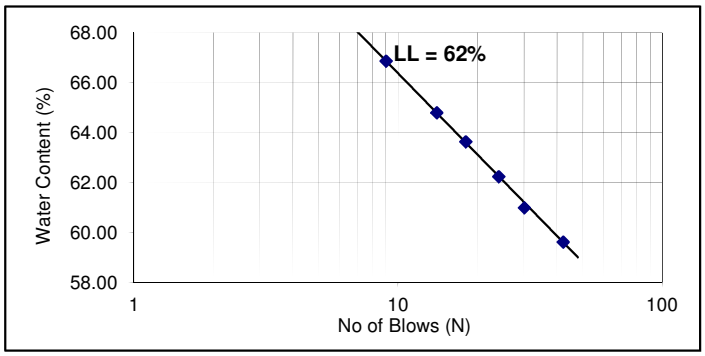
ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14
Standard : ASTM D4318-10
Date of Testing : 09.12.14
Tested By : Vasantha
Checked By : A. B. Tan

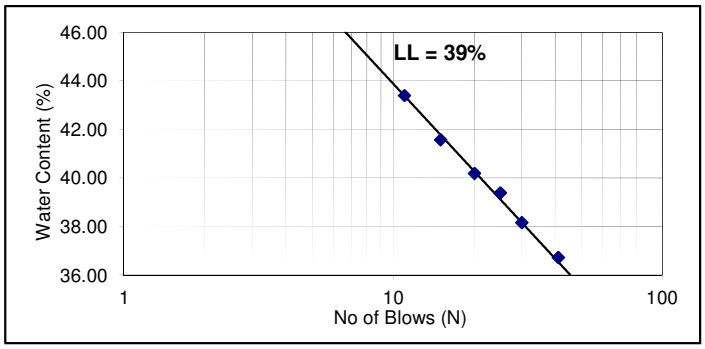
Sample No. : PP3-19-1 HP-1
Depth : 1.00-1.70m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	42	59.62
2	30	60.99
3	24	62.23
4	18	63.63
5	14	64.79
6	9	66.85
Liquid Limits %		**62**
Plastic Limits %		**29**
Plasticity Index		**33**



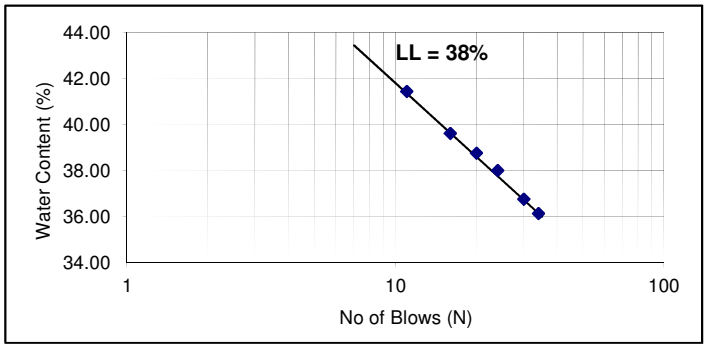
Sample No. : PP3-19-1 HP-2
Depth : 3.00-3.83m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	41	36.73
2	30	38.16
3	25	39.38
4	20	40.19
5	15	41.57
6	11	43.38
Liquid Limits %		**39**
Plastic Limits %		**22**
Plasticity Index		**17**



Sample No. : PP3-19-1 HP-3
Depth : 6.00-6.40m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	34	36.14
2	30	36.77
3	24	38.01
4	20	38.77
5	16	39.62
6	11	41.44
Liquid Limits %		**38**
Plastic Limits %		**22**
Plasticity Index		**16**



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Singapore Branch

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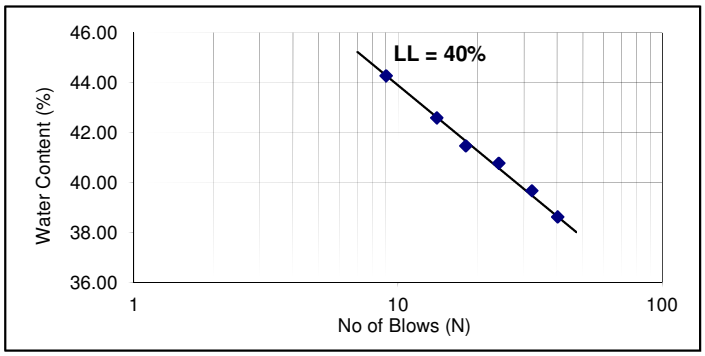
ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14
Standard : ASTM D4318-10
Date of Testing : 10.12.14
Tested By : Vasantha
Checked By : A. B. Tan

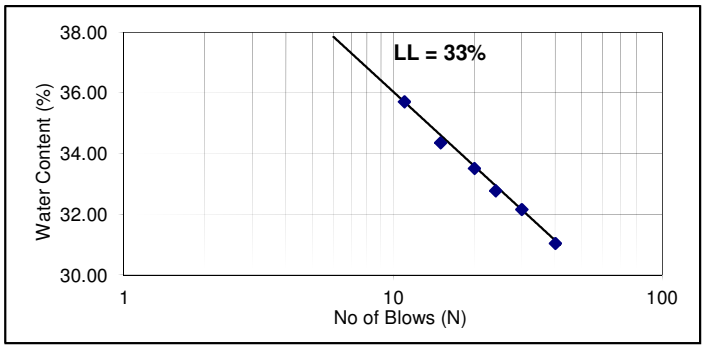
Sample No. : PP3-19-1 HP-4
Depth : 6.50-7.35m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	40	38.62
2	32	39.67
3	24	40.77
4	18	41.47
5	14	42.59
6	9	44.27
Liquid Limits %		**40**
Plastic Limits %		**22**
Plasticity Index		**18**



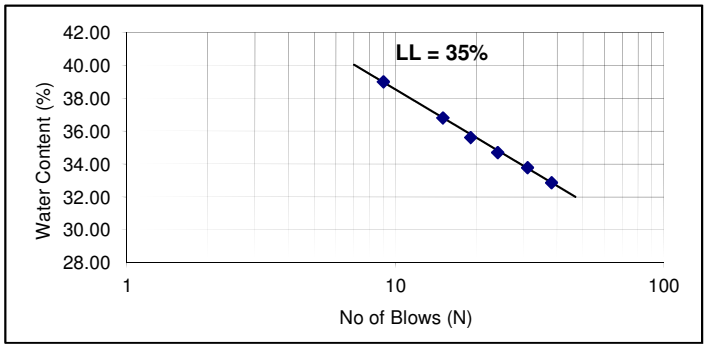
Sample No. : PP3-19-1 HP-5
Depth : 10.00-10.85m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	40	31.04
2	30	32.15
3	24	32.77
4	20	33.51
5	15	34.36
6	11	35.70
Liquid Limits %		**33**
Plastic Limits %		**20**
Plasticity Index		**13**



Sample No. : PP3-19-1 HP-6
Depth : 13.00-13.85m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	38	32.87
2	31	33.79
3	24	34.71
4	19	35.63
5	15	36.81
6	9	39.01
Liquid Limits %		**35**
Plastic Limits %		**20**
Plasticity Index		**15**



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Singapore Branch

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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 : **08.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

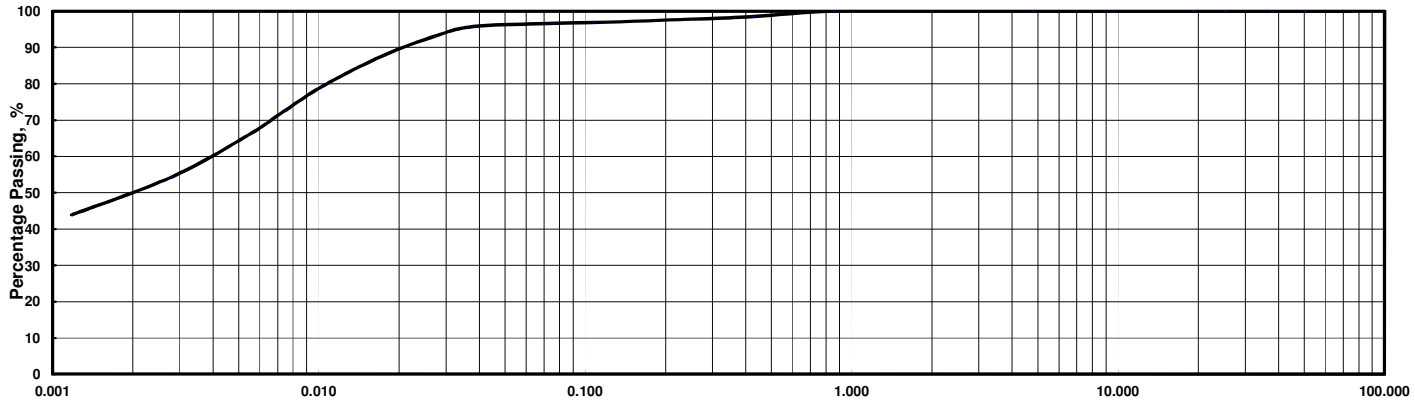
Sample No. : **PP3-19-1 HP-1** Depth : **1.00-1.70m** ( ) Specific Gravity : 2.75

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	98.5	97.8	96.8	96.6
Hydro.	Dia., mm	0.038	0.027	0.017	0.010	0.0075	0.0054	0.0028	0.0012							
	% Passing	95.7	93.0	87.8	79.4	72.7	65.8	54.3	43.9							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-19-1 HP-1 1.00-1.70m			Sample No. Depth	PP3-19-1 HP-1 1.00-1.70m	
Larger than 4.75 mm	0.0	%		Max. Diameter	0.850	mm
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.0039	mm
2.00 - 0.425 mm	1.5	%		Dia. at 30%	-	mm
0.425 - 0.075 mm	1.9	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	32.6	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	64.0	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	100.0	%				
75um Sieve Passing	96.6	%				

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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 : **08.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

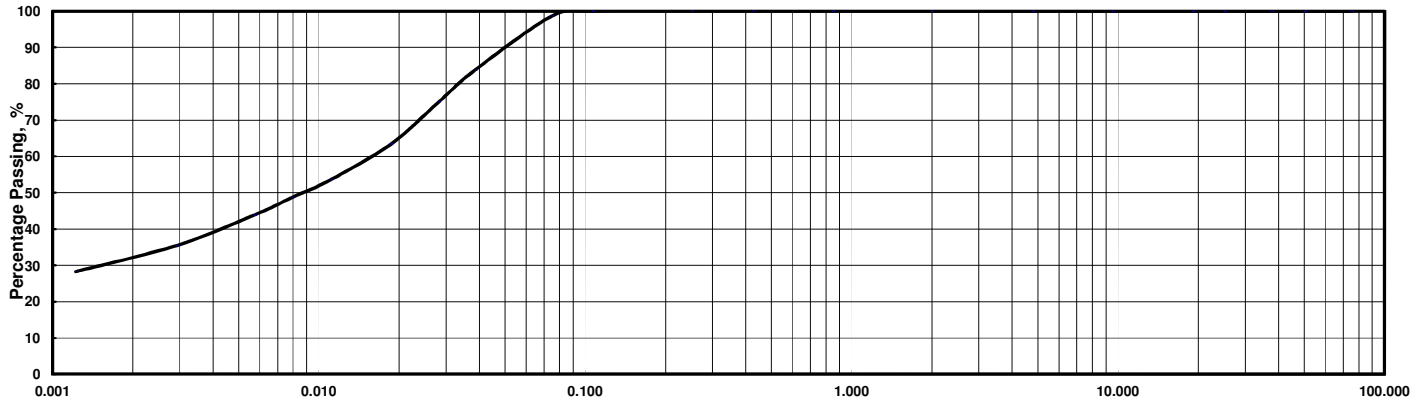
Sample No. : **PP3-19-1 HP-2** Depth : **3.00-3.83m** ( ) Specific Gravity : 2.74

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	100.0	100.0	100.0	98.7
Hydro.	Dia., mm	0.039	0.028	0.019	0.011	0.0080	0.0057	0.0029	0.0012							
	% Passing	83.9	75.1	63.4	53.6	48.8	43.9	35.5	28.3							

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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. Depth	PP3-19-1 HP-2 3.00-3.83m		Sample No. Depth	PP3-19-1 HP-2 3.00-3.83m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.106 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.016 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.0015 mm	
0.425 - 0.075 mm	1.3 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	57.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	41.7 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	98.7 %				

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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 : **08.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

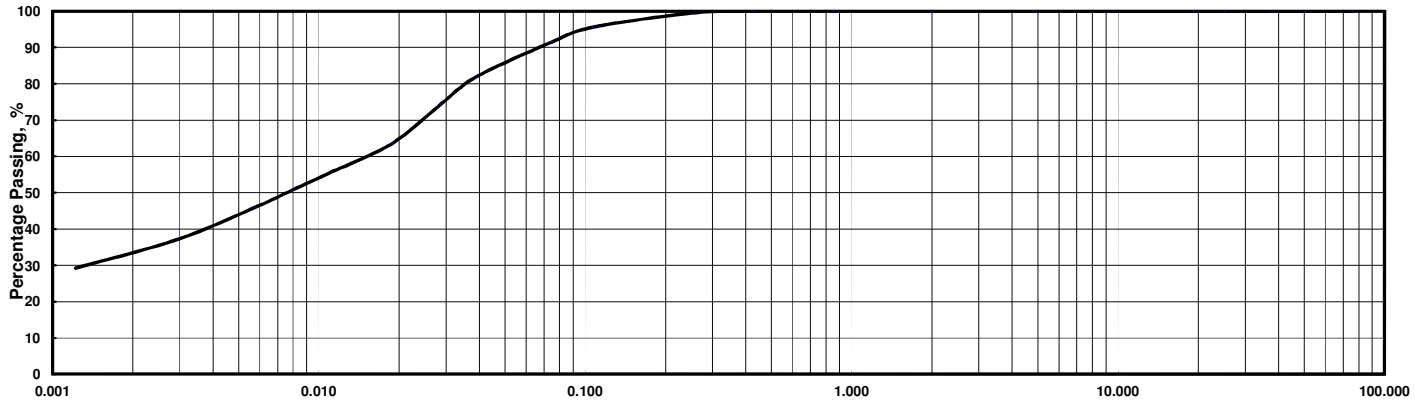
Sample No. : **PP3-19-1 HP-3** Depth : **6.00-6.40m** ( ) Specific Gravity : 2.74

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	100.0	99.4	95.5	91.5
Hydro.	Dia., mm	0.039	0.028	0.019	0.011	0.0079	0.0057	0.0029	0.0012							
	% Passing	81.9	74.1	63.4	55.6	50.7	45.8	37.1	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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. Depth	PP3-19-1 HP-3 6.00-6.40m		Sample No. Depth	PP3-19-1 HP-3 6.00-6.40m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.015 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.0013 mm	
0.425 - 0.075 mm	8.5 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	47.9 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	43.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	91.5 %				

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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 : **08.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

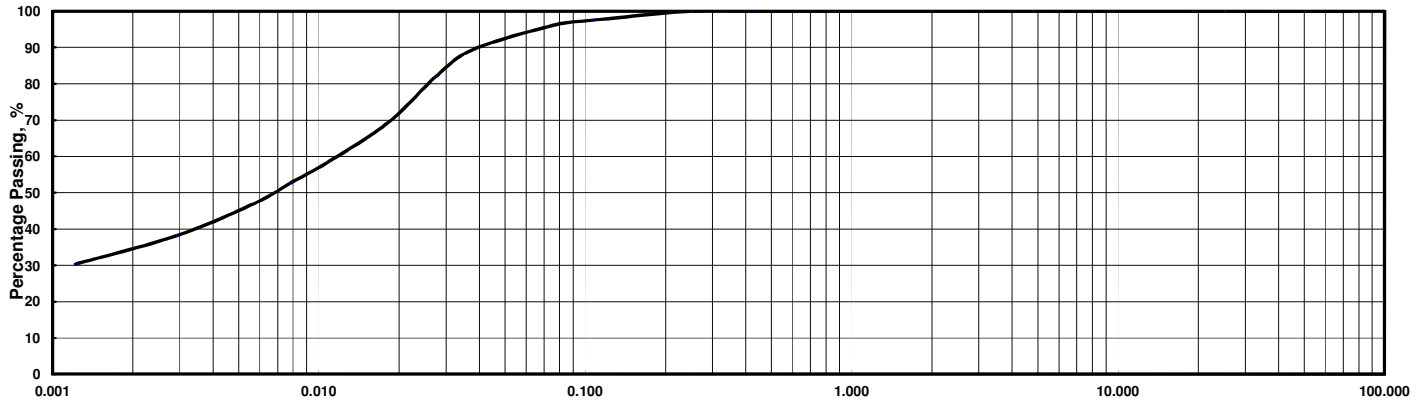
Sample No. : **PP3-19-1 HP-4** Depth : **6.50-7.35m** ( ) Specific Gravity : 2.74

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	100.0	100.0	97.5	96.0
Hydro.	Dia., mm	0.038	0.028	0.018	0.011	0.0079	0.0057	0.0029	0.0012							
	% Passing	89.4	82.2	69.5	58.7	52.8	47.0	38.2	30.3							

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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. Depth	PP3-19-1 HP-4 6.50-7.35m		Sample No. Depth	PP3-19-1 HP-4 6.50-7.35m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.250 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.012 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	4.0 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	51.2 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	44.8 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	96.0 %				

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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 : **08.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

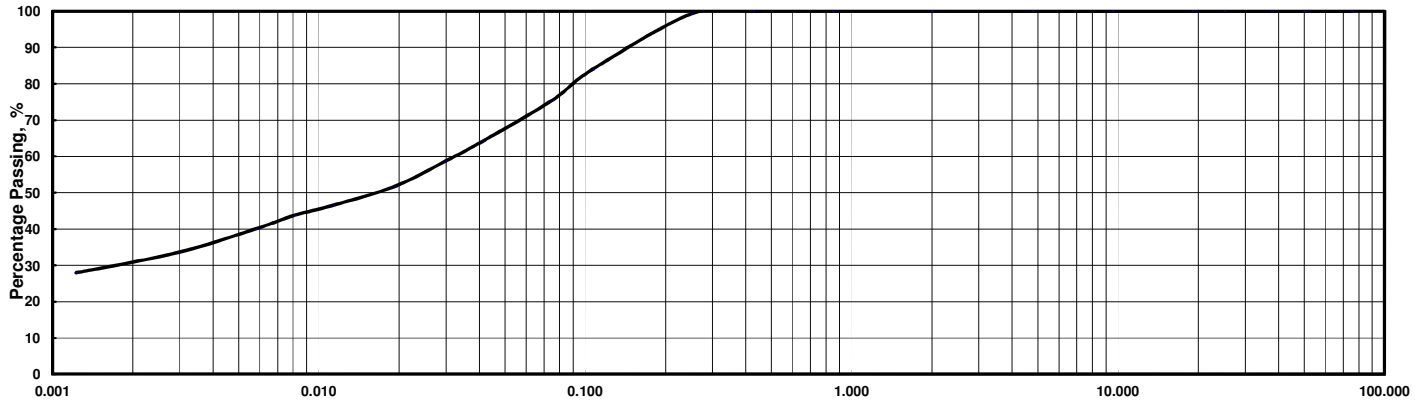
Sample No. : **PP3-19-1 HP-5** Depth : **10.00-10.85m** ( ) Specific Gravity : 2.73

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	100.0	99.3	83.9	75.4
Hydro.	Dia., mm	0.041	0.030	0.019	0.011	0.0081	0.0058	0.0030	0.0012							
	% Passing	64.3	58.7	51.8	46.6	43.8	40.1	33.5	27.9							

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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. Depth	PP3-19-1 HP-5 10.00-10.85m		Sample No. Depth	PP3-19-1 HP-5 10.00-10.85m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.032 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.0017 mm	
0.425 - 0.075 mm	24.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	37.2 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	38.2 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	75.4 %				

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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 : **08.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

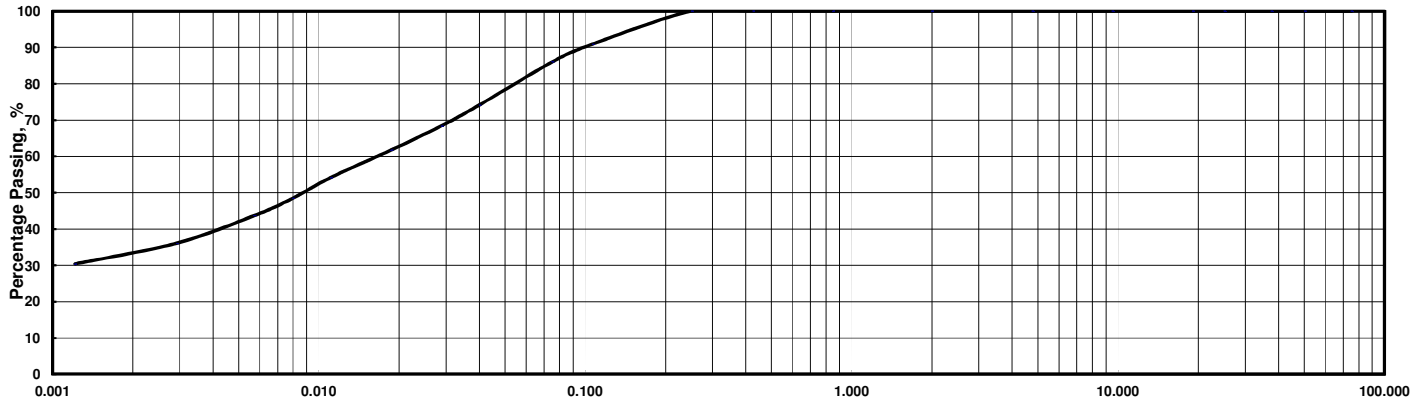
Sample No. : **PP3-19-1 HP-6** Depth : **13.00-13.85m** ( ) Specific Gravity : 2.74

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	100.0	100.0	90.9	86.0
Hydro.	Dia., mm	0.040	0.029	0.019	0.011	0.0080	0.0057	0.0029	0.0012							
	% Passing	74.1	68.4	61.8	54.2	48.5	43.7	36.1	30.4							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-19-1 HP-6 13.00-13.85m		Sample No. Depth	PP3-19-1 HP-6 13.00-13.85m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.250 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.017 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	14.0 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	44.2 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	41.8 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	86.0 %				

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39) PP3-19-2

TABLE SUMMARY OF SOIL TEST

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

Borehole No.			PP3-19-2								
Sample No.			HP-1	HP-2	D-1	HP-3	HP-4				
Sample Depth			3.00m ~3.85m	6.00m ~6.90m	12.50m ~13.40m	13.00m ~13.85m	16.00m ~16.85m				
Condition of Sample			Undisturbed								
Natural Water Content		%	43.9	39.1	22.1	38.1	22.4				
Specific Gravity			2.74	2.74	2.69	2.74	2.70				
Wet Density		Mg/m^3	1.79	1.84	-	1.84	-				
Dry Density		Mg/m^3	1.24	1.32	-	1.33	-				
Natural Void Ratio			1.20	1.07	-	1.06	-				
Degree of Saturation		%	100	100	-	98	-				
Atterberg Limits	Liquid Limit,	%	41	39	- *3	38	- *3				
	Plastic Limit,	%	24	22	- *3	21	- *3				
	Plasticity Index,	%	17	17	- *3	17	- *3				
Grain Size Analysis	Gravel,	%	0	0	0	0	0				
	Sand,	%	2	7	73	8	60				
	Silt,	%	52	53	9	43	16				
	Clay & Colloid,	%	46	40	18	49	24				
	Max. diameter,	mm	0.425	0.850	2.00	0.425	2.00				
	Diam. at 60%	mm	0.012	0.043	0.16	0.010	0.14				
	Diam. at 10%	mm	-	-	-	-	-				
Visual soil description			Clay	Clay	Clayey Sand	Clay	Clayey Sand				
Unified soil classification			CL	CL	-	CL	-				
Triaxial compression test	Angle of Internal Friction	(^{0})	0	0	-	-	-				
	Cohesion Intercept, kPa		16	22	-	-	-				
	Condition of drainage		UU	UU	-	-	-				
	Angle of Internal Friction *2	(^{0})	38	-	-	-	-				
	Cohesion Intercept, kPa *2		0	-	-	-	-				
	Condition of drainage		$\overline{CU}$	-	-	-	-				
Consolidation Test	Preconsolidation Pressure,	kPa	72	92	-	190	-				
	Compression Index(Average)		0.38	0.30	-	0.34	-				
	Pressure Range for Compression Index(kPa)		200-1600	200-1600	-	400-3200	-				
	Swell index		0.10	0.068	-	0.089	-				
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

Checked by : A. B. Tan

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ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project Project No. : S27-14

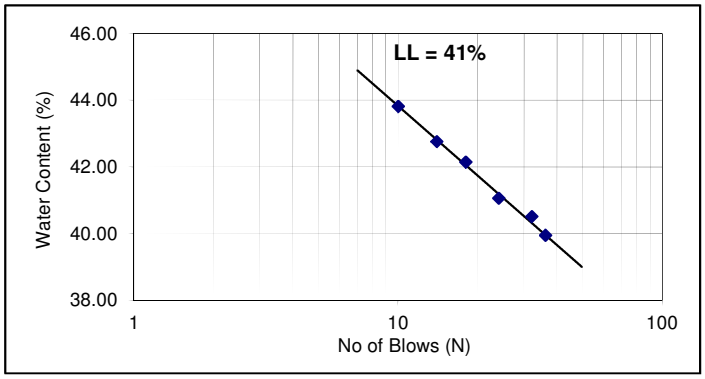
Standard : ASTM D4318-10 Date of Testing : 20.10.14

Tested By : Vasantha Checked By : A. B. Tan

Sample No. : PP3-19-2 HP-1 Depth : 3.00-3.85m

Remarks : Tested on material at natural state

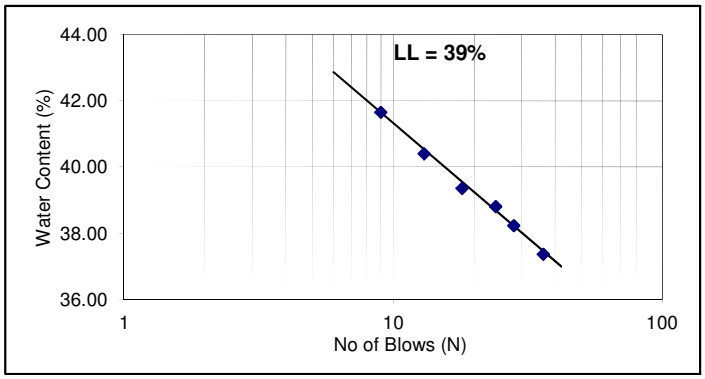
Liquid Limits Test		
Test No.	Blows	Wn
1	36	39.96
2	32	40.51
3	24	41.06
4	18	42.14
5	14	42.76
6	10	43.81
Liquid Limits %		**41**
Plastic Limits %		**24**
Plasticity Index		**17**



Sample No. : PP3-19-2 HP-2 Depth : 6.00-6.90m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	36	37.37
2	28	38.23
3	24	38.80
4	18	39.36
5	13	40.40
6	9	41.65
Liquid Limits %		**39**
Plastic Limits %		**22**
Plasticity Index		**17**



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ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project Project No. : S27-14

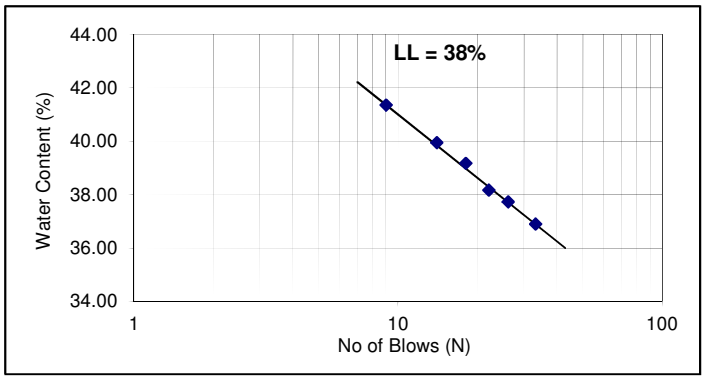
Standard : ASTM D4318-10 Date of Testing : 01.12.14

Tested By : Vasantha Checked By : A. B. Tan

Sample No. : PP3-19-2 HP-3 Depth : 13.00-13.85m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	33	36.89
2	26	37.72
3	22	38.16
4	18	39.17
5	14	39.93
6	9	41.35
Liquid Limits %		**38**
Plastic Limits %		**21**
Plasticity Index		**17**



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Singapore Branch

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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**

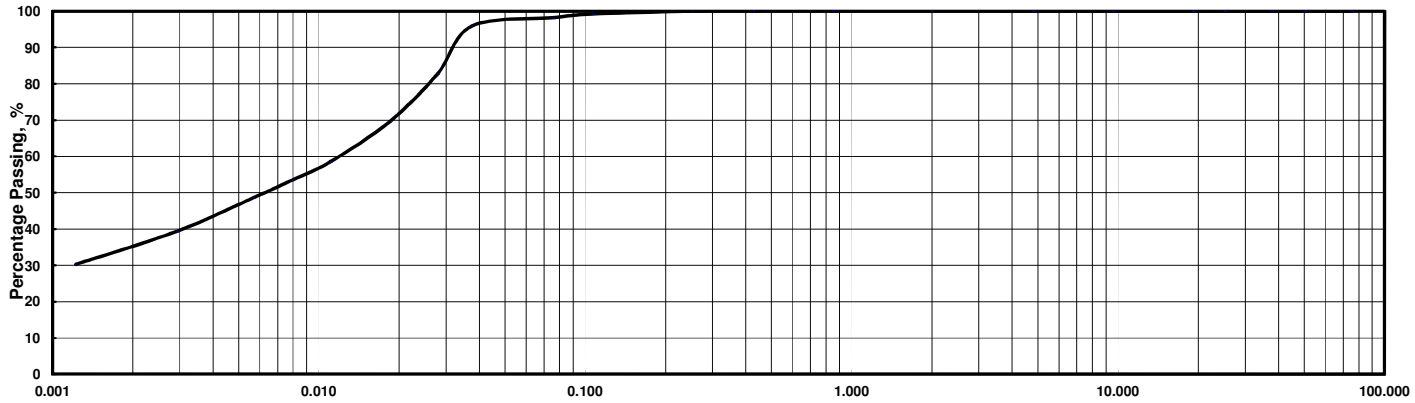
Sample No. : **PP3-19-2 HP-1** Depth : **3.00-3.85m** ( ) Specific Gravity : 2.74

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	100.0	99.9	99.2	98.2
Hydro.	Dia., mm	0.037	0.028	0.018	0.011	0.0079	0.0057	0.0029	0.0012							
	% Passing	95.9	82.7	69.6	58.5	53.5	48.6	39.4	30.3							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-19-2 HP-1 3.00-3.85m		Sample No. Depth	PP3-19-2 HP-1 3.00-3.85m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.012 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	1.8 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	51.9 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	46.3 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	98.2 %				

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 : **16.10.14** Tested By : **Htet Paing/Shariful** Checked by : **A. B. Tan**

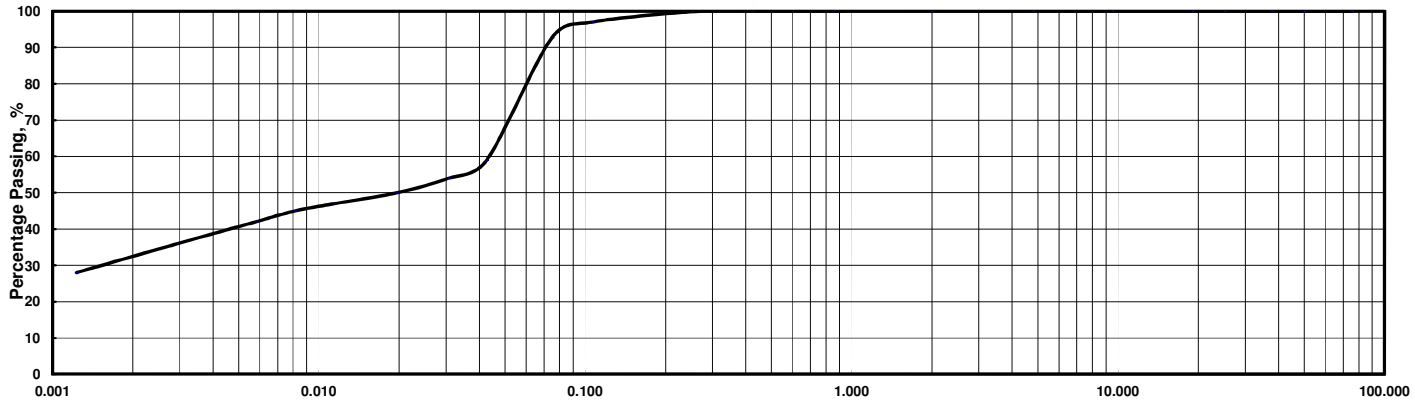
Sample No. : **PP3-19-2 HP-2** Depth : **6.00-6.90m** ( ) Specific Gravity : 2.74

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	99.9	99.8	97.0	92.7
Hydro.	Dia., mm	0.043	0.031	0.020	0.011	0.0081	0.0058	0.0029	0.0012							
	% Passing	59.0	54.0	50.0	47.0	45.0	42.0	36.0	28.0							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-19-2 HP-2 6.00-6.90m		Sample No. Depth	PP3-19-2 HP-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%	0.043 mm	
2.00 - 0.425 mm	0.1 %		Dia. at 30%	0.0015 mm	
0.425 - 0.075 mm	7.2 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	52.4 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	40.3 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	92.7 %				

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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**

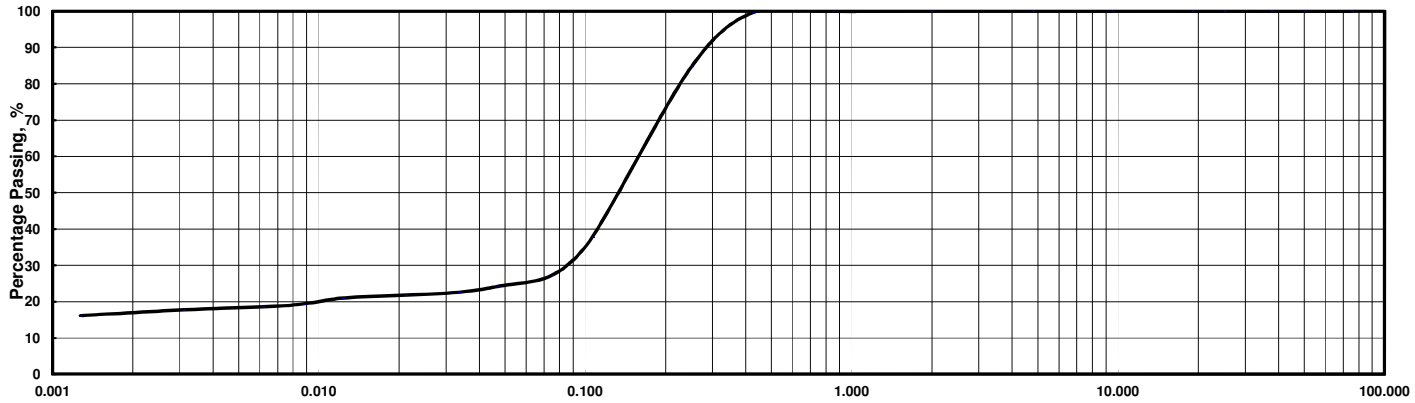
Sample No. : **PP3-19-2 D-1** Depth : **9.50-10.30m** ( ) Specific Gravity : 2.69

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	99.6	84.7	37.8	27.3
Hydro.	Dia., mm	0.047	0.033	0.021	0.012	0.0087	0.0062	0.0031	0.0013							
	% Passing	24.2	22.6	21.8	21.0	19.4	18.6	17.8	16.1							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-19-2 D-1 9.50-10.30m		Sample No. Depth	PP3-19-2 D-1 9.50-10.30m	
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	0.4 %		Dia. at 30%	0.082 mm	
0.425 - 0.075 mm	72.3 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	9.1 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	18.3 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.9 %				
75um Sieve Passing	27.3 %				

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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**

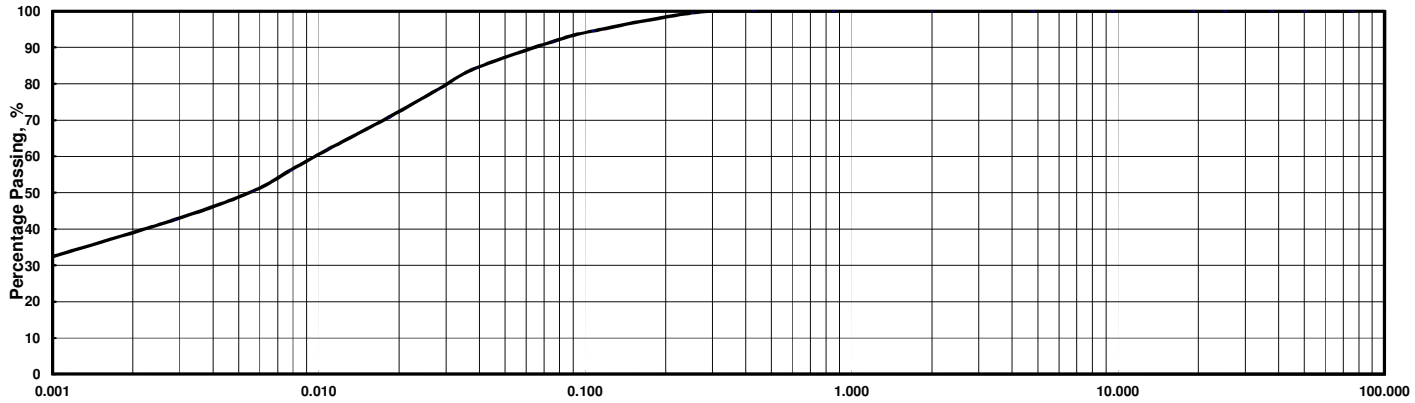
Sample No. : **PP3-19-2 HP-3** Depth : **13.00-13.85m** ( ) Specific Gravity : 2.74

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	100.0	99.5	94.5	91.6
Hydro.	Dia., mm	0.039	0.028	0.018	0.011	0.0078	0.0056	0.0029	0.0009							
	% Passing	84.2	78.4	70.7	62.0	56.2	50.4	42.6	31.0							

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	FINE	COARSE
		SAND			GRAVEL	

Sample No. Depth	PP3-19-2 HP-3 13.00-13.85m		Sample No. Depth	PP3-19-2 HP-3 13.00-13.85m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.010 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	8.4 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	43.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	48.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	91.6 %				

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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**

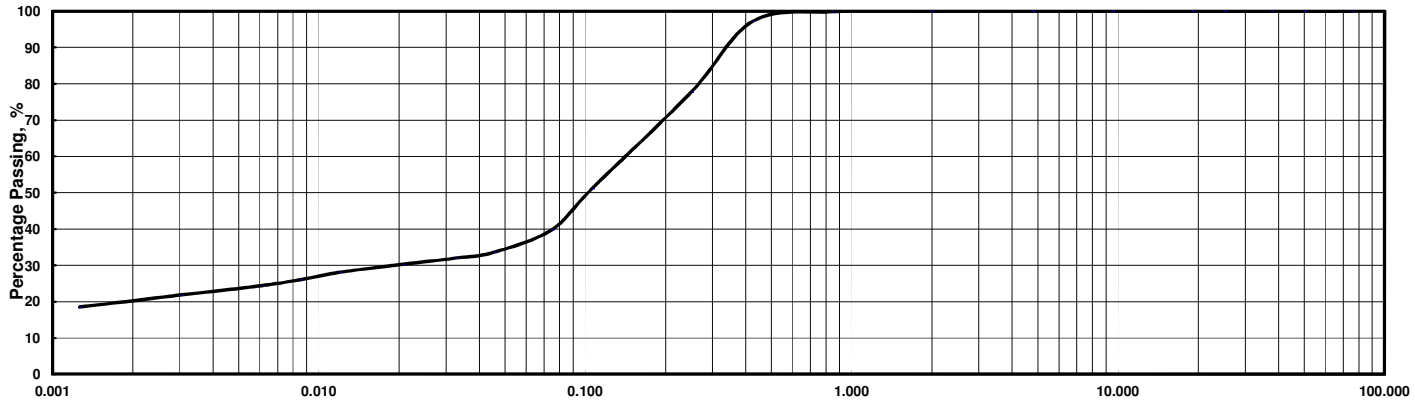
Sample No. : **PP3-19-2 HP-4** Depth : **16.00-16.85m** ( ) Specific Gravity : 2.70

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	97.2	77.8	51.2	39.9
Hydro.	Dia., mm	0.046	0.032	0.021	0.012	0.0085	0.0061	0.0031	0.0013							
	% Passing	33.7	32.0	30.3	28.1	26.1	24.4	21.9	18.5							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-19-2 HP-4 16.00-16.85m		Sample No. Depth	PP3-19-2 HP-4 16.00-16.85m	
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	2.8	%	Dia. at 30%	0.019	mm
0.425 - 0.075 mm	57.4	%	Dia. at 10%	-	mm
0.075 - 0.005 mm	16.3	%	Coeff. of Uniformity	-	
Smaller than 0.005 mm	23.5	%	Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%			
425um Sieve Passing	99.8	%			
75um Sieve Passing	39.9	%			

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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 : 13.10.14

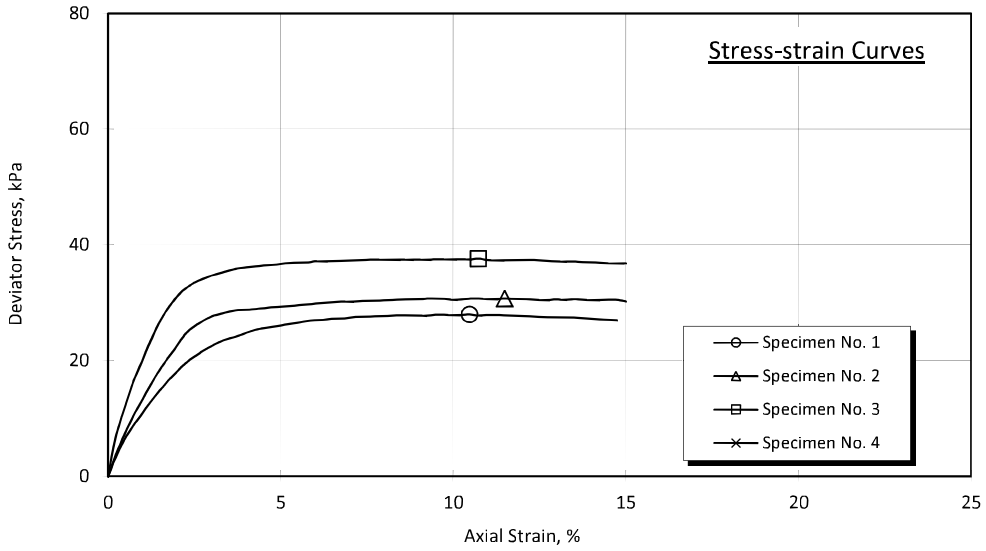
Borehole No.: PP3-19-2 Depth 3.00-3.85m

Tested by : Perera

Sample No. : HP-1 Strain Rate 1.00 %/min

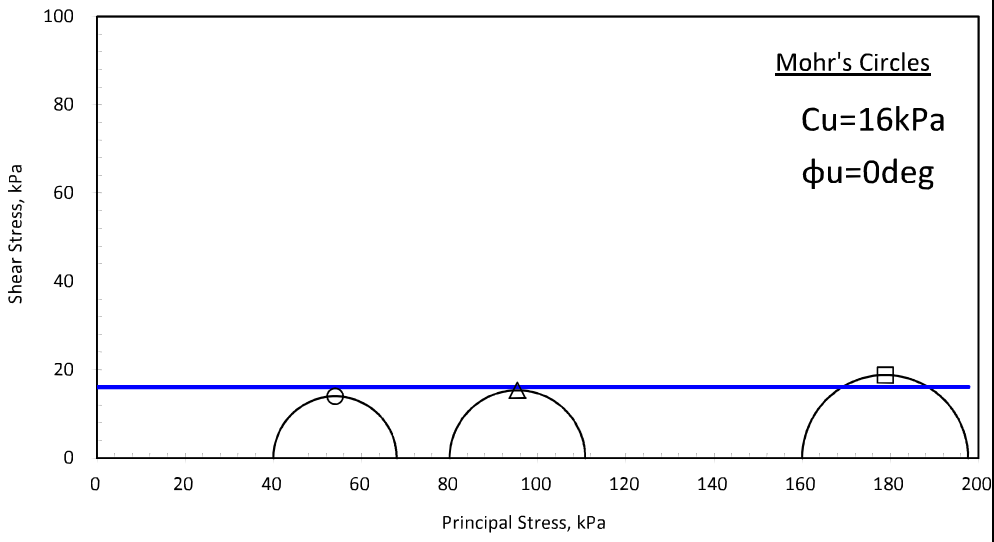
Checked by : A. B. Tan

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	46.6	1.73	1.18	40	28.0	1013	N/A	10.47
2	Undisturbed	99.80	50.00	44.2	1.77	1.23	80	30.7	1294	N/A	11.48
3	Undisturbed	99.80	50.00	43.4	1.77	1.24	160	37.6	2076	N/A	10.72
4											




After shearing (Spec. 1)


After shearing (Spec. 2)



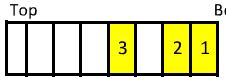

After shearing (Spec. 3)

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



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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 : 13.10.14

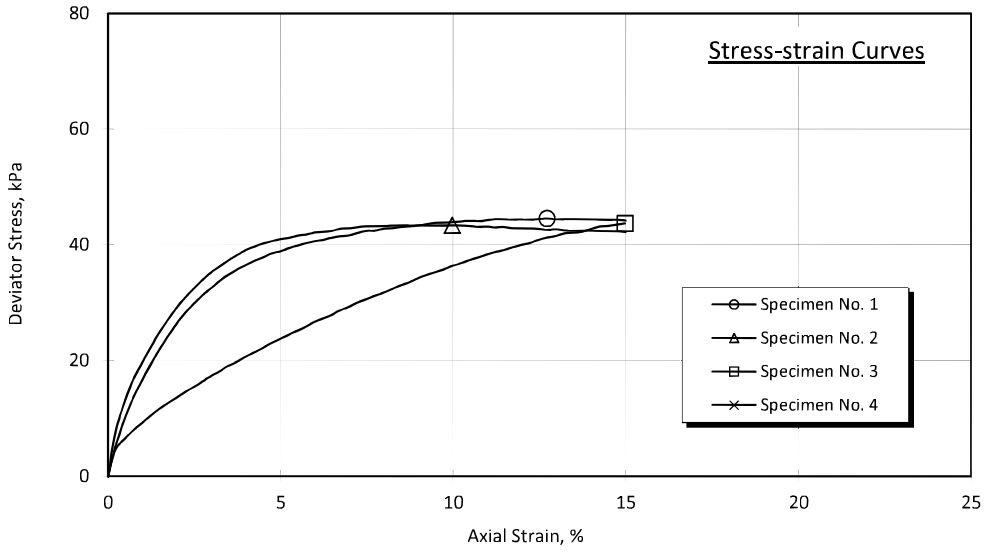
Borehole No.: PP3-19-2 Depth 6.00-6.90m

Tested by : Perera

Sample No. : HP-2 Strain Rate 1.00 %/min

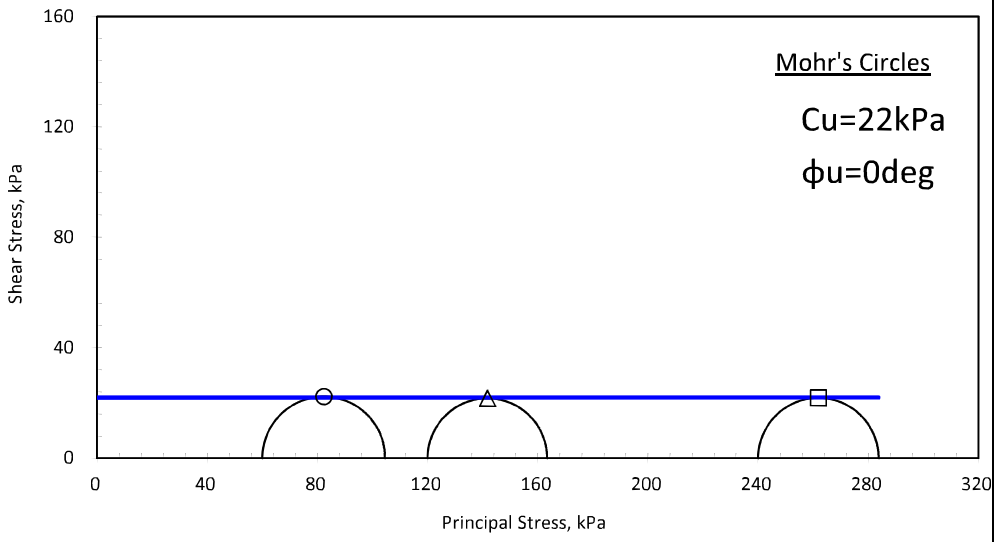
Checked by : A. B. Tan

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	37.6	1.84	1.34	60	44.5	1457	N/A	12.72
2	Undisturbed	99.80	50.00	42.1	1.79	1.26	120	43.4	1839	N/A	9.97
3	Undisturbed	99.80	50.00	47.8	1.86	1.26	240	43.7	499	N/A	14.97
4											




After shearing (Spec. 1)


After shearing (Spec. 2)

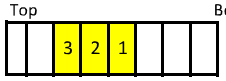



After shearing (Spec. 3)

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



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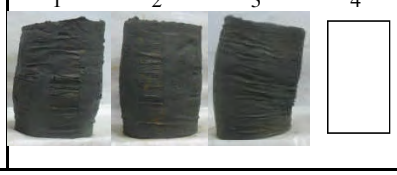
Summary of Consolidated Undrained Triaxial Compression Test
With Porewater Pressure Measurement

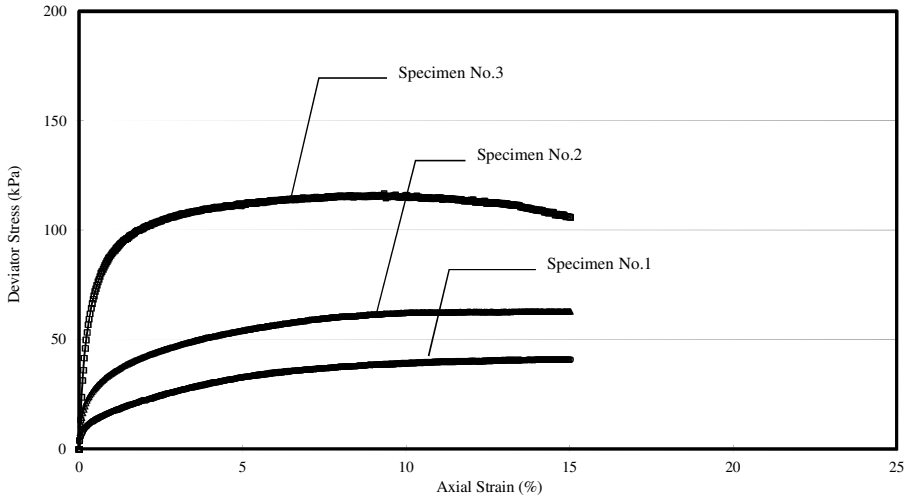
Project No.: S27-14		Project :Preparatory Survey on Matarbari USC Coral-fired Power Project					
Date Tested : 17.10.14		Tested by : Perera		Checked by : A. B. Tan			
Borehole No : PP3-19-2		Sample No.:HP-1		Depth :3.00-3.85m			
Specimen Condition : Undisturbed		Test Method : ASTM D4767-11					
Soil Description : Clay		Ave. Diameter : 50.0mm		Ave. Height : 99.8mm			
Specimen No.			1	2	3		
Initial Condition	Wet Density,	Mg/m^3	1.71	1.73	1.76		
	Water Content,	%	43.4	45.5	43.5		
	Dry Density	Mg/m^3	1.19	1.19	1.23		
Saturation Stage	Saturated PWP,	kPa	500	500	500		
	Final Cell Pressure,	kPa	540	580	660		
	B-value		0.95	0.96	0.95		
Consolidation	Cell Pressure	kPa	540	580	660		
	Back Pressure	kPa	500	500	500		
	Initial PWP,	kPa	529	567	643		
	Final PWP	kPa	500	500	500		
Consolidation Parameter	Total Volume Change,	%	2.87	4.75	8.72		
	Coefficient of Consolidation Cv,	m^2/year	0.57	0.67	0.61		
	Coefficient of Volume Compressibility mvi,	m^2/MN	0.72	0.59	0.54		
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	41	63	117		
	Excess PWP at $(\sigma_1-\sigma_3)f$	kPa	25	57	128		
	A-Coefficient		0.61	0.91	1.10		
	Strain at $(\sigma_1-\sigma_3)f$	(%)	14.93	14.83	9.33		
	Effective Principal Stress Ratio		3.72	3.79	4.62		
Final Conditions	Wet Density,	Mg/m^3	1.83	1.83	1.86		
	Water Content,	%	40.3	40.0	37.3		
Shear Strength Parameters	In terms of Effective Stress $\phi' = 38$ Degree $c' = 0$ kPa		Mode of Failure 1 2 3 4 				
Remarks :							

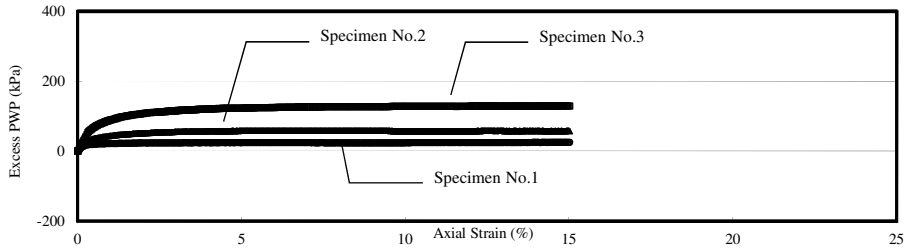
Consolidated Undrained Triaxial Compression Test
With Porewater Pressure Measurement

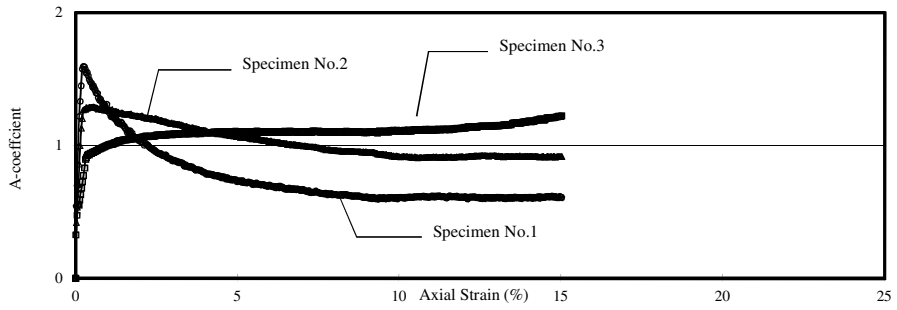
Project : Preparatory Survey on Matarbari USC Coral-fired Power Project

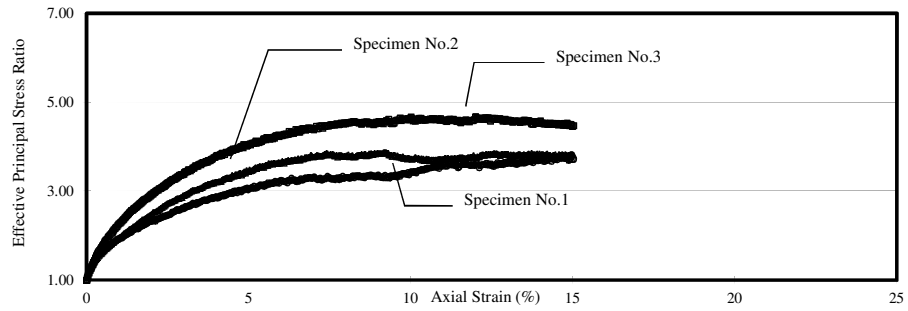
Project No.: S27-14 Sample No.: HP-1 Soil Type: Clay

Borehole No.: PP3-19-2 Depth :3.00-3.85m









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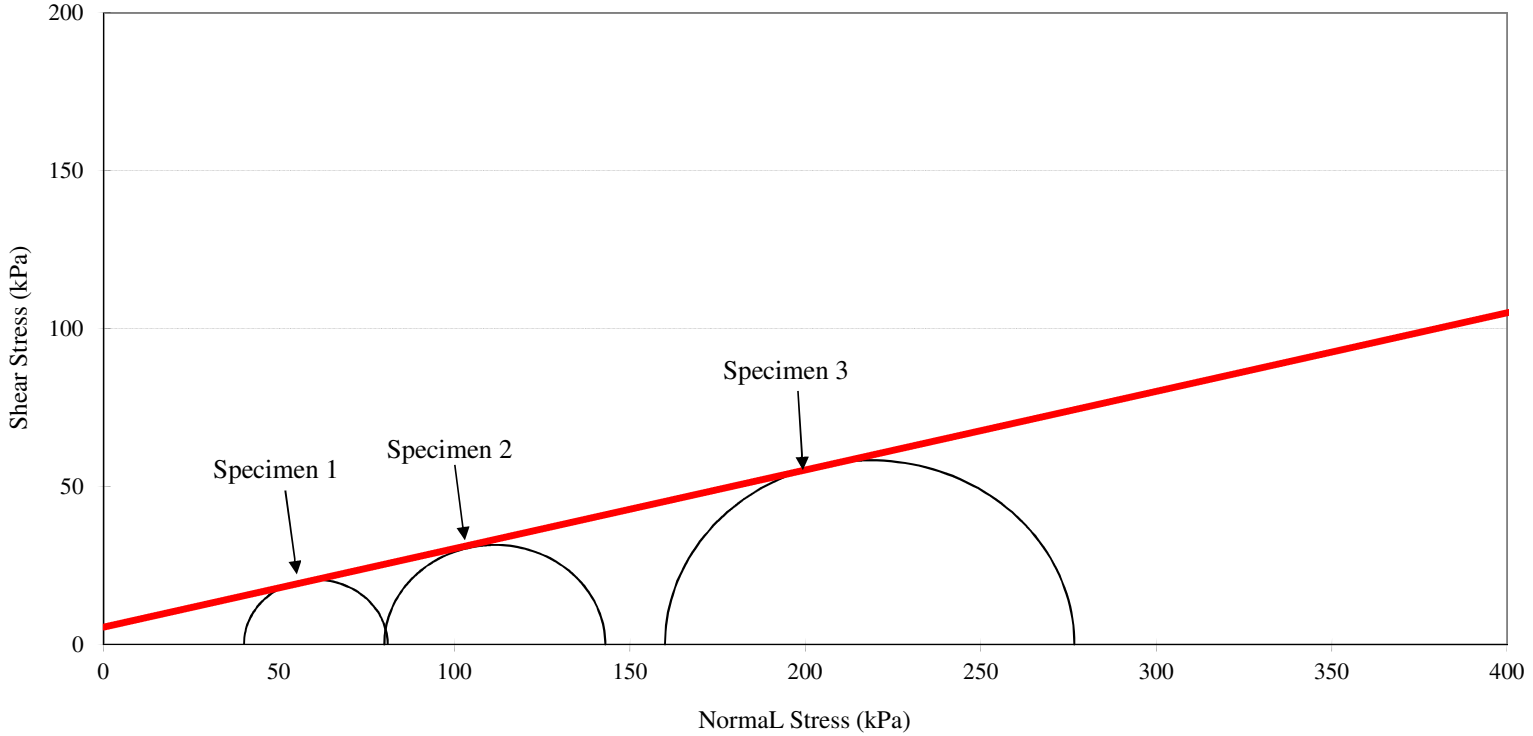
Consolidated Undrained Triaxial Compression Test
With Pore water Pressure Measurement
- Mohr' s Circle (In terms of Total Stress) -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14

Borehole No.: PP3-19-2 Soil Type: Clay
Sample No. : HP-1 Depth :3.00-3.85m
Angle of Internal Friction, ϕ 14 deg
Cohesion, c 6 kPa



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

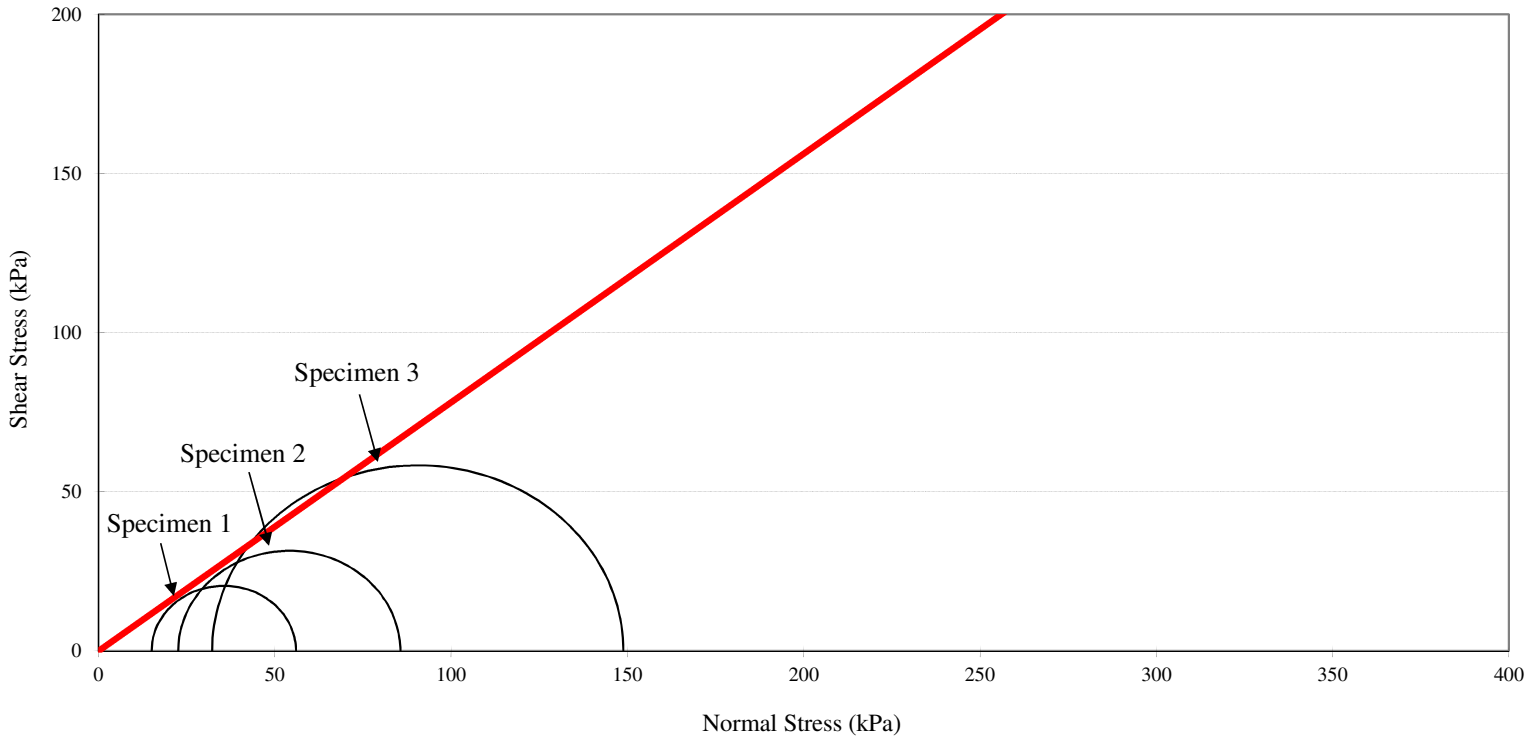
Project No. : S27-14

Borehole No.: PP3-19-2 Soil Type: Clay

Sample No. : HP-1 Depth :3.00-3.85m

Angle of Internal Friction, ϕ' 38 deg

Cohesion, c' 0 kPa

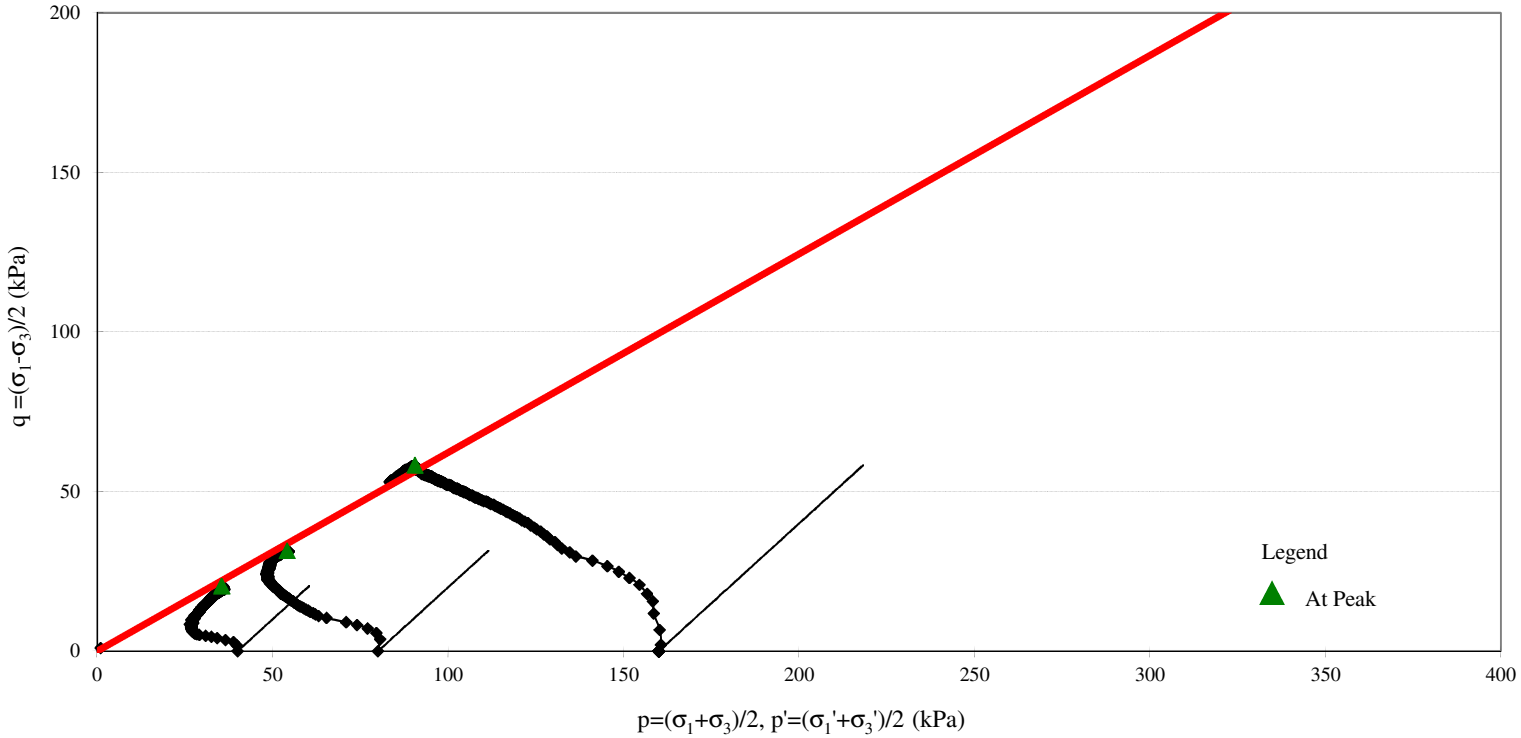


Consolidated Undrained Triaxial Compression Test
With Pore water Pressure Measurement
- Stress Path -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No. : S27-14

Borehole No.: PP3-19-2 Soil Type: Clay
Sample No. : HP-1 Depth :3.00-3.85m

α'	32	deg
a'	0	kPa



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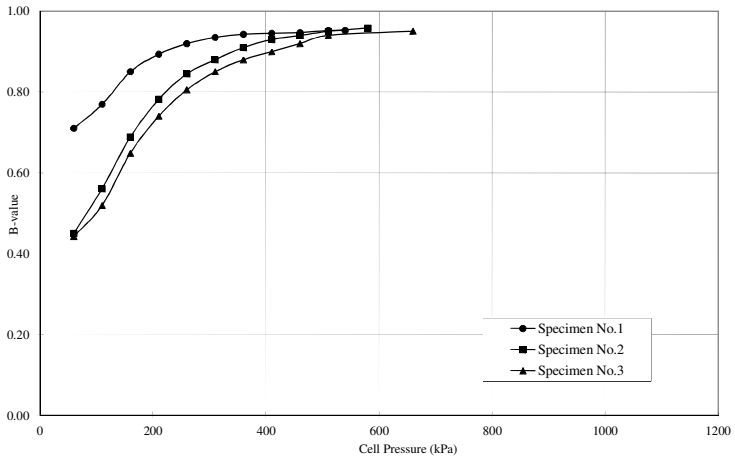
Consolidated Undrained Triaxial Compression Test
With Porewater Pressure Measurement
- B-value Check -

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14
Borehole No.: PP3-19-2 Depth : 3.00-3.85m
Sample No.: HP-1 Soil Type: 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	41.3	20	33.5	20	33.3
	Back Pressure (kPa)	20		20		20	
	B-value	0.71		0.45		0.44	
B-check Step.2	Cell Pressure (kPa)	60	110	60	110	60	110
	P.W.P (kPa)	50	88.5	50	78.1	50	76.0
	Back Pressure (kPa)	50		50		50	
	B-value	0.77		0.56		0.52	
B-check Step.3	Cell Pressure (kPa)	110	160	110	160	110	160
	P.W.P (kPa)	100	142.5	100	134.4	100	132.4
	Back Pressure (kPa)	100		100		100	
	B-value	0.85		0.69		0.65	
B-check Step.4	Cell Pressure (kPa)	160	210	160	210	160	210
	P.W.P (kPa)	150	194.7	150	189.1	150	187.0
	Back Pressure (kPa)	150		150		150	
	B-value	0.89		0.78		0.74	
B-check Step.5	Cell Pressure (kPa)	210	260	210	260	210	260
	P.W.P (kPa)	200	246.0	200	242.3	200	240.3
	Back Pressure (kPa)	200		200		200	
	B-value	0.92		0.85		0.81	
B-check Step.6	Cell Pressure (kPa)	260	310	260	310	260	310
	P.W.P (kPa)	250	296.8	250	294.0	250	292.5
	Back Pressure (kPa)	250		250		250	
	B-value	0.94		0.88		0.85	
B-check Step.7	Cell Pressure (kPa)	310	360	310	360	310	360
	P.W.P (kPa)	300	347.2	300	345.5	300	344.0
	Back Pressure (kPa)	300		300		300	
	B-value	0.94		0.91		0.88	
B-check Step.8	Cell Pressure (kPa)	360	410	360	410	360	410
	P.W.P (kPa)	350	397.3	350	396.5	350	395.0
	Back Pressure (kPa)	350		350		350	
	B-value	0.95		0.93		0.90	
B-check Step.9	Cell Pressure (kPa)	410	460	410	460	410	460
	P.W.P (kPa)	400	447.4	400	447.0	400	446.0
	Back Pressure (kPa)	400		400		400	
	B-value	0.95		0.94		0.92	
B-check Step.10	Cell Pressure (kPa)	460	510	460	510	460	510
	P.W.P (kPa)	450	497.6	450	497.5	450	497.0
	Back Pressure (kPa)	450		450		450	
	B-value	0.95		0.95		0.94	
B-check Step.11	Cell Pressure (kPa)	510	540	510	580	510	660
	P.W.P (kPa)	500	528.6	500	567.0	500	642.5
	Back Pressure (kPa)	500		500		500	
	B-value	0.95		0.96		0.95	



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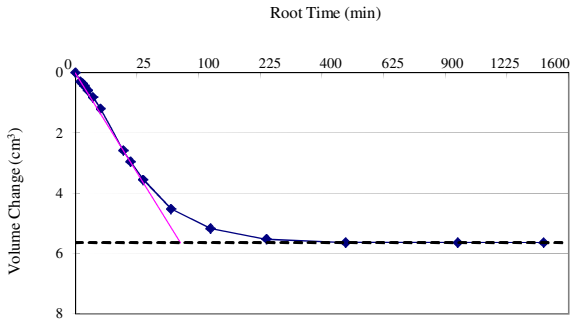
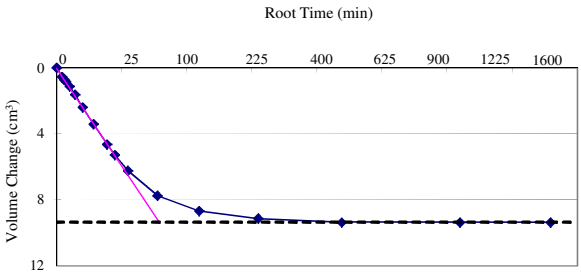
Consolidated Undrained Triaxial Compression Test
With Porewater Pressure Measurement
- Volume Change versus Root Time in Consolidation Stages

Project : Preparatory Survey on Matarbari USC Coral-fired Power Project
Project No.: S27-14 Sample No.: HP-1 Soil Type: Clay
Borehole No.: PP3-19-2 Depth : 3.00-3.85m



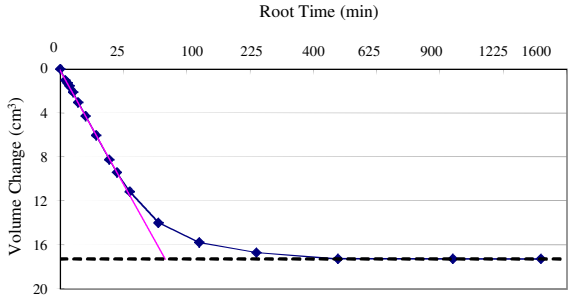
Specimen No.: 1

p' =	40	kPa
t100 =	72.5	min
Cv =	0.57	m^2/year
mvi=	0.72	m^2/MN



Specimen No.: 2

p' =	80	kPa
t100 =	62.1	min
Cv =	0.67	m^2/year
mvi=	0.59	m^2/MN



Specimen No.: 3

p' =	160	kPa
t100 =	68.3	min
Cv =	0.61	m^2/year
mvi=	0.54	m^2/MN

CONSOLIDATION TEST (e-log p curves)

Preparatory Survey on Matarbari USC Coal-fired Power

Project : Project

Project No.: S27-14 Tested by : Lim

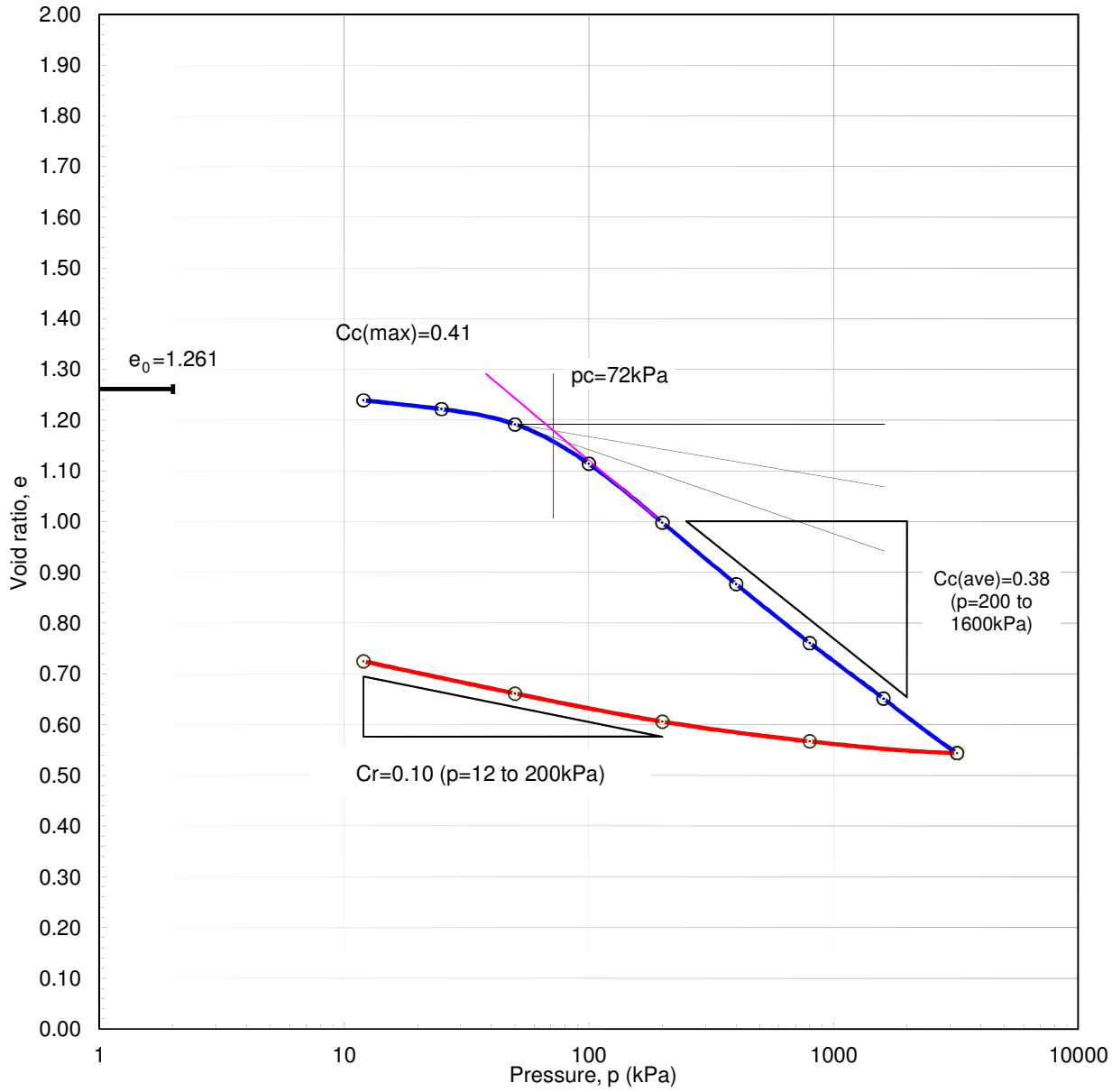
Soil Type : Clay Checked by : A. B. Tan

Borehole No. : PP3-19-2

Sample No. : HP-1

Depth of Sample : 3.00-3.85 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	3.00-3.85	1.261	72	0.41 (max)	0.38(average)	0.10 (average)	N/A



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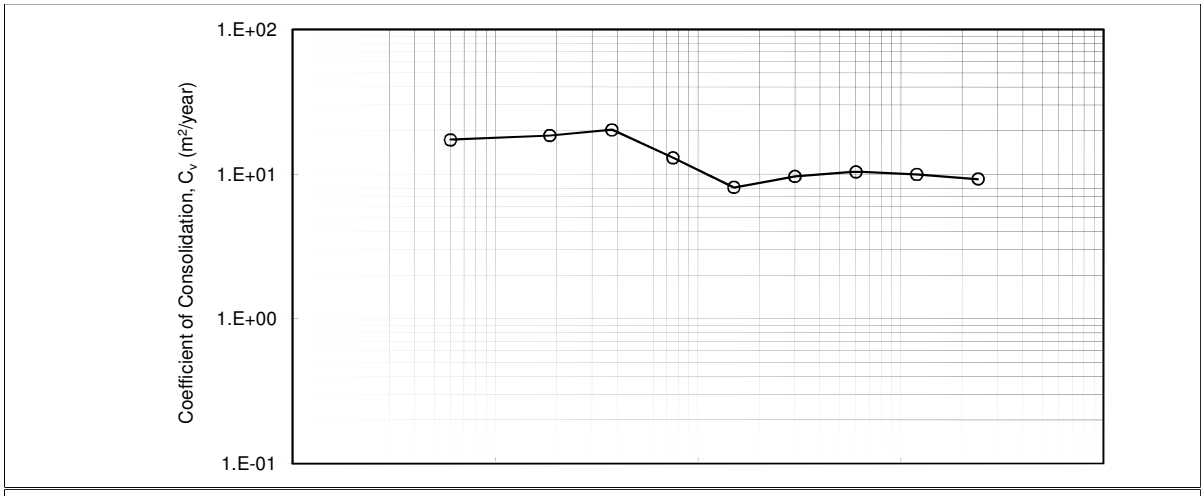
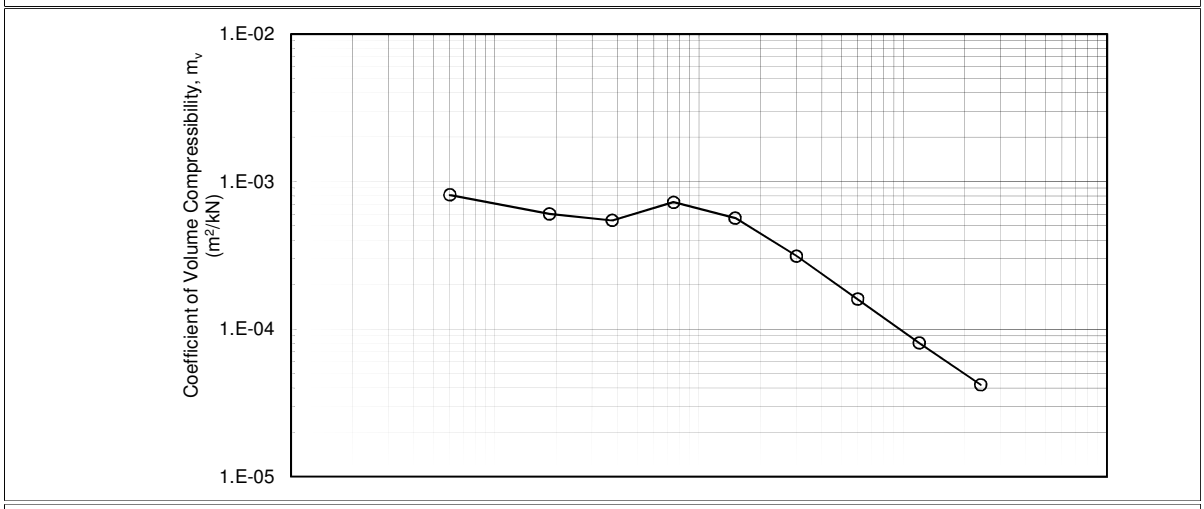
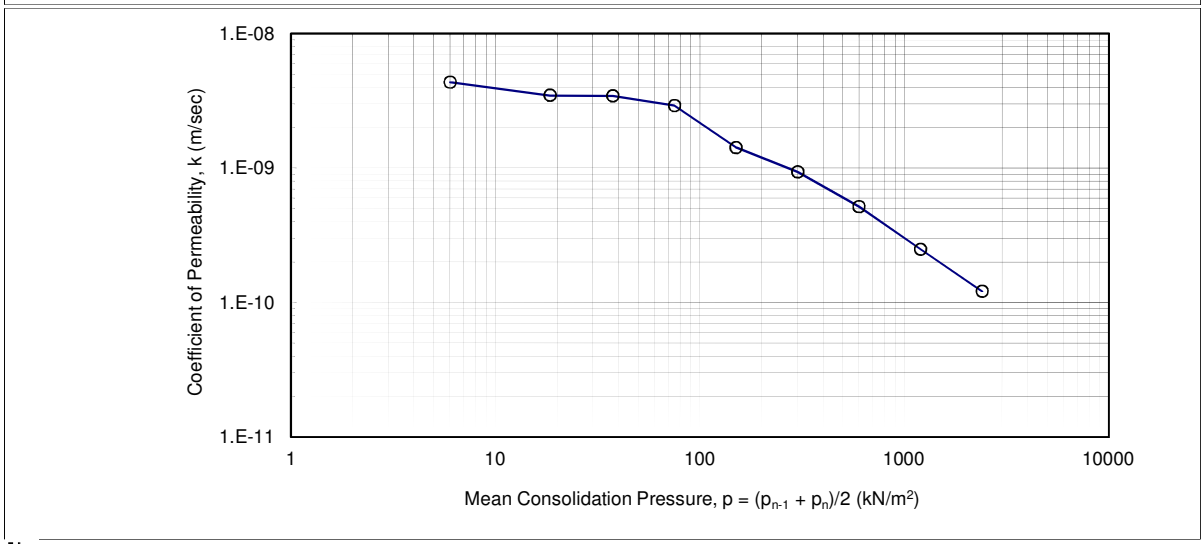
Consolidation Test (p - $\overline{cv}$, mv , k curves)

Project	:	Preparatory Survey on Matarbari USC Coal-fired Power Project		Borehole No. :	PP3-19-2
Project No.	:	S27-14		Sample No. :	HP-1
Date of testing	:	8-Oct-14	Tested by : Lim	Depth of Sample :	3.00-3.85 m







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PROJECT NAME : Preparatory Survey on Matarbari USC Coal-fired Power Project
PROJECT NO. : S27-14
BOREHOLE NO. : PP3-19-2
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 : 3.00-3.85 m
DIAMETER OF SPECIMEN : 53.900 mm
SPECIFIC GRAVITY : 2.74
TESTER NO. : 11
DRY WEIGHT OF SPECIMEN : 49.780 grams
SOLID HEIGHT OF SPECIMEN : 7.960 mm
INITIAL MOISTURE CONTENT : 43.6 %
BULK DENSITY : 1.74 Mg/m^3
METHOD OF TIME FITTING USED : SQUARE ROOT TIME CURVE - FITTING METHOD
LABORATORY TEMPERATURE : 23.0 ^{o}C

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				2.261	1.261
	12.000	17.4		17.913	0.97	8.09E-04		
12.000			17.826				2.239	1.239
	13.000	13.9		17.757	0.78	6.02E-04		
25.000			17.687				2.222	1.222
	25.000	23.9		17.568	1.36	5.44E-04		
50.000			17.448				2.192	1.192
	50.000	62.0		17.138	3.62	7.24E-04		
100.000			16.828				2.114	1.114
	100.000	92.4		16.366	5.65	5.65E-04		
200.000			15.904				1.998	0.998
	200.000	96.3		15.423	6.24	3.12E-04		
400.000			14.941				1.877	0.877
	400.000	92.3		14.480	6.37	1.59E-04		
800.000			14.018				1.761	0.761
	800.000	87.3		13.582	6.43	8.03E-05		
1600.000			13.145				1.651	0.651
	1600.000	85.4		12.718	6.71	4.20E-05		
3200.000			12.291				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	1.92	5.49E-07	4.74E-02	1.73E+01	8.9	0.512	4.36E-09
12.000								
	18.500	1.77	5.87E-07	5.07E-02	1.85E+01	5.7	0.407	3.47E-09
25.000								
	37.500	1.58	6.43E-07	5.56E-02	2.03E+01	3.6	0.276	3.43E-09
50.000								
	75.000	2.35	4.12E-07	3.56E-02	1.30E+01	13.0	0.179	2.92E-09
100.000								
	150.000	3.43	2.57E-07	2.22E-02	8.09E+00	48.2	0.521	1.42E-09
200.000								
	300.000	2.55	3.06E-07	2.64E-02	9.65E+00	50.7	0.526	9.37E-10
400.000								
	600.000	2.09	3.30E-07	2.85E-02	1.04E+01	46.1	0.500	5.16E-10
800.000								
	1200.000	1.92	3.16E-07	2.73E-02	9.96E+00	43.5	0.498	2.49E-10
1600.000								
	2400.000	1.81	2.94E-07	2.54E-02	9.26E+00	39.5	0.463	1.21E-10
3200.000								

REBOUND

P	800.000	200.000	50.000	12.000
H	12.476	12.785	13.227	13.731
E	0.567	0.606	0.662	0.725

CONSOLIDATION TEST (e-log p curves)

Preparatory Survey on Matarbari USC Coal-fired Power

Project : Project

Project No.: S27-14 Tested by : Lim

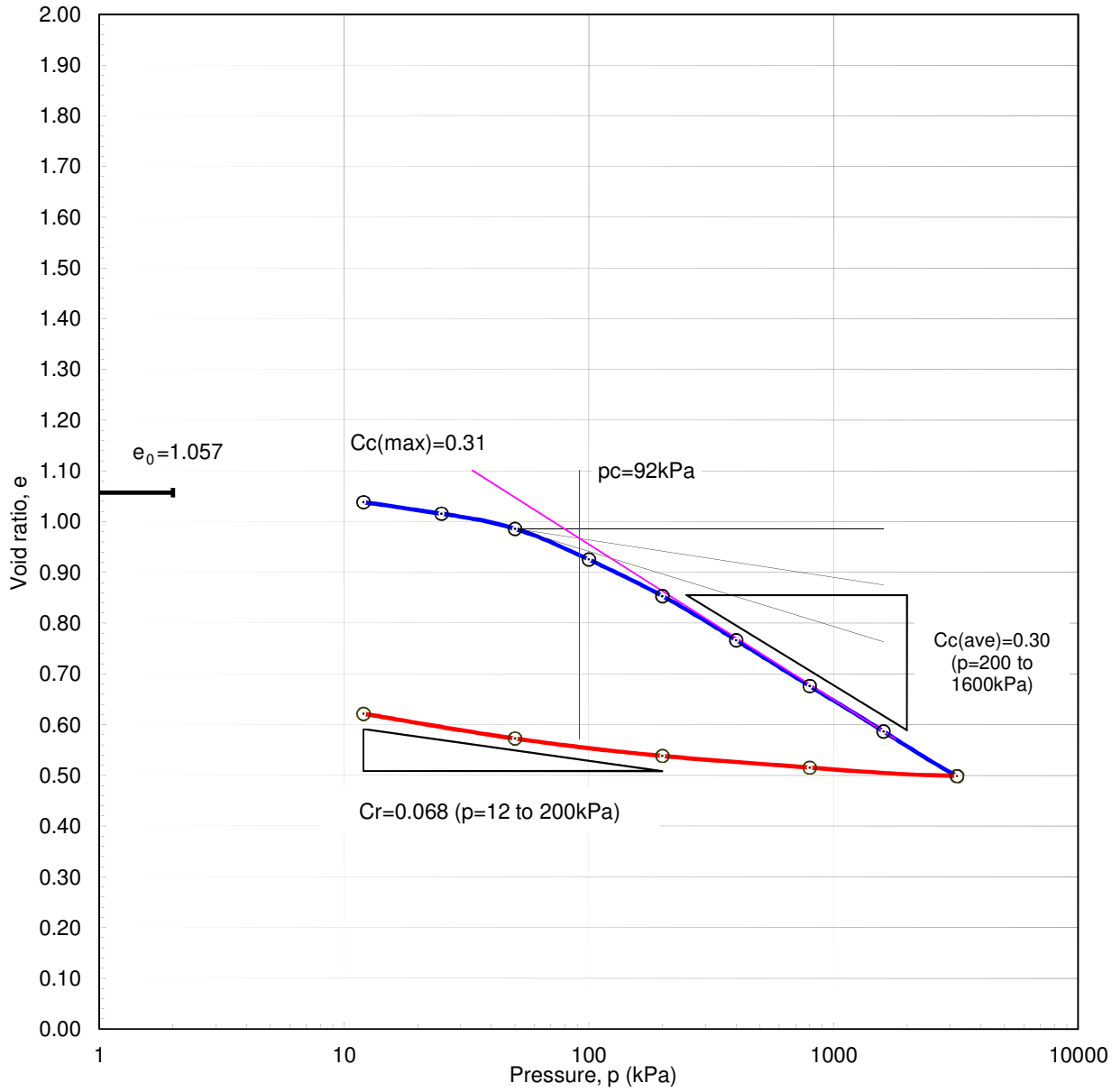
Soil Type : Clay Checked by : A. B. Tan

Borehole No. : PP3-19-2

Sample No. : HP-2

Depth of Sample : 6.00-6.90 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	6.00-6.90	1.057	92	0.31 (max)	0.30(average)	0.068 (average)	N/A



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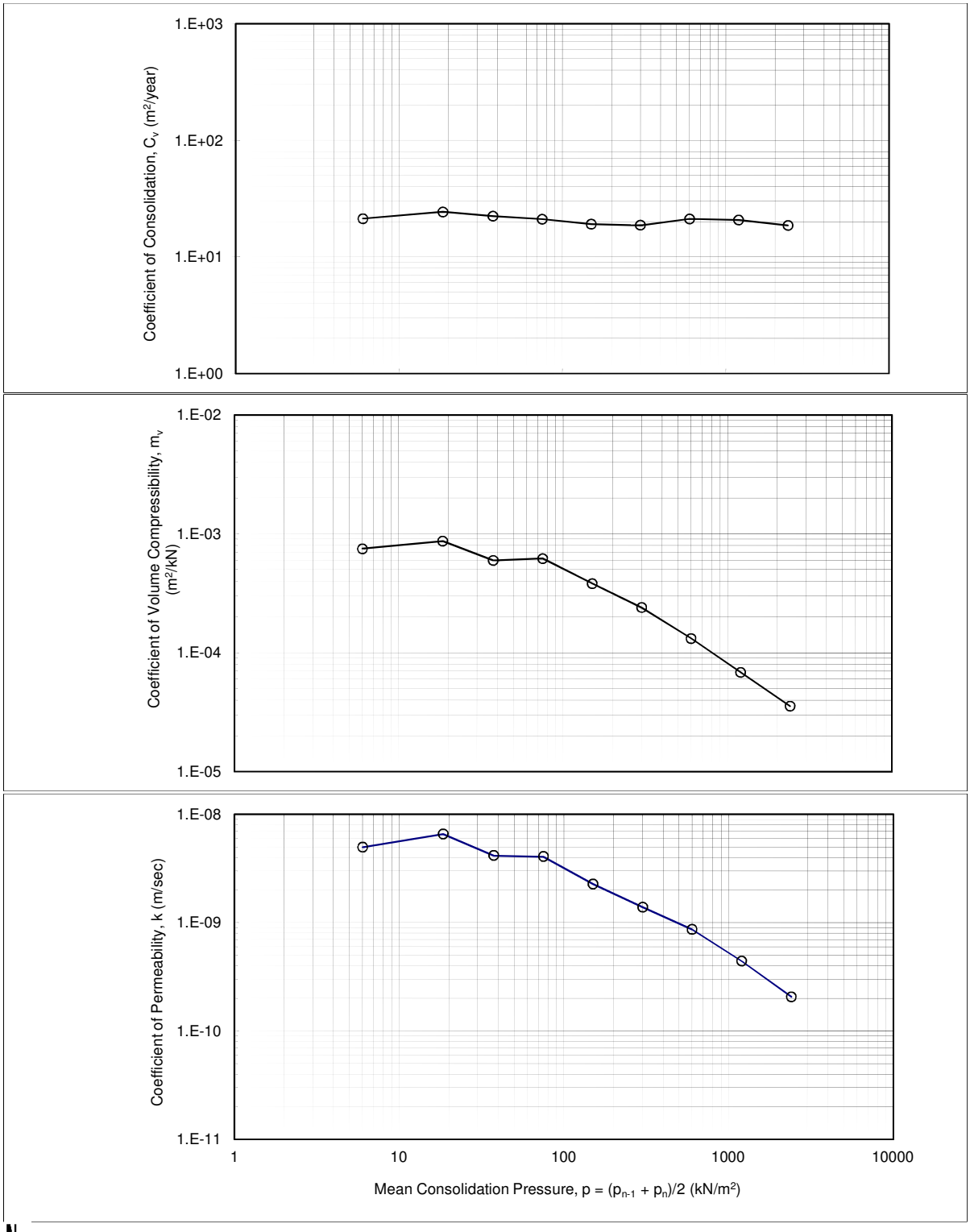
Consolidation Test (p - $\overline{cv}$, mv , k curves)

Project	:	Preparatory Survey on Matarbari USC Coal-fired Power Project		Borehole No. :	PP3-19-2
Project No.	:	S27-14		Sample No. :	HP-2
Date of testing	:	8-Oct-14	Tested by : Lim	Depth of Sample :	6.00-6.90 m



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PROJECT NAME : Preparatory Survey on Matarbari USC Coal-fired Power Project
PROJECT NO. : S27-14
BOREHOLE NO. : PP3-19-2
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 : 6.00-6.90 m
DIAMETER OF SPECIMEN : 53.900 mm
SPECIFIC GRAVITY : 2.74
TESTER NO. : 12
DRY WEIGHT OF SPECIMEN : 54.710 grams
SOLID HEIGHT OF SPECIMEN : 8.750 mm
INITIAL MOISTURE CONTENT : 36.4 %
BULK DENSITY : 1.84 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				2.057	1.057
	12.000	16.1		17.920	0.90	7.49E-04		
12.000			17.839				2.039	1.039
	13.000	20.0		17.739	1.13	8.67E-04		
25.000			17.639				2.016	1.016
	25.000	26.1		17.509	1.49	5.96E-04		
50.000			17.378				1.986	0.986
	50.000	53.0		17.113	3.10	6.19E-04		
100.000			16.848				1.925	0.925
	100.000	63.0		16.533	3.81	3.81E-04		
200.000			16.218				1.853	0.853
	200.000	75.9		15.839	4.79	2.40E-04		
400.000			15.459				1.767	0.767
	400.000	79.3		15.063	5.26	1.32E-04		
800.000			14.666				1.676	0.676
	800.000	78.1		14.276	5.47	6.84E-05		
1600.000			13.885				1.587	0.587
	1600.000	76.8		13.501	5.69	3.56E-05		
3200.000			13.117				1.499	0.499

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	1.56	6.76E-07	5.84E-02	2.13E+01	6.5	0.403	4.97E-09
12.000								
	18.500	1.34	7.72E-07	6.67E-02	2.43E+01	6.3	0.315	6.57E-09
25.000								
	37.500	1.42	7.11E-07	6.14E-02	2.24E+01	8.6	0.331	4.16E-09
50.000								
	75.000	1.44	6.69E-07	5.78E-02	2.11E+01	20.5	0.365	4.07E-09
100.000								
	150.000	1.48	6.06E-07	5.24E-02	1.91E+01	21.8	0.363	2.27E-09
200.000								
	300.000	1.39	5.93E-07	5.12E-02	1.87E+01	30.6	0.403	1.39E-09
400.000								
	600.000	1.11	6.71E-07	5.80E-02	2.12E+01	28.7	0.361	8.67E-10
800.000								
	1200.000	1.02	6.57E-07	5.68E-02	2.07E+01	25.7	0.329	4.41E-10
1600.000								
	2400.000	1.01	5.91E-07	5.11E-02	1.86E+01	24.1	0.314	2.06E-10
3200.000								

REBOUND

P	800.000	200.000	50.000	12.000
H	13.261	13.462	13.762	14.191
E	0.516	0.539	0.573	0.622

CONSOLIDATION TEST (e-log p curves)

Preparatory Survey on Matarbari USC Coal-fired Power

Project : Project

Project No.: S27-14 Tested by : Lim

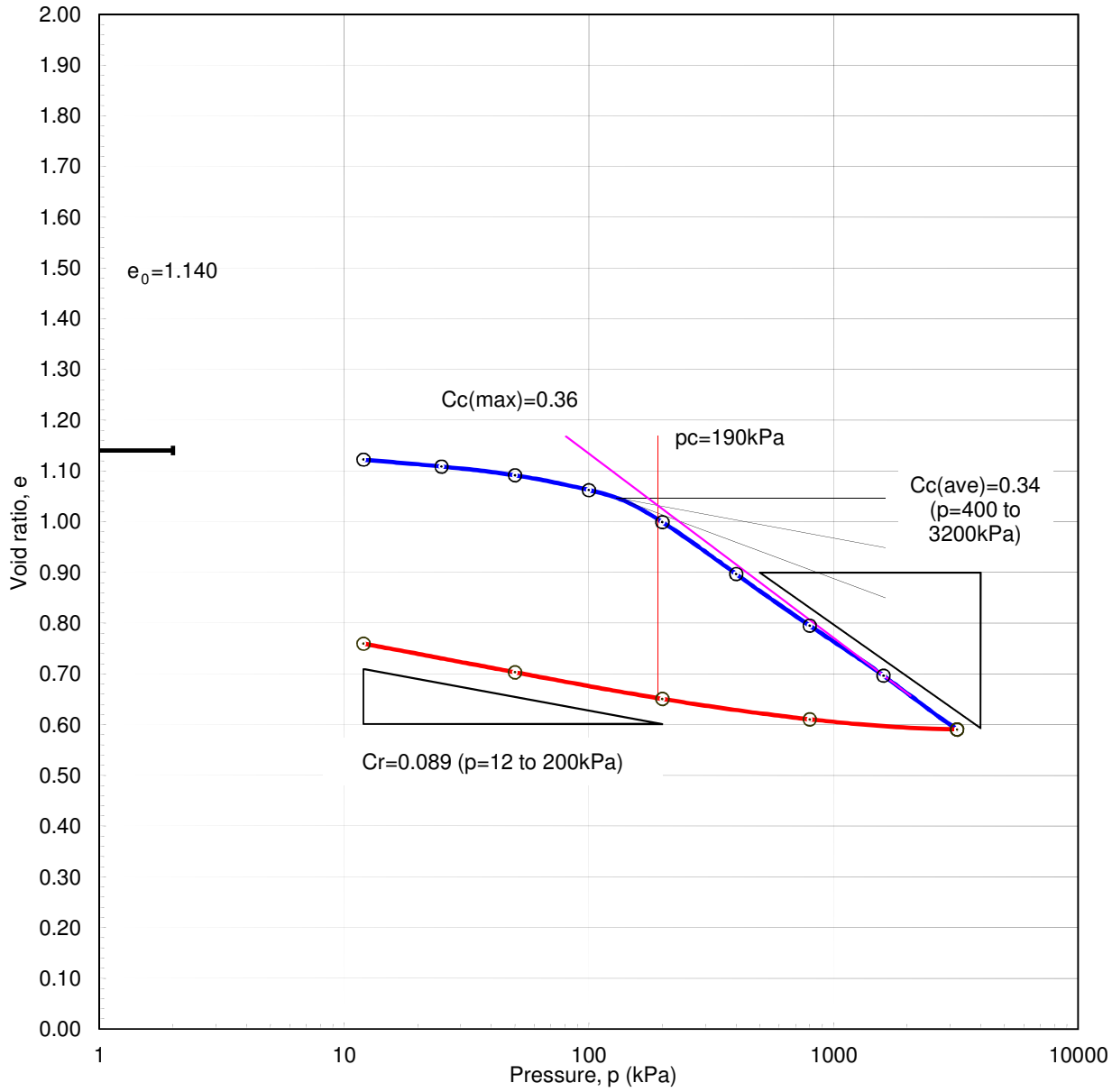
Soil Type : Clay Checked by : A. B. Tan

Borehole No. : PP3-19-2

Sample No. : HP-3

Depth of Sample : 13.00-13.85 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	13.00-13.85	1.140	190	0.36 (max)	0.34(average)	0.089 (average)	N/A



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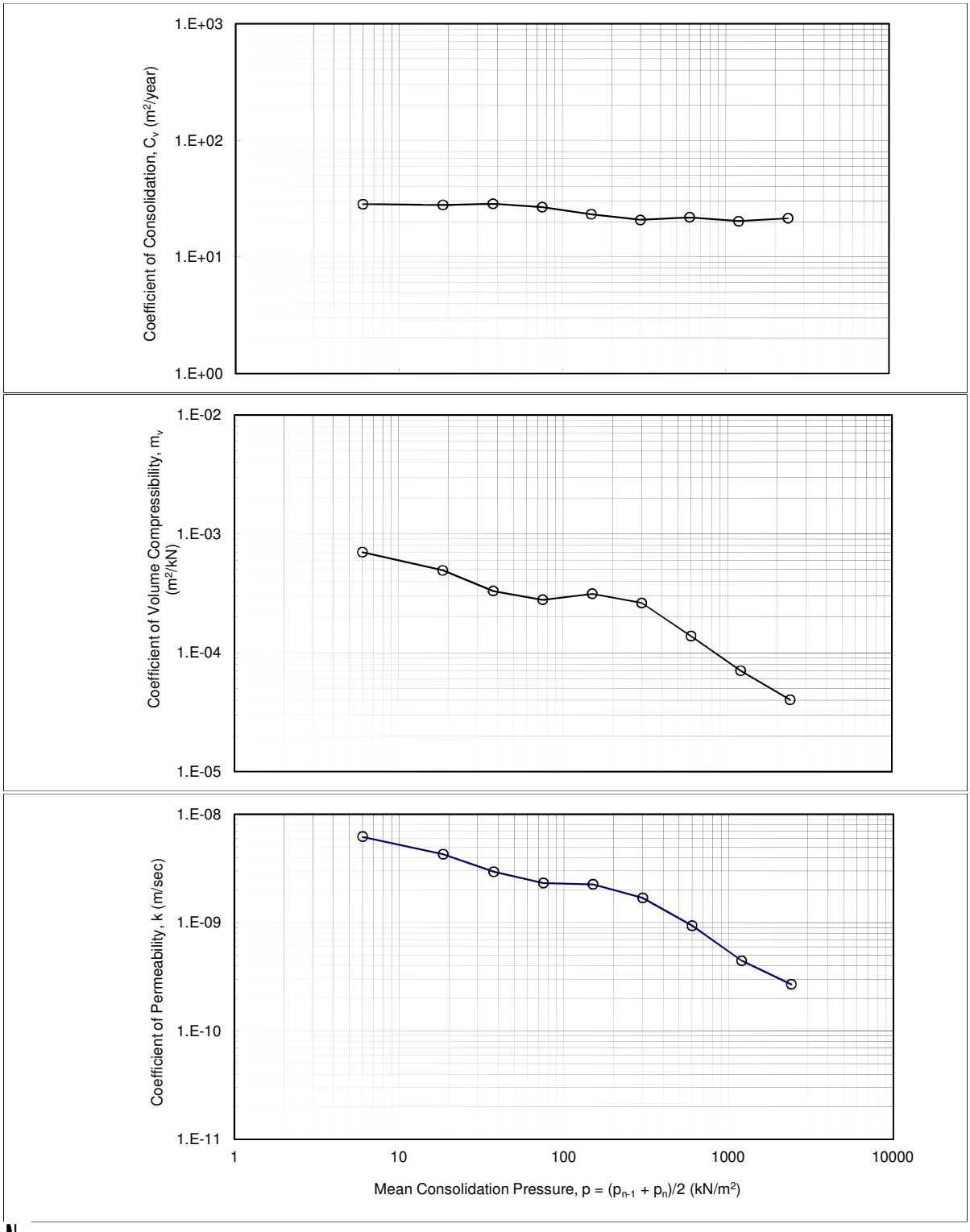
Consolidation Test (p - $\overline{cv}$, mv , k curves)

Project	:	Preparatory Survey on Matarbari USC Coal-fired Power Project		Borehole No.	: PP3-19-2
Project No.	:	S27-14		Sample No.	: HP-3
Date of testing	:	17-Nov-14	Tested by : Lim	Depth of Sample	: 13.00-13.85 m



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PROJECT NAME : Preparatory Survey on Matarbari USC Coal-fired Power Project
PROJECT NO. : S27-14
BOREHOLE NO. : PP3-19-2
TESTING STANDARD : ASTM D2435-11
DATE : 17-Nov-14
SAMPLE NO. : HP-3
INITIAL HEIGHT OF SPECIMEN : 18.000 mm
NO. OF LOADING STEP : 9
DEPTH : 13.00-13.85 m
DIAMETER OF SPECIMEN : 53.900 mm
SPECIFIC GRAVITY : 2.74
TESTER NO. : 27
DRY WEIGHT OF SPECIMEN : 52.610 grams
SOLID HEIGHT OF SPECIMEN : 8.410 mm
INITIAL MOISTURE CONTENT : 36.9 %
BULK DENSITY : 1.75 Mg/m^3
METHOD OF TIME FITTING USED : SQUARE ROOT TIME CURVE - FITTING METHOD
LABORATORY TEMPERATURE : 23.0 ^{o}C

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				2.140	1.140
	12.000	15.1		17.925	0.84	7.02E-04		
12.000			17.849				2.122	1.122
	13.000	11.4		17.792	0.64	4.93E-04		
25.000			17.735				2.109	1.109
	25.000	14.6		17.662	0.83	3.31E-04		
50.000			17.589				2.091	1.091
	50.000	24.3		17.468	1.39	2.78E-04		
100.000			17.346				2.063	1.063
	100.000	53.4		17.079	3.13	3.13E-04		
200.000			16.812				1.999	0.999
	200.000	85.9		16.383	5.24	2.62E-04		
400.000			15.953				1.897	0.897
	400.000	85.6		15.525	5.51	1.38E-04		
800.000			15.097				1.795	0.795
	800.000	82.9		14.683	5.65	7.06E-05		
1600.000			14.268				1.697	0.697
	1600.000	88.9		13.824	6.43	4.02E-05		
3200.000			13.379				1.591	0.591

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	1.17	9.00E-07	7.77E-02	2.84E+01	4.0	0.264	6.20E-09
12.000								
	18.500	1.18	8.85E-07	7.64E-02	2.79E+01	3.8	0.329	4.28E-09
25.000								
	37.500	1.13	9.08E-07	7.85E-02	2.86E+01	3.9	0.270	2.95E-09
50.000								
	75.000	1.18	8.48E-07	7.33E-02	2.68E+01	7.3	0.299	2.32E-09
100.000								
	150.000	1.30	7.37E-07	6.37E-02	2.33E+01	17.8	0.332	2.26E-09
200.000								
	300.000	1.34	6.58E-07	5.69E-02	2.08E+01	36.3	0.423	1.69E-09
400.000								
	600.000	1.14	6.94E-07	5.99E-02	2.19E+01	33.4	0.390	9.38E-10
800.000								
	1200.000	1.10	6.42E-07	5.55E-02	2.03E+01	30.4	0.366	4.45E-10
1600.000								
	2400.000	0.92	6.81E-07	5.89E-02	2.15E+01	29.2	0.328	2.69E-10
3200.000								

REBOUND

P	800.000	200.000	50.000	12.000
H	13.546	13.884	14.325	14.801
E	0.611	0.651	0.703	0.760

730

40) PP3-19-3

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TABLE SUMMARY OF SOIL TEST

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

Borehole No.			PP3-19-3								
Sample No.		HP-1	HP-2	HP-3							
Sample Depth		1.00m ~1.90m	4.00m ~4.85m	7.00m ~7.85m							
Condition of Sample			Undisturbed								
Natural Water Content	%	49.7	32.1	30.9							
Specific Gravity		2.73	2.72	2.70							
Wet Density	Mg/m^3	1.71	1.92	1.88							
Dry Density	Mg/m^3	1.14	1.45	1.44							
Natural Void Ratio		1.39	0.87	0.88							
Degree of Saturation	%	98	100	95							
Atterberg Limits	Liquid Limit, %	48	33	30							
	Plastic Limit, %	23	21	19							
	Plasticity Index, %	25	12	11							
Grain Size Analysis	Gravel, %	0	0	0							
	Sand, %	4	16	38							
	Silt, %	41	48	31							
	Clay & Colloid, %	55	36	31							
	Max. diameter, mm	4.75	0.425	0.850							
	Diam. at 60% mm	0.0065	0.025	0.068							
	Diam. at 10% mm	-	-	-							
Visual soil description		Clay	Clay with Sand	Sandy Clay							
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})	-	-	-							
	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

Checked by : A. B. Tan

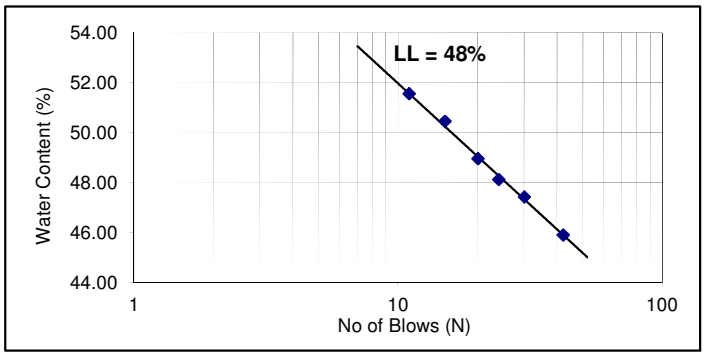
Kiso-Jiban Consultants Co., Ltd.

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 : 12.12.14
Tested By : Vasantha
Checked By : A. B. Tan

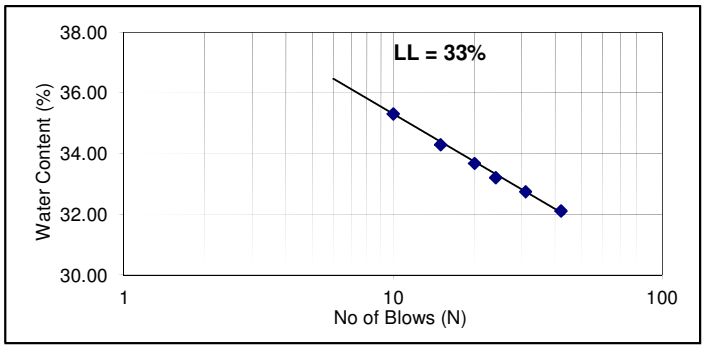
Sample No. : PP3-19-3 HP-1
Depth : 1.00-1.90m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	42	45.90
2	30	47.42
3	24	48.12
4	20	48.96
5	15	50.45
6	11	51.55
Liquid Limits %		**48**
Plastic Limits %		**23**
Plasticity Index		**25**



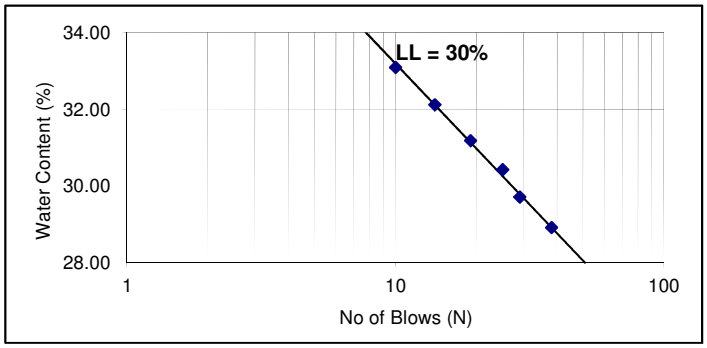
Sample No. : PP3-19-3 HP-2
Depth : 4.00-4.85m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	42	32.10
2	31	32.74
3	24	33.20
4	20	33.67
5	15	34.29
6	10	35.30
Liquid Limits %		**33**
Plastic Limits %		**21**
Plasticity Index		**12**



Sample No. : PP3-19-3 HP-3
Depth : 7.00-7.85m
Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	38	28.92
2	29	29.72
3	25	30.43
4	19	31.18
5	14	32.11
6	10	33.09
Liquid Limits %		**30**
Plastic Limits %		**19**
Plasticity Index		**11**



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Singapore Branch

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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**

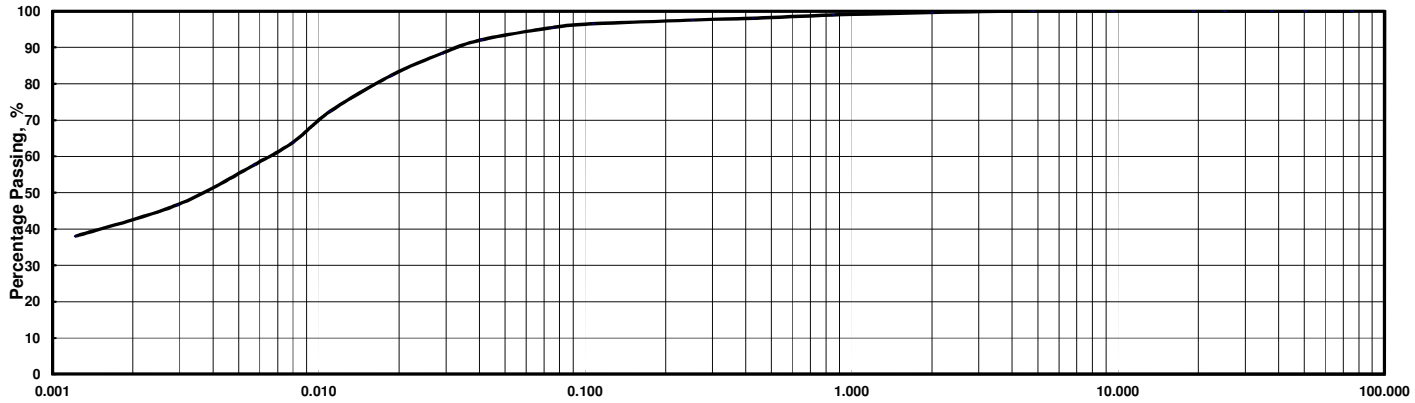
Sample No. : **PP3-19-3 HP-1** Depth : **1.00-1.90m** ( ) Specific Gravity : 2.73

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	99.6	98.9	98.0	97.5	96.5	95.5
Hydro.	Dia., mm	0.040	0.029	0.019	0.011	0.0080	0.0057	0.0029	0.0012							
	% Passing	92.0	88.4	82.2	72.4	63.8	57.7	46.6	38.0							

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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. Depth	PP3-19-3 HP-1 1.00-1.90m		Sample No. Depth	PP3-19-3 HP-1 1.00-1.90m	
Larger than 4.75 mm	0.0 %		Max. Diameter	4.75 mm	
4.75 - 2.00 mm	0.4 %		Dia. at 60%	0.0065 mm	
2.00 - 0.425 mm	1.6 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	2.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	40.6 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	54.9 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	98.9 %				
75um Sieve Passing	95.5 %				

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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**

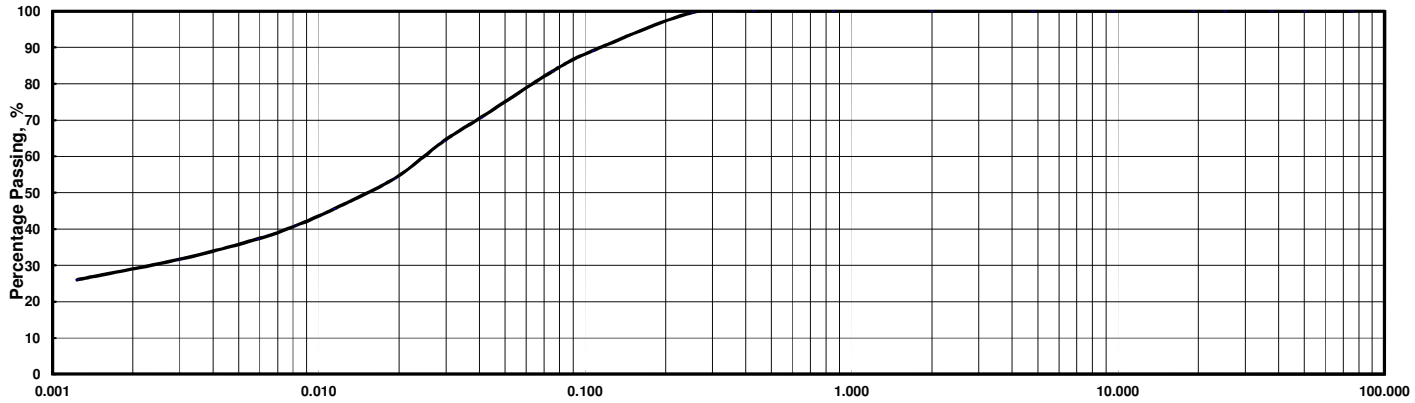
Sample No. : **PP3-19-3 HP-2** Depth : **4.00-4.85m** ( ) Specific Gravity : 2.72

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	100.0	99.5	89.0	83.4
Hydro.	Dia., mm	0.040	0.029	0.019	0.011	0.0082	0.0059	0.0030	0.0012							
	% Passing	70.7	64.2	54.0	45.6	40.9	37.2	31.6	26.1							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-19-3 HP-2 4.00-4.85m		Sample No. Depth	PP3-19-3 HP-2 4.00-4.85m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.425 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.025 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	0.0023 mm	
0.425 - 0.075 mm	16.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	47.8 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	35.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	83.4 %				

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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**

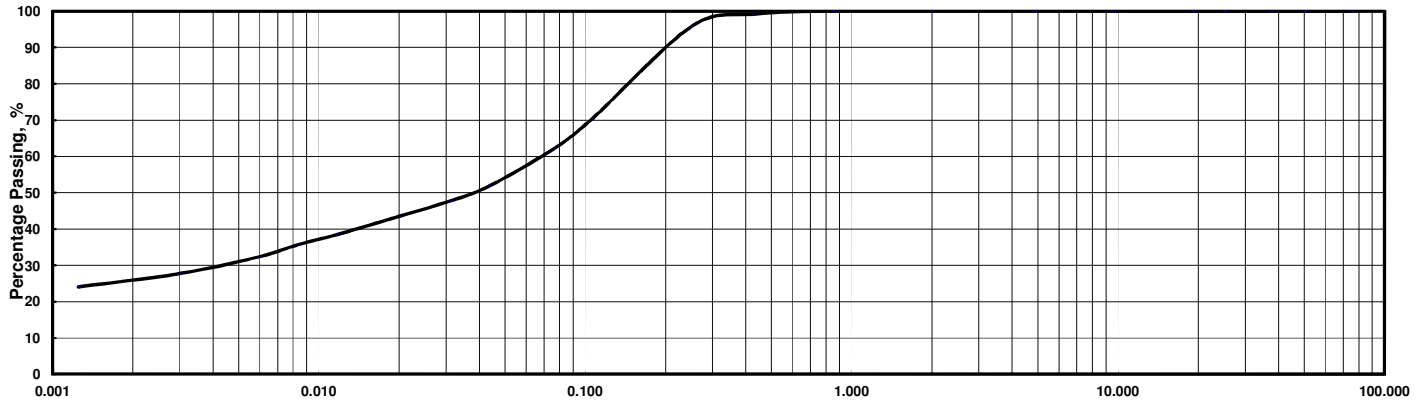
Sample No. : **PP3-19-3 HP-3** Depth : **7.00-7.85m** ( ) Specific Gravity : 2.70

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	99.1	95.8	70.3	61.8
Hydro.	Dia., mm	0.043	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0012							
	% Passing	51.8	47.8	43.5	38.5	35.7	32.4	27.8	24.1							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-19-3 HP-3 7.00-7.85m		Sample No. Depth	PP3-19-3 HP-3 7.00-7.85m	
Larger than 4.75 mm	0.0	%	Max. Diameter	0.850	mm
4.75 - 2.00 mm	0.0	%	Dia. at 60%	0.068	mm
2.00 - 0.425 mm	0.9	%	Dia. at 30%	0.0042	mm
0.425 - 0.075 mm	37.3	%	Dia. at 10%	-	mm
0.075 - 0.005 mm	31.0	%	Coeff. of Uniformity	-	
Smaller than 0.005 mm	30.9	%	Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%			
425um Sieve Passing	100.0	%			
75um Sieve Passing	61.8	%			

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41) PP3-23-1

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TABLE SUMMARY OF SOIL TEST

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

Borehole No.		PP3-23-1									
Sample No.		HP-1	HP-2	D-1							
Sample Depth		1.00m ~1.85m	4.00m ~4.85m	7.00m ~7.85m							
Condition of Sample		Undisturbed		Disturbed							
Natural Water Content	%	46.6	29.3	22.5							
Specific Gravity		2.76	2.72	2.72							
Wet Density	Mg/m^3	1.72	1.93	-							
Dry Density	Mg/m^3	1.17	1.49	-							
Natural Void Ratio		1.36	0.82	-							
Degree of Saturation	%	95	97	-							
Atterberg Limits	Liquid Limit, %	53	- *3	- *3							
	Plastic Limit, %	25	- *3	- *3							
	Plasticity Index, %	28	- *3	- *3							
Grain Size Analysis	Gravel, %	0	0	0							
	Sand, %	2	21	69							
	Silt, %	43	49	13							
	Clay & Colloid, %	55	30	18							
	Max. diameter, mm	0.106	0.850	0.850							
	Diam. at 60% mm	0.0063	0.036	0.15							
	Diam. at 10% mm	-	-	-							
Visual soil description		Clay	Clay with Sand	Clayey Sand							
Unified soil classification		CH	-	-							
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

Checked by : A. B. Tan

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ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project Project No. : S27-14

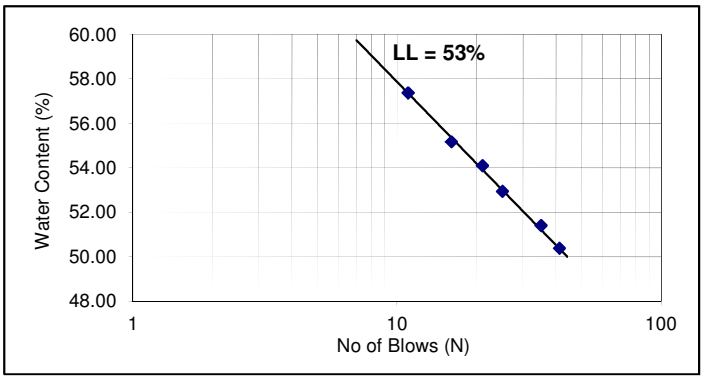
Standard : ASTM D4318-10 Date of Testing : 08.12.14

Tested By : Vasantha Checked By : A. B. Tan

Sample No. : PP3-23-1 HP-1 Depth : 1.00-1.85m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	41	50.38
2	35	51.41
3	25	52.94
4	21	54.09
5	16	55.17
6	11	57.35
Liquid Limits %		**53**
Plastic Limits %		**25**
Plasticity Index		**28**



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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 : **08.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

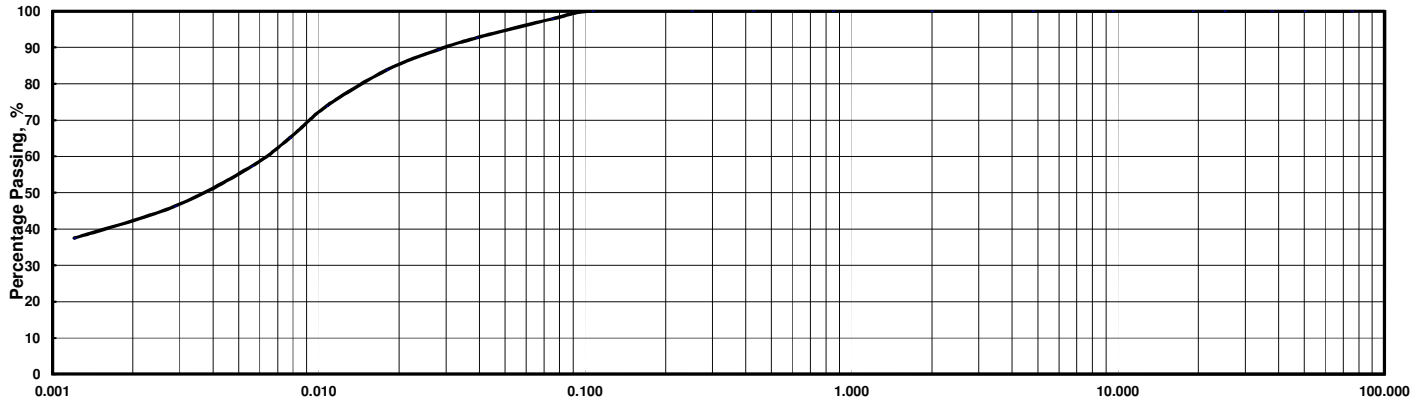
Sample No. : **PP3-23-1 HP-1** Depth : **1.00-1.85m** ( ) Specific Gravity : 2.76

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	97.9
Hydro.	Dia., mm	0.039	0.028	0.018	0.011	0.0078	0.0056	0.0029	0.0012							
	% Passing	92.6	89.3	83.8	73.9	65.1	57.3	46.3	37.5							

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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. Depth	PP3-23-1 HP-1 1.00-1.85m		Sample No. Depth	PP3-23-1 HP-1 1.00-1.85m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.106 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.0063 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	2.1 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	43.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	54.9 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	97.9 %				

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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 : **08.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

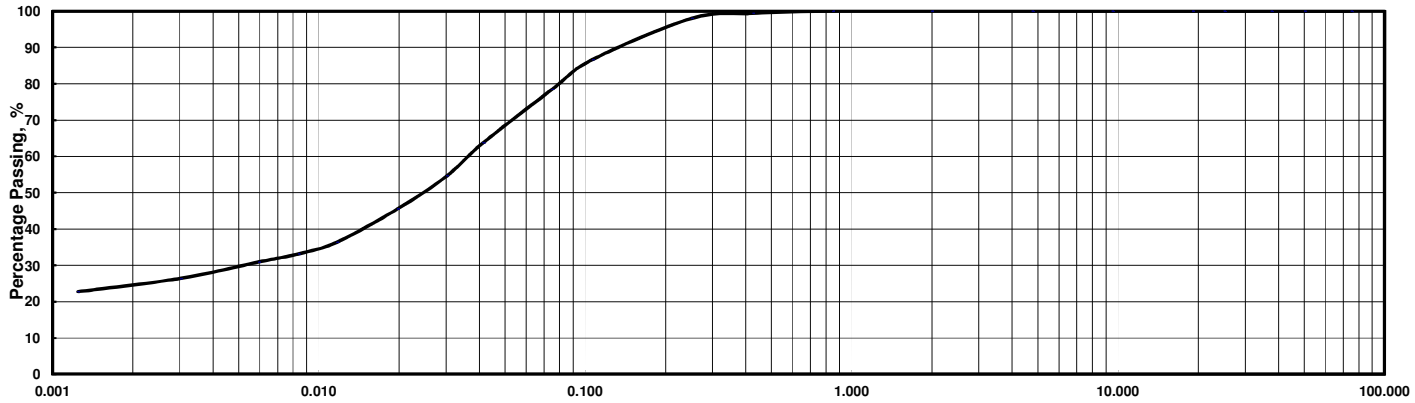
Sample No. : **PP3-23-1 HP-2** Depth : **4.00-4.85m** ( ) Specific Gravity : 2.72

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	99.4	98.0	86.6	78.5
Hydro.	Dia., mm	0.041	0.030	0.020	0.012	0.0084	0.0059	0.0030	0.0012							
	% Passing	63.7	54.6	45.5	36.4	33.1	31.0	26.4	22.8							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-23-1 HP-2 4.00-4.85m		Sample No. Depth	PP3-23-1 HP-2 4.00-4.85m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.036 mm	
2.00 - 0.425 mm	0.6 %		Dia. at 30%	0.0052 mm	
0.425 - 0.075 mm	20.9 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	49.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	29.5 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	78.5 %				

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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 : **08.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

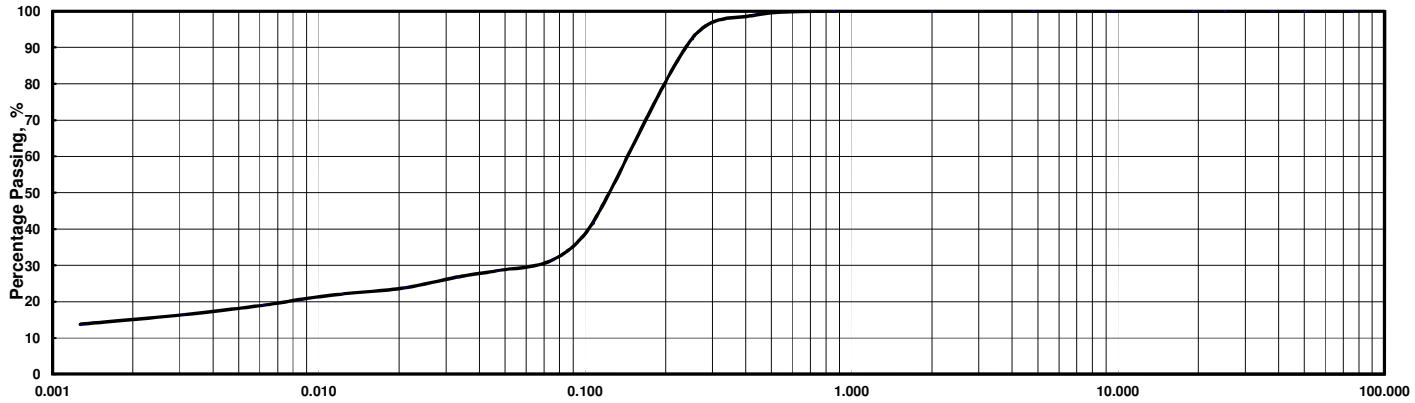
Sample No. : **PP3-23-1 D-1** Depth : **7.00-7.85m** ( ) Specific Gravity : 2.72

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	98.8	92.2	41.5	31.4
Hydro.	Dia., mm	0.046	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	28.5	26.8	23.8	22.1	20.7	19.0	16.4	13.8							

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	FINE	COARSE
		SAND			GRAVEL	

Sample No. Depth	PP3-23-1 D-1 7.00-7.85m		Sample No. Depth	PP3-23-1 D-1 7.00-7.85m	
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%	0.059 mm	
0.425 - 0.075 mm	67.4 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	13.4 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	18.0 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	31.4 %				

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42) PP3-23-2

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TABLE SUMMARY OF SOIL TEST

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

Borehole No.		PP3-23-2								
Sample No.		HP-1	HP-2	D-1	D-2					
Sample Depth		2.00m ~2.55m	5.00m ~5.80m	8.00m ~8.60m	11.00m ~11.85m					
Condition of Sample		Undisturbed		Disturbed						
Natural Water Content	%	36.0	29.7	30.9	30.7					
Specific Gravity		2.73	2.71	2.70	2.71					
Wet Density	Mg/m^3	1.90	1.93	1.91	1.94					
Dry Density	Mg/m^3	1.40	1.49	1.46	1.49					
Natural Void Ratio		0.95	0.82	0.85	0.82					
Degree of Saturation	%	100	98	98	100					
Atterberg Limits	Liquid Limit, %	37	28	- *3	- *3					
	Plastic Limit, %	21	19	- *3	- *3					
	Plasticity Index, %	16	9	- *3	- *3					
Grain Size Analysis	Gravel, %	0	0	0	0					
	Sand, %	15	47	58	60					
	Silt, %	47	26	20	16					
	Clay & Colloid, %	38	27	22	24					
	Max. diameter, mm	2.00	2.00	0.850	0.850					
	Diam. at 60% mm	0.023	0.10	0.11	0.13					
	Diam. at 10% mm	-	-	-	-					
Visual soil description		Silty Clay	Sandy Clay	Clayey Sand	Clayey Sand					
Unified soil classification		CL	CL	-	-					
Triaxial compression test	Angle of Internal Friction (^{0})	0	0	-	-					
	Cohesion Intercept, kPa	18	44	-	-					
	Condition of drainage	UU	UU	-	-					
	Angle of Internal Friction *2 (^{0})	-	-	-	-					
	Cohesion Intercept, kPa *2	-	-	-	-					
	Condition of drainage	-	-	-	-					
Consolidation Test	Preconsolidation Pressure, kPa	420	-	-	-					
	Compression Index(Average)	0.26	0.19	-	-					
	Pressure Range for Compression Index(kPa)	800-3200	1600-3200	-	-					
	Swell index	0.060	0.027	-	-					
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

Checked by : A. B. Tan

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ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project Project No. : S27-14

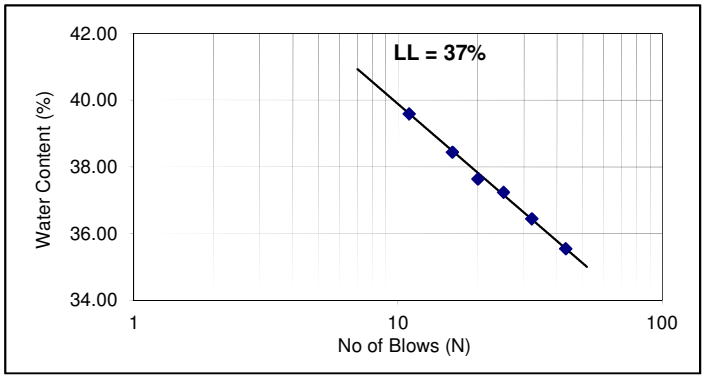
Standard : ASTM D4318-10 Date of Testing : 22.11.14

Tested By : Vasantha Checked By : A. B. Tan

Sample No. : PP3-23-2 HP-1 Depth : 2.00-2.55m

Remarks : Tested on material at natural state

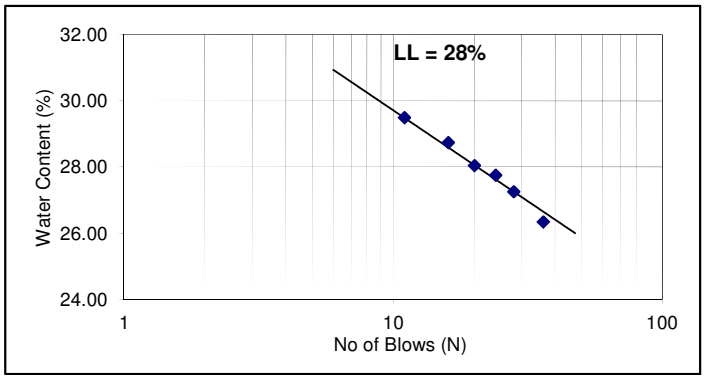
Liquid Limits Test		
Test No.	Blows	Wn
1	43	35.55
2	32	36.44
3	25	37.24
4	20	37.64
5	16	38.44
6	11	39.59
Liquid Limits %		**37**
Plastic Limits %		**21**
Plasticity Index		**16**



Sample No. : PP3-23-2 HP-2 Depth : 5.00-5.80m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	36	26.35
2	28	27.25
3	24	27.76
4	20	28.05
5	16	28.74
6	11	29.49
Liquid Limits %		**28**
Plastic Limits %		**19**
Plasticity Index		**9**



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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**

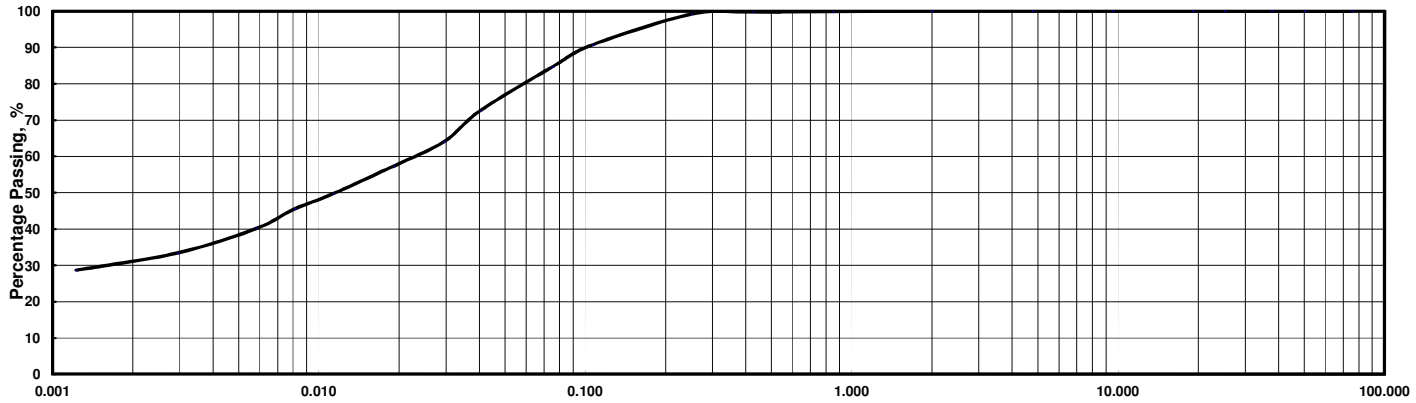
Sample No. : **PP3-23-2 HP-1** Depth : **2.00-2.55m** ( ) Specific Gravity : 2.73

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	99.8	99.7	99.2	90.7	84.6
Hydro.	Dia., mm	0.040	0.029	0.019	0.011	0.0081	0.0058	0.0030	0.0012							
	% Passing	72.6	64.0	57.4	49.7	45.5	40.1	33.5	28.7							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-23-2 HP-1 2.00-2.55m			Sample No. Depth	PP3-23-2 HP-1 2.00-2.55m	
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	0.3	%		Dia. at 30%	0.0016	mm
0.425 - 0.075 mm	15.1	%		Dia. at 10%	-	mm
0.075 - 0.005 mm	46.4	%		Coeff. of Uniformity	-	
Smaller than 0.005 mm	38.3	%		Coeff. of Curvature	-	
2000um Sieve Passing	100.0	%				
425um Sieve Passing	99.8	%				
75um Sieve Passing	84.6	%				

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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**

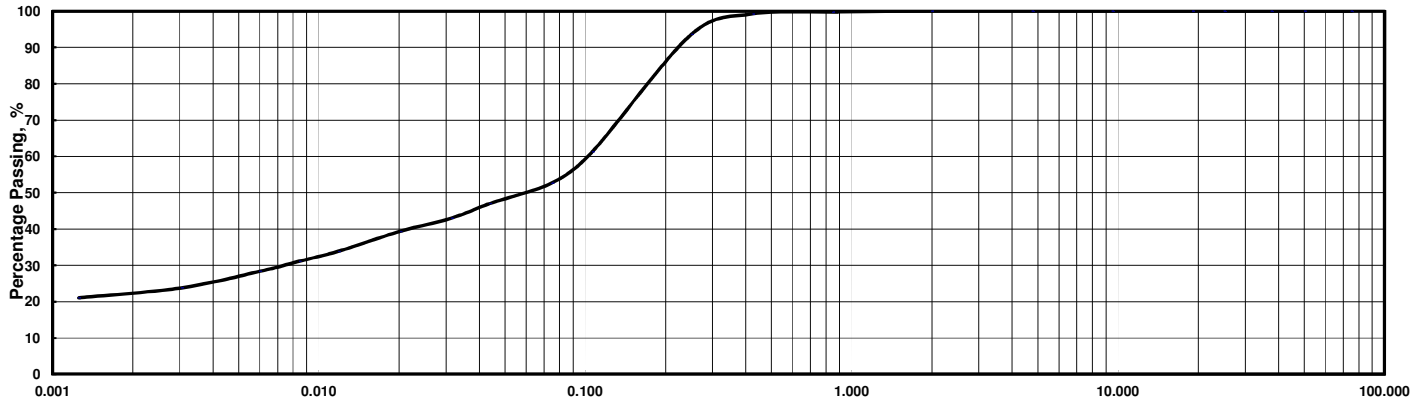
Sample No. : **PP3-23-2 HP-2** Depth : **5.00-5.80m** ( ) Specific Gravity : 2.71

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	99.7	99.2	93.6	61.2	52.7
Hydro.	Dia., mm	0.044	0.031	0.020	0.012	0.0084	0.0060	0.0030	0.0013							
	% Passing	47.1	43.0	39.4	33.9	31.1	28.4	23.8	21.1							

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	PP3-23-2 HP-2 5.00-5.80m		Sample No. Depth	PP3-23-2 HP-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%	0.10 mm	
2.00 - 0.425 mm	0.8 %		Dia. at 30%	0.0073 mm	
0.425 - 0.075 mm	46.5 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	25.9 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	26.8 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.7 %				
75um Sieve Passing	52.7 %				

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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**

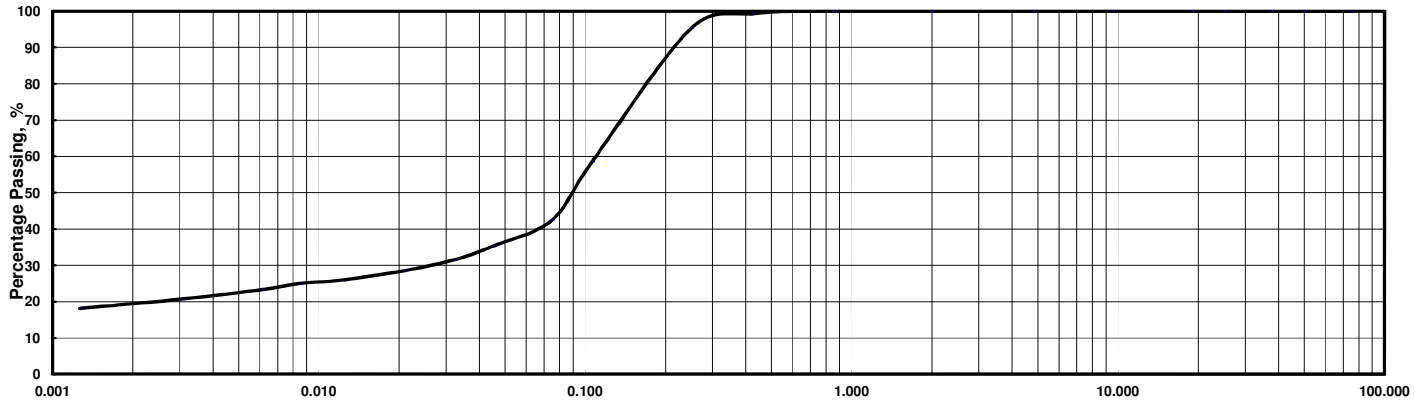
Sample No. : **PP3-23-2 D-1** Depth : **8.00-8.60m** ( ) Specific Gravity : 2.70

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	99.3	95.4	58.6	42.5
Hydro.	Dia., mm	0.045	0.033	0.021	0.012	0.0086	0.0061	0.0031	0.0013							
	% Passing	35.4	31.6	28.5	25.9	25.1	23.3	20.7	18.1							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-23-2 D-1 8.00-8.60m		Sample No. Depth	PP3-23-2 D-1 8.00-8.60m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.850 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.11 mm	
2.00 - 0.425 mm	0.7 %		Dia. at 30%	0.026 mm	
0.425 - 0.075 mm	56.8 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	20.1 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	22.4 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	42.5 %				

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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**

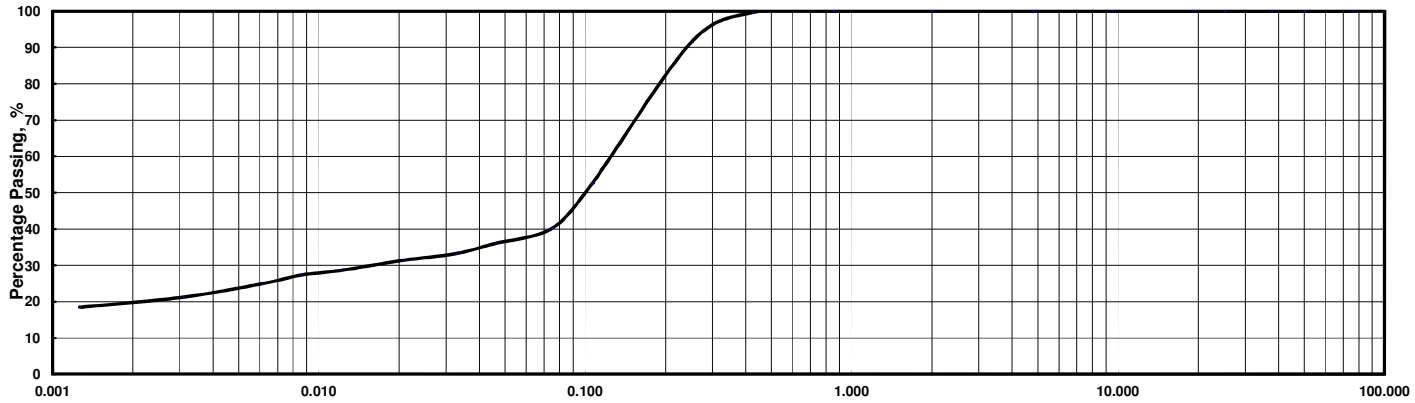
Sample No. : **PP3-23-2 D-2** Depth : **11.00-11.85m** ( ) Specific Gravity : 2.71

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	99.6	91.5	52.5	40.2
Hydro.	Dia., mm	0.046	0.032	0.021	0.012	0.0085	0.0061	0.0031	0.0013							
	% Passing	36.0	33.2	31.4	28.6	27.3	24.9	21.2	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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-23-2 D-2 11.00-11.85m		Sample No. Depth	PP3-23-2 D-2 11.00-11.85m	
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	0.4 %		Dia. at 30%	0.016 mm	
0.425 - 0.075 mm	59.4 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	16.6 %		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	40.2 %				

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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 : 20.11.14

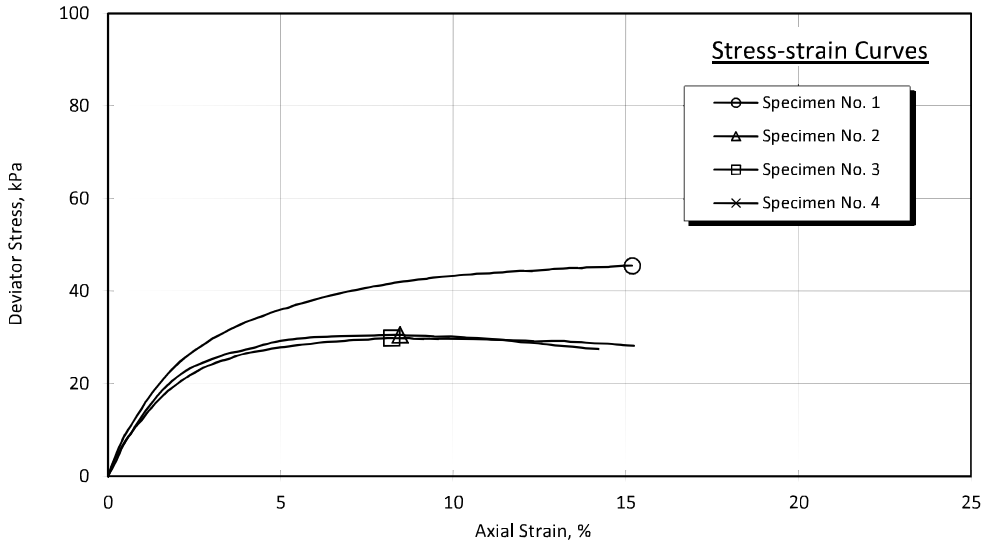
Borehole No.: PP3-23-2 Depth 2.00-2.55m

Tested by : Perera

Sample No. : HP-1 Strain Rate 1.00 %/min

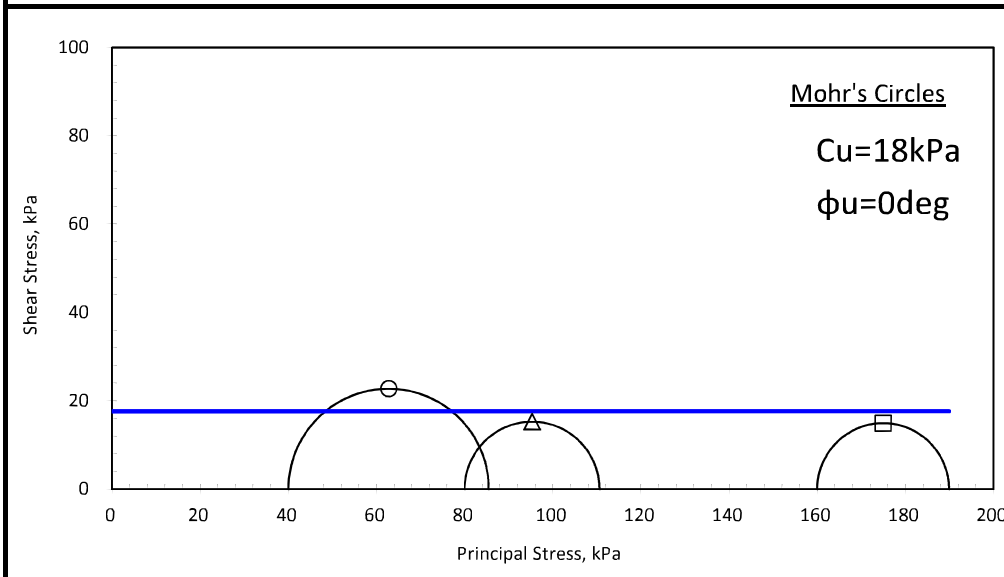
Checked by : A. B. Tan

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	33.3	1.87	1.40	40	45.4	1259	N/A	15.18
2	Undisturbed	99.80	50.00	36.8	1.84	1.34	80	30.5	1268	N/A	8.46
3	Undisturbed	99.80	50.00	38.5	1.81	1.31	160	29.9	1175	N/A	8.22
4											




After shearing (Spec. 1)


After shearing (Spec. 2)

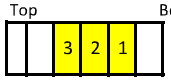



After shearing (Spec. 3)

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



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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 : 20.11.14

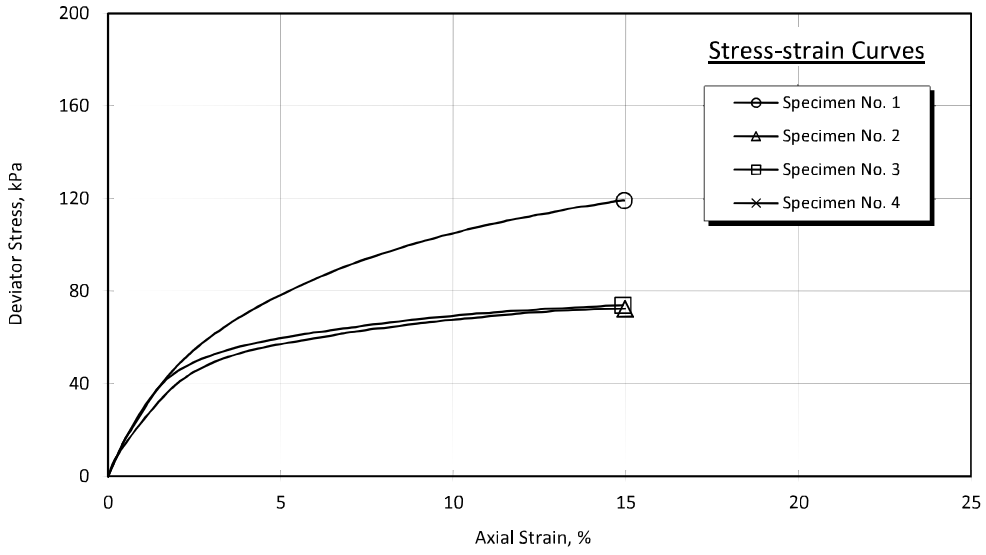
Borehole No.: PP3-23-2 Depth 5.00-5.80m

Tested by : Perera

Sample No. : HP-2 Strain Rate 1.00 %/min

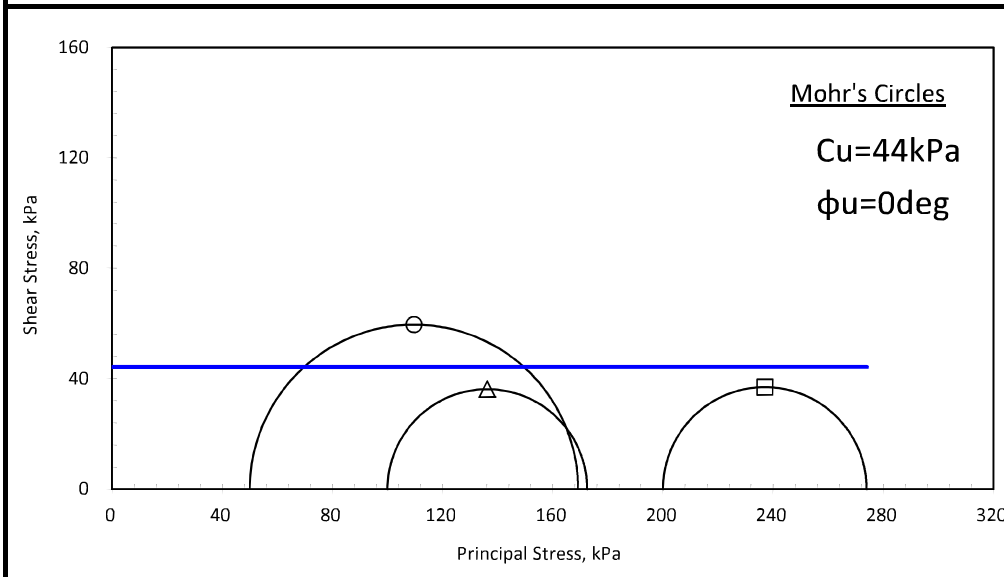
Checked by : A. B. Tan

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	29.3	1.93	1.50	50	119.1	2051	N/A	14.95
2	Undisturbed	99.80	50.10	32.0	1.87	1.42	100	72.4	2104	N/A	14.97
3	Undisturbed	99.80	50.00	30.7	1.91	1.46	200	73.9	2668	N/A	14.91
4											




After shearing (Spec. 1)


After shearing (Spec. 2)

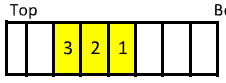



After shearing (Spec. 3)

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



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CONSOLIDATION TEST (e-log p curves)

Preparatory Survey on Matarbari USC Coal-fired Power

Project : Project

Project No.: S27-14 Tested by : Lim

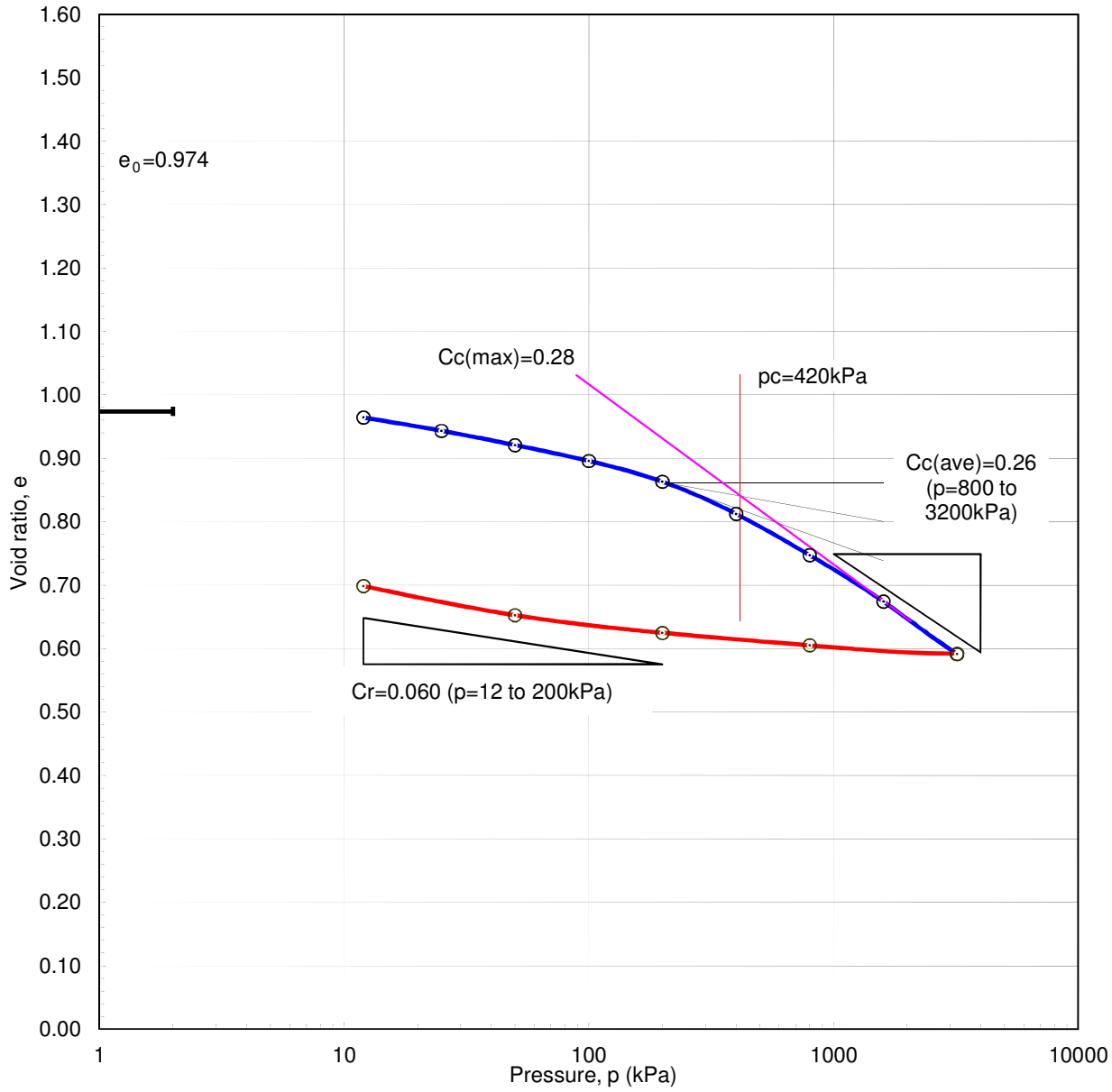
Soil Type : Clay with Sand Checked by : A. B. Tan

Borehole No. : PP3-23-2

Sample No. : HP-1

Depth of Sample : 2.00-2.55 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	2.00-2.55	0.974	420	0.28 (max)	0.26(average)	0.060 (average)	N/A



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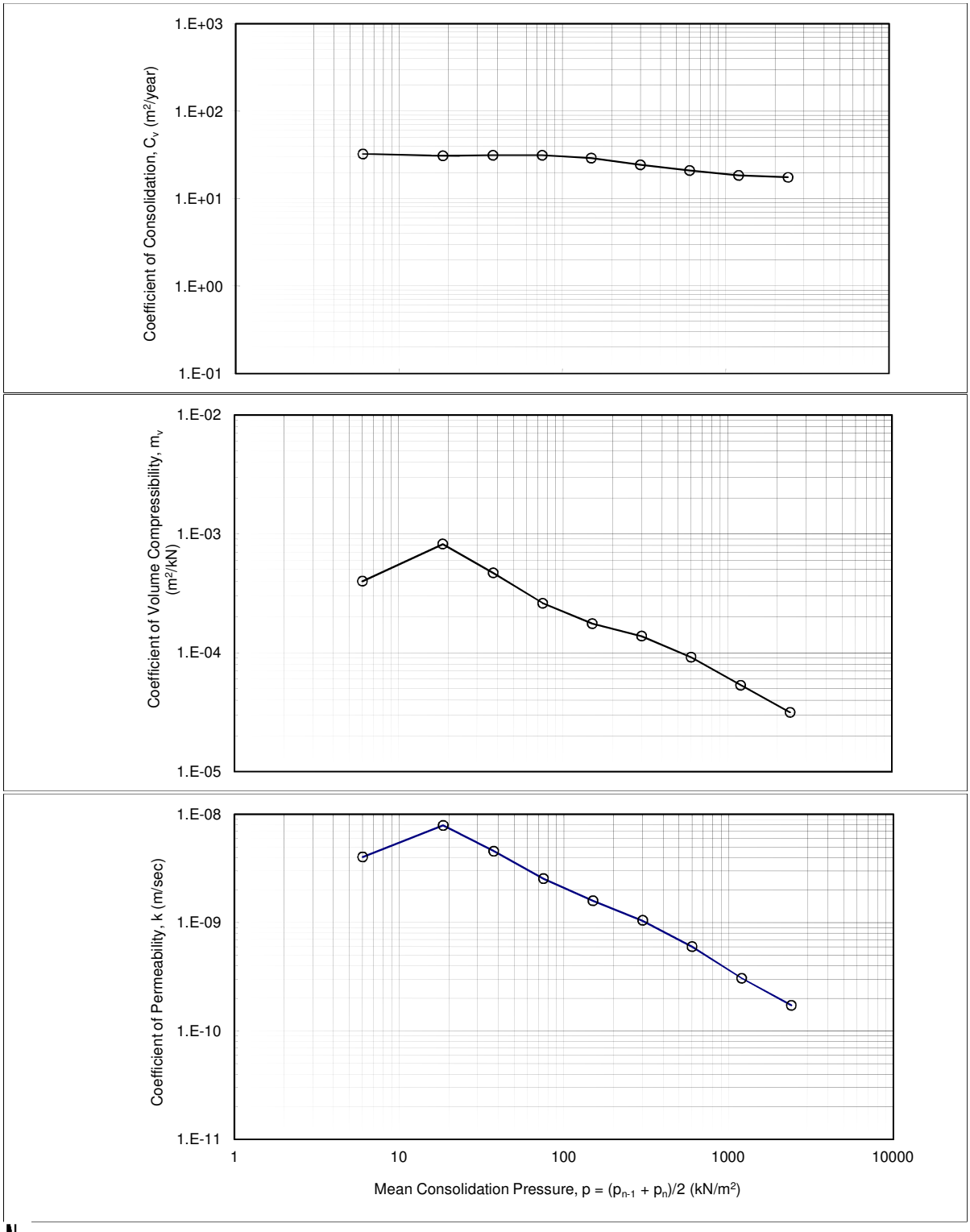
Consolidation Test (p - $\overline{cv}$, mv , k curves)

Project	:	Preparatory Survey on Matarbari USC Coal-fired Power Project		Borehole No. :	PP3-23-2
Project No.	:	S27-14		Sample No. :	HP-1
Date of testing	:	20-Nov-14	Tested by : Lim	Depth of Sample :	2.00-2.55 m



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PROJECT NAME : Preparatory Survey on Matarbari USC Coal-fired Power Project
PROJECT NO. : S27-14
BOREHOLE NO. : PP3-23-2
TESTING STANDARD : ASTM D2435-11
DATE : 20-Nov-14
SAMPLE NO. : HP-1
INITIAL HEIGHT OF SPECIMEN : 18.000 mm
NO. OF LOADING STEP : 9
DEPTH : 2.00-2.55 m
DIAMETER OF SPECIMEN : 53.900 mm
SPECIFIC GRAVITY : 2.73
TESTER NO. : 23
DRY WEIGHT OF SPECIMEN : 56.840 grams
SOLID HEIGHT OF SPECIMEN : 9.120 mm
INITIAL MOISTURE CONTENT : 31.7 %
BULK DENSITY : 1.85 Mg/m^3
METHOD OF TIME FITTING USED : SQUARE ROOT TIME CURVE - FITTING METHOD
LABORATORY TEMPERATURE : 23.0 ^{o}C

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				1.974	0.974
	12.000	8.6		17.957	0.48	3.99E-04		
12.000			17.914				1.964	0.964
	13.000	19.0		17.819	1.07	8.20E-04		
25.000			17.724				1.943	0.943
	25.000	20.6		17.621	1.17	4.68E-04		
50.000			17.518				1.921	0.921
	50.000	22.7		17.405	1.30	2.61E-04		
100.000			17.291				1.896	0.896
	100.000	30.1		17.141	1.76	1.76E-04		
200.000			16.990				1.863	0.863
	200.000	46.2		16.759	2.76	1.38E-04		
400.000			16.528				1.812	0.812
	400.000	59.5		16.231	3.67	9.16E-05		
800.000			15.933				1.747	0.747
	800.000	66.6		15.600	4.27	5.34E-05		
1600.000			15.267				1.674	0.674
	1600.000	75.1		14.892	5.04	3.15E-05		
3200.000			14.516				1.592	0.592

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	1.03	1.03E-06	8.90E-02	3.25E+01	1.8	0.204	4.03E-09
12.000								
	18.500	1.06	9.80E-07	8.47E-02	3.09E+01	3.6	0.188	7.89E-09
25.000								
	37.500	1.03	9.94E-07	8.59E-02	3.14E+01	3.5	0.170	4.56E-09
50.000								
	75.000	1.00	9.95E-07	8.59E-02	3.14E+01	3.0	0.232	2.55E-09
100.000								
	150.000	1.05	9.23E-07	7.98E-02	2.91E+01	5.8	0.157	1.59E-09
200.000								
	300.000	1.19	7.73E-07	6.68E-02	2.44E+01	7.5	0.152	1.05E-09
400.000								
	600.000	1.30	6.67E-07	5.76E-02	2.10E+01	9.3	0.156	5.99E-10
800.000								
	1200.000	1.37	5.85E-07	5.06E-02	1.85E+01	9.5	0.143	3.06E-10
1600.000								
	2400.000	1.31	5.56E-07	4.80E-02	1.75E+01	11.3	0.151	1.72E-10
3200.000								

REBOUND

P	800.000	200.000	50.000	12.000
H	14.638	14.819	15.072	15.491
E	0.605	0.625	0.653	0.699

CONSOLIDATION TEST (e-log p curves)

Preparatory Survey on Matarbari USC Coal-fired Power

Project : Project

Project No.: S27-14 Tested by : Lim

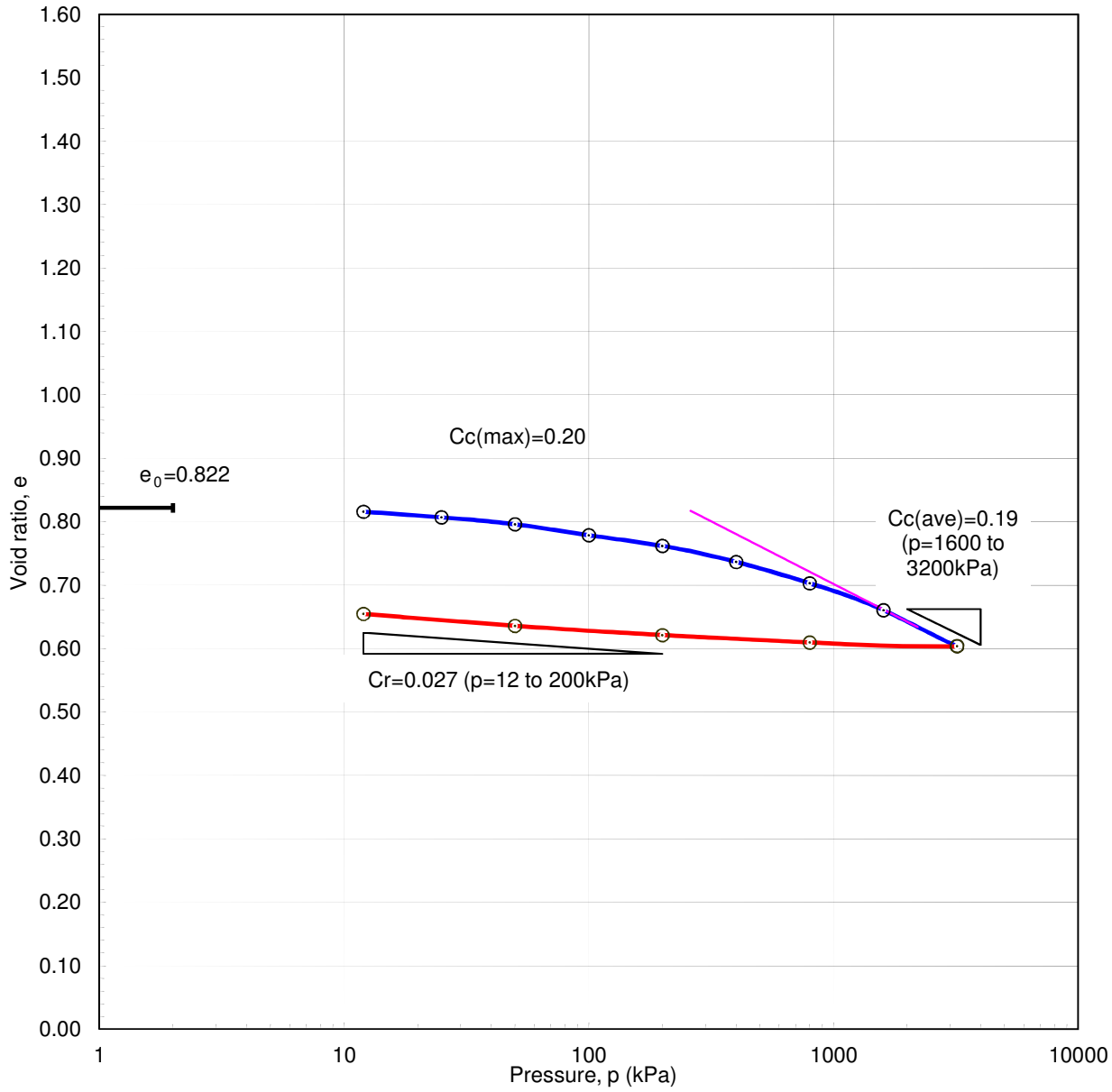
Soil Type : Sandy Clay Checked by : A. B. Tan

Borehole No. : PP3-23-2

Sample No. : HP-2

Depth of Sample : 5.00-5.80 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-2	5.00-5.80	0.822	-	0.20 (max)	0.19(average)	0.027 (average)	N/A



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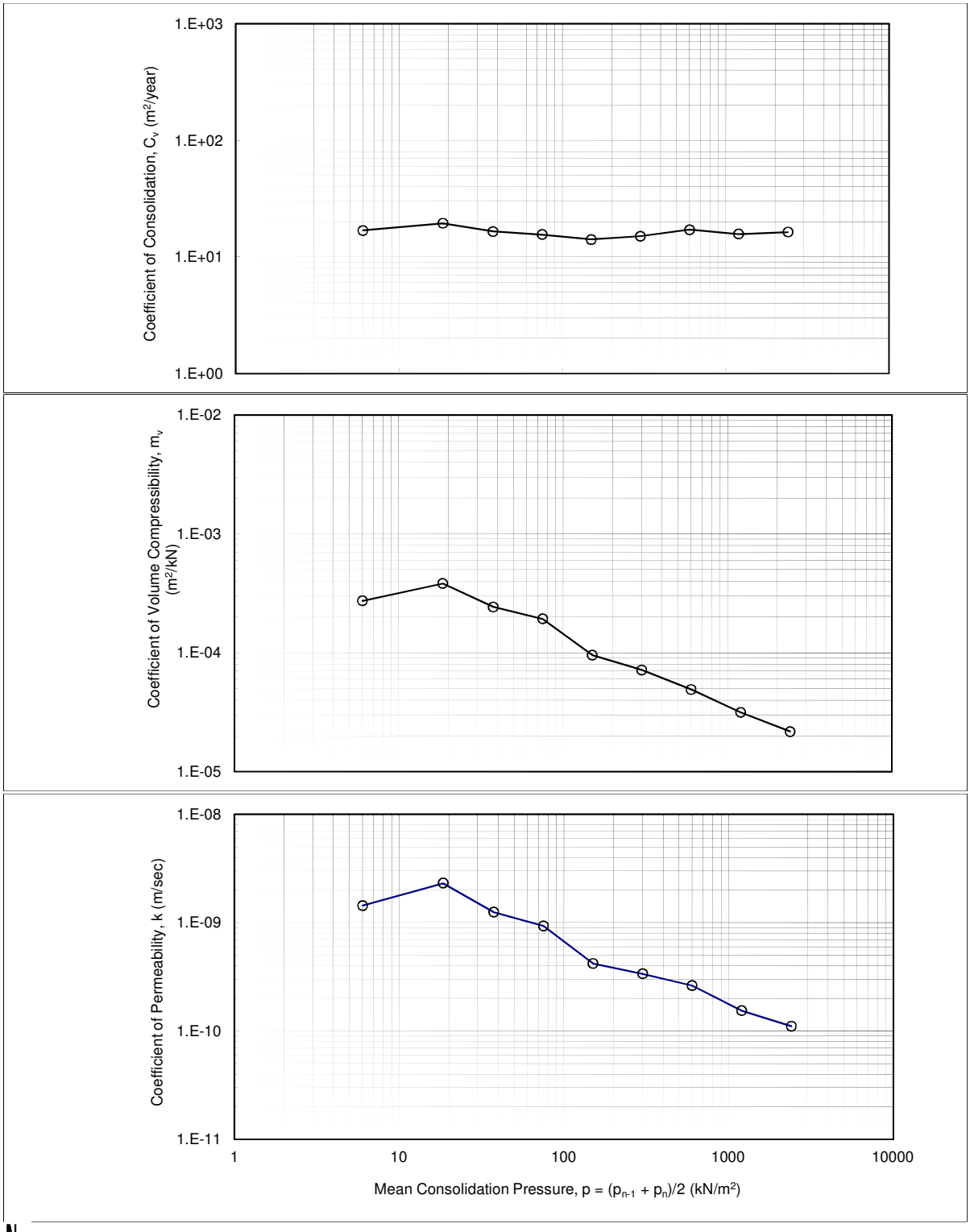
Consolidation Test (p - $\overline{cv}$, mv , k curves)

Project	:	Preparatory Survey on Matarbari USC Coal-fired Power Project		Borehole No. :	PP3-23-2
Project No.	:	S27-14		Sample No. :	HP-2
Date of testing	:	20-Nov-14	Tested by : Lim	Depth of Sample :	5.00-5.80 m



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PROJECT NAME : Preparatory Survey on Matarbari USC Coal-fired Power Project
PROJECT NO. : S27-14
BOREHOLE NO. : PP3-23-2
TESTING STANDARD : ASTM D2435-11
DATE : 20-Nov-14
SAMPLE NO. : HP-2
INITIAL HEIGHT OF SPECIMEN : 18.000 mm
NO. OF LOADING STEP : 9
DEPTH : 5.00-5.80 m
DIAMETER OF SPECIMEN : 53.900 mm
SPECIFIC GRAVITY : 2.71
TESTER NO. : 27
DRY WEIGHT OF SPECIMEN : 61.090 grams
SOLID HEIGHT OF SPECIMEN : 9.880 mm
INITIAL MOISTURE CONTENT : 28.9 %
BULK DENSITY : 1.91 Mg/m^3
METHOD OF TIME FITTING USED : SQUARE ROOT TIME CURVE - FITTING METHOD
LABORATORY TEMPERATURE : 23.0 ^{o}C

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				1.822	0.822
	12.000	5.9		17.971	0.33	2.74E-04		
12.000			17.941				1.816	0.816
	13.000	8.9		17.897	0.50	3.83E-04		
25.000			17.852				1.807	0.807
	25.000	10.8		17.798	0.61	2.43E-04		
50.000			17.744				1.796	0.796
	50.000	17.0		17.659	0.96	1.93E-04		
100.000			17.574				1.779	0.779
	100.000	16.7		17.491	0.95	9.55E-05		
200.000			17.407				1.762	0.762
	200.000	24.8		17.283	1.43	7.17E-05		
400.000			17.159				1.737	0.737
	400.000	33.4		16.992	1.97	4.91E-05		
800.000			16.825				1.703	0.703
	800.000	41.9		16.616	2.52	3.15E-05		
1600.000			16.406				1.661	0.661
	1600.000	56.1		16.126	3.48	2.17E-05		
3200.000			15.845				1.604	0.604

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	1.98	5.35E-07	4.62E-02	1.69E+01	1.2	0.202	1.44E-09
12.000								
	18.500	1.71	6.16E-07	5.32E-02	1.94E+01	2.0	0.228	2.31E-09
25.000								
	37.500	1.99	5.24E-07	4.53E-02	1.65E+01	1.8	0.166	1.25E-09
50.000								
	75.000	2.08	4.93E-07	4.26E-02	1.56E+01	2.9	0.168	9.32E-10
100.000								
	150.000	2.24	4.48E-07	3.87E-02	1.41E+01	3.2	0.190	4.20E-10
200.000								
	300.000	2.05	4.78E-07	4.13E-02	1.51E+01	4.0	0.163	3.37E-10
400.000								
	600.000	1.75	5.43E-07	4.69E-02	1.71E+01	4.9	0.147	2.62E-10
800.000								
	1200.000	1.82	4.98E-07	4.31E-02	1.57E+01	7.3	0.175	1.54E-10
1600.000								
	2400.000	1.65	5.18E-07	4.48E-02	1.63E+01	8.0	0.142	1.11E-10
3200.000								

REBOUND

P	800.000	200.000	50.000	12.000
H	15.903	16.019	16.163	16.350
E	0.610	0.621	0.636	0.655

43) PP3-23-3

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TABLE SUMMARY OF SOIL TEST

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

Borehole No.		**PP3-23-3**									
Sample No.		HP-1	HP-2								
Sample Depth		2.00m ~2.75m	5.00m ~5.75m								
Condition of Sample		Undisturbed									
Natural Water Content	%	52.2	39.2								
Specific Gravity		2.78	2.75								
Wet Density	Mg/m^3	1.71	1.82								
Dry Density	Mg/m^3	1.12	1.31								
Natural Void Ratio		1.47	1.10								
Degree of Saturation	%	98	98								
Atterberg Limits	Liquid Limit, %	57	41								
	Plastic Limit, %	26	22								
	Plasticity Index, %	31	19								
Grain Size Analysis	Gravel, %	0	0								
	Sand, %	1	7								
	Silt, %	36	50								
	Clay & Colloid, %	63	43								
	Max. diameter, mm	0.106	0.850								
	Diam. at 60% mm	0.0040	0.013								
	Diam. at 10% mm	-	-								
Visual soil description		Clay	Clay								
Unified soil classification		CH	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

Checked by : A. B. Tan

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ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project Project No. : S27-14

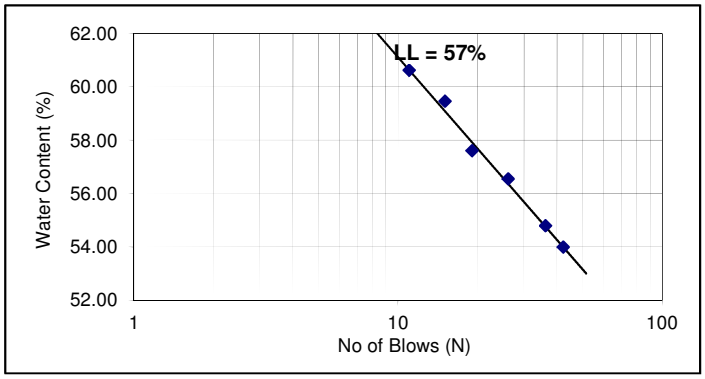
Standard : ASTM D4318-10 Date of Testing : 08.12.14

Tested By : Vasantha Checked By : A. B. Tan

Sample No. : PP3-23-3 HP-1 Depth : 2.00-2.75m

Remarks : Tested on material at natural state

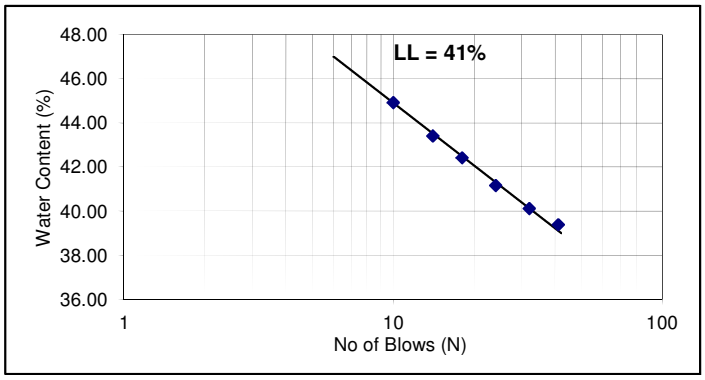
Liquid Limits Test		
Test No.	Blows	Wn
1	42	53.99
2	36	54.80
3	26	56.55
4	19	57.61
5	15	59.46
6	11	60.62
Liquid Limits %		**57**
Plastic Limits %		**26**
Plasticity Index		**31**



Sample No. : PP3-23-3 HP-2 Depth : 5.00-5.75m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	41	39.39
2	32	40.12
3	24	41.16
4	18	42.41
5	14	43.40
6	10	44.91
Liquid Limits %		**41**
Plastic Limits %		**22**
Plasticity Index		**19**



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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 : **06.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

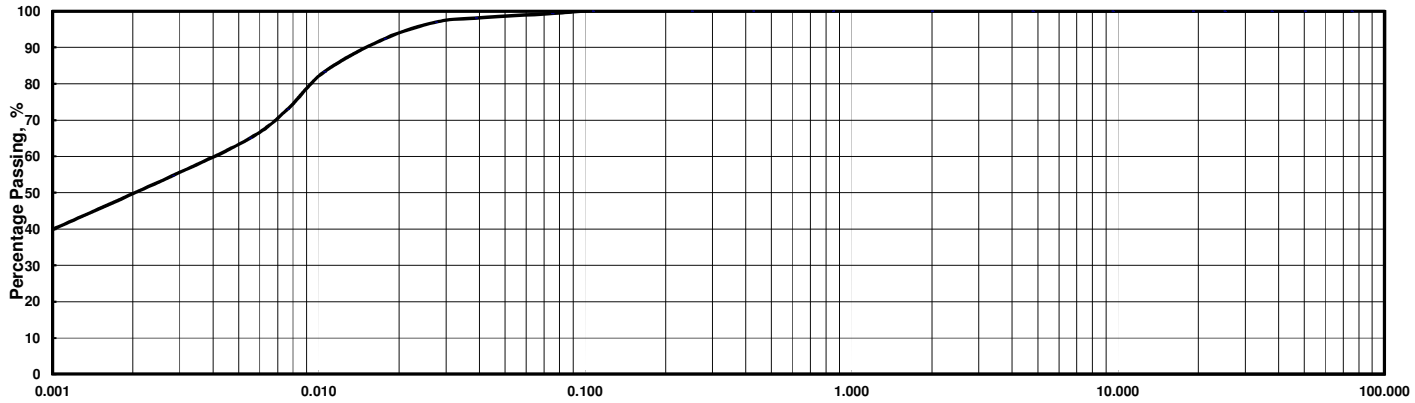
Sample No. : **PP3-23-3 HP-1** Depth : **2.00-2.75m** ( ) Specific Gravity : 2.78

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	99.3
Hydro.	Dia., mm	0.039	0.027	0.018	0.010	0.0076	0.0055	0.0028	0.0009							
	% Passing	98.1	96.9	92.4	83.3	73.0	65.0	54.7	37.6							

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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. Depth	PP3-23-3 HP-1 2.00-2.75m		Sample No. Depth	PP3-23-3 HP-1 2.00-2.75m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.106 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.0040 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	0.7 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	36.3 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	63.1 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	99.3 %				

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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 : **08.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

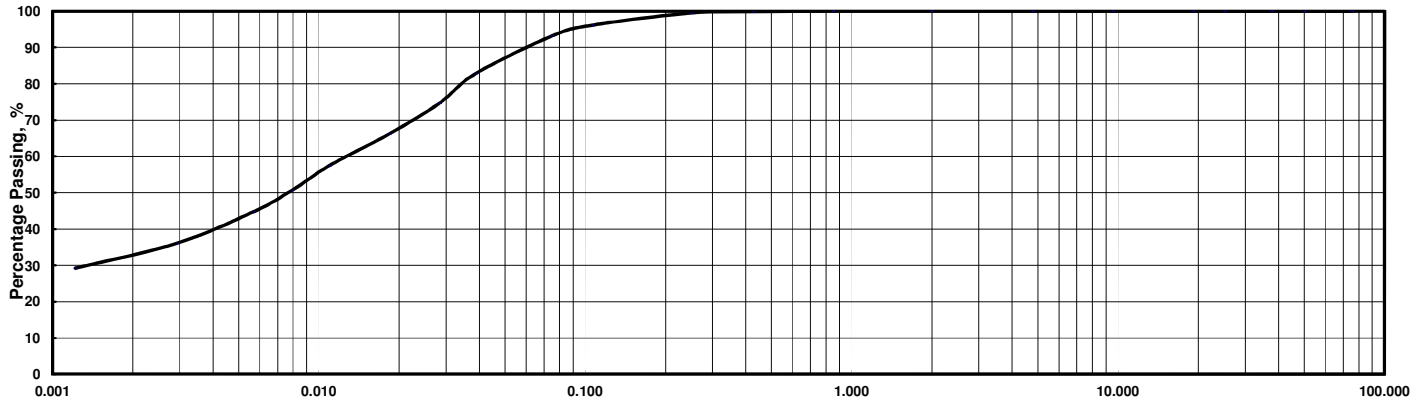
Sample No. : **PP3-23-3 HP-2** Depth : **5.00-5.75m** ( ) Specific Gravity : 2.75

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	99.8	99.5	96.1	93.2
Hydro.	Dia., mm	0.039	0.028	0.018	0.011	0.0079	0.0057	0.0029	0.0012							
	% Passing	82.8	74.6	66.3	57.5	50.7	44.8	36.1	29.2							

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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. Depth	PP3-23-3 HP-2 5.00-5.75m		Sample No. Depth	PP3-23-3 HP-2 5.00-5.75m	
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	0.2 %		Dia. at 30%	0.0013 mm	
0.425 - 0.075 mm	6.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	50.6 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	42.6 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	93.2 %				

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44) PP3-24-1

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TABLE SUMMARY OF SOIL TEST

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

Borehole No.		PP3-24-1									
Sample No.		HP-1	HP-2	D-1							
Sample Depth		2.00m ~2.80m	5.00m ~5.85m	8.00m ~8.85m							
Condition of Sample		Undisturbed		Disturbed							
Natural Water Content	%	35.6	28.0	23.6							
Specific Gravity		2.74	2.71	2.71							
Wet Density	Mg/m^3	1.92	1.91	1.92							
Dry Density	Mg/m^3	1.41	1.49	1.55							
Natural Void Ratio		0.94	0.82	0.75							
Degree of Saturation	%	100	93	86							
Atterberg Limits	Liquid Limit, %	31	- *3	- *3							
	Plastic Limit, %	19	- *3	- *3							
	Plasticity Index, %	12	- *3	- *3							
Grain Size Analysis	Gravel, %	0	0	0							
	Sand, %	18	64	70							
	Silt, %	48	22	15							
	Clay & Colloid, %	34	14	15							
	Max. diameter, mm	0.850	0.850	2.00							
	Diam. at 60% mm	0.033	0.12	0.16							
	Diam. at 10% mm	-	-	-							
Visual soil description		Clay with Sand	Silty Sand	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

Checked by : A. B. Tan

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ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project Project No. : S27-14

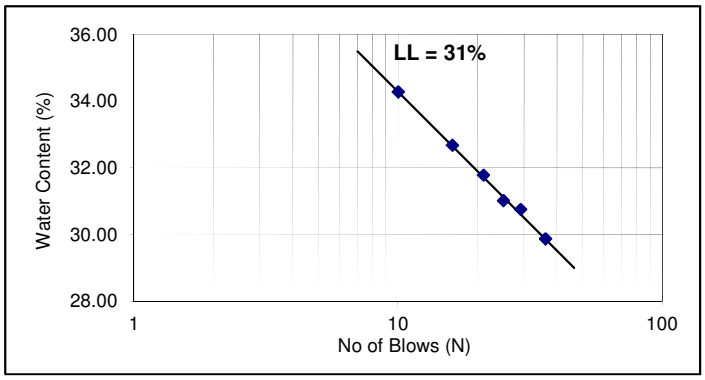
Standard : ASTM D4318-10 Date of Testing : 09.12.14

Tested By : Vasantha Checked By : A. B. Tan

Sample No. : PP3-24-1 HP-1 Depth : 2.00-2.80m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	36	29.87
2	29	30.75
3	25	31.01
4	21	31.77
5	16	32.67
6	10	34.27
Liquid Limits %		**31**
Plastic Limits %		**19**
Plasticity Index		**12**



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Singapore Branch

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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**

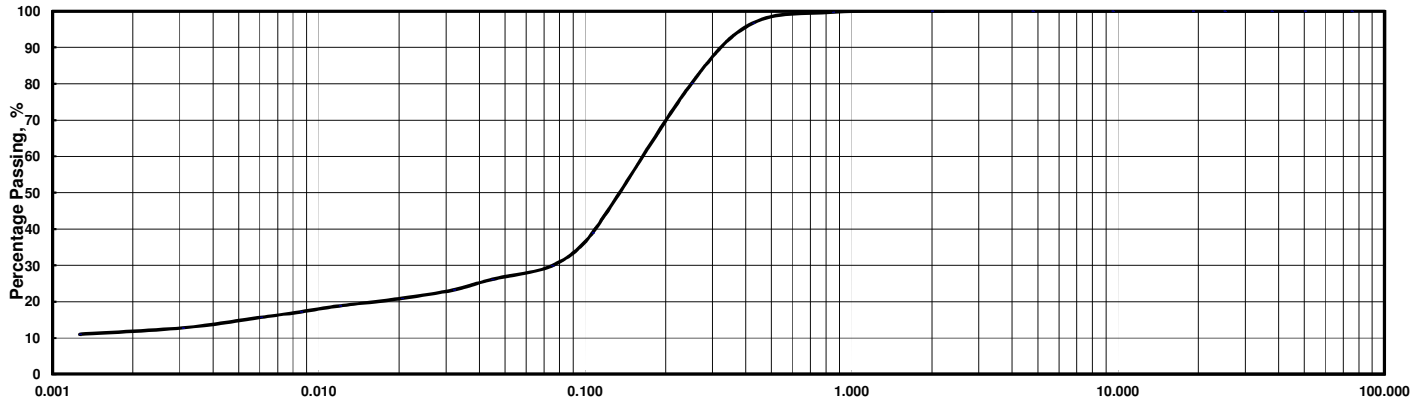
Sample No. : **PP3-24-1 D-1** Depth : **8.00-8.85m** ( ) Specific Gravity : 2.71

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	99.7	96.7	80.1	38.9	29.9
Hydro.	Dia., mm	0.045	0.032	0.021	0.012	0.0085	0.0061	0.0031	0.0013							
	% Passing	26.2	23.3	20.9	18.8	17.2	15.7	12.8	11.0							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-24-1 D-1 8.00-8.85m		Sample No. Depth	PP3-24-1 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%	0.16 mm	
2.00 - 0.425 mm	3.3 %		Dia. at 30%	0.075 mm	
0.425 - 0.075 mm	66.8 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	15.3 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	14.7 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	99.7 %				
75um Sieve Passing	29.9 %				

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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 : **08.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

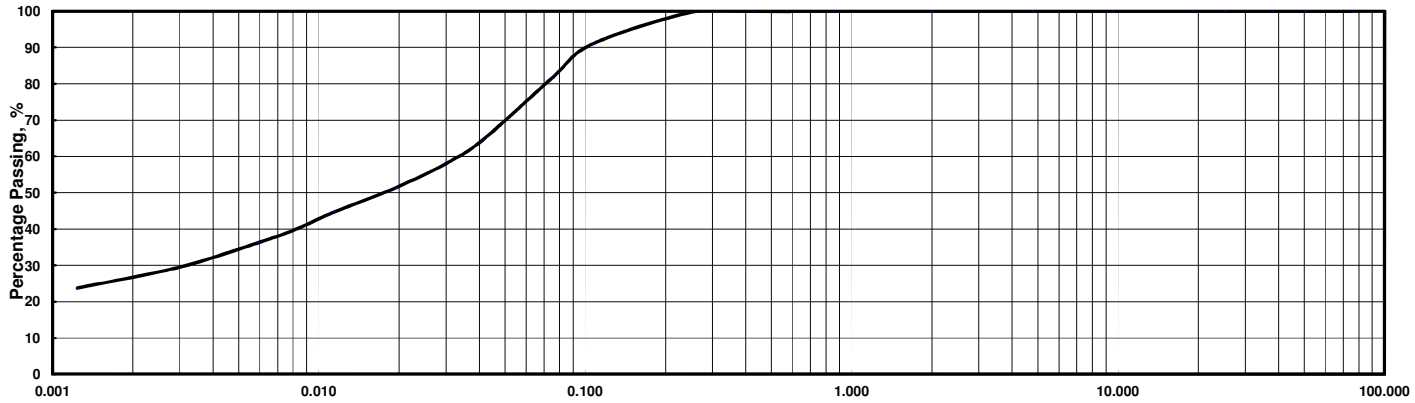
Sample No. : **PP3-24-1 HP-1** Depth : **2.00-2.80m** ( ) Specific Gravity : 2.74

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	99.8	99.7	90.9	81.6
Hydro.	Dia., mm	0.041	0.030	0.019	0.011	0.0082	0.0059	0.0030	0.0012							
	% Passing	64.7	58.0	51.3	44.7	39.9	36.1	29.5	23.8							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-24-1 HP-1 2.00-2.80m		Sample No. Depth	PP3-24-1 HP-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%	0.033 mm	
2.00 - 0.425 mm	0.2 %		Dia. at 30%	0.0031 mm	
0.425 - 0.075 mm	18.2 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	47.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	34.2 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	81.6 %				

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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**

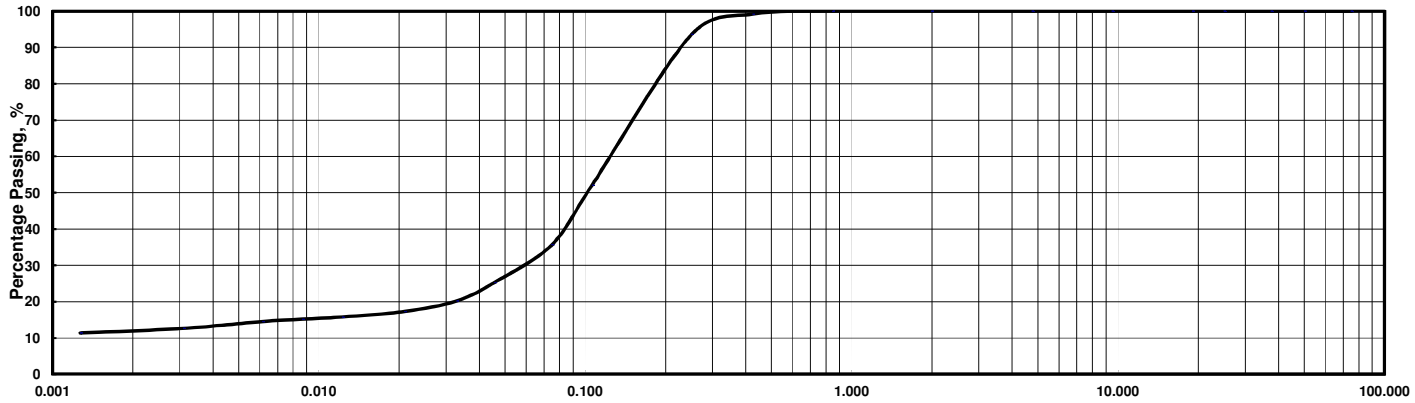
Sample No. : **PP3-24-1 HP-2** Depth : **5.00-5.85m** ( ) Specific Gravity : 2.71

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	99.2	93.5	52.1	35.7
Hydro.	Dia., mm	0.045	0.033	0.021	0.012	0.0087	0.0061	0.0031	0.0013							
	% Passing	25.3	20.2	17.3	15.8	15.2	14.5	12.6	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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-24-1 HP-2 5.00-5.85m		Sample No. Depth	PP3-24-1 HP-2 5.00-5.85m	
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	0.8 %		Dia. at 30%	0.057 mm	
0.425 - 0.075 mm	63.4 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	21.9 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	13.8 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	35.7 %				

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45) PP3-24-2

TABLE SUMMARY OF SOIL TEST

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

Borehole No.		PP3-24-2									
Sample No.		HP-1	HP-2	D-1							
Sample Depth		2.00m ~2.70m	5.00m ~5.85m	9.00m ~9.85m							
Condition of Sample		Undisturbed		Disturbed							
Natural Water Content	%	46.1	39.8	27.6							
Specific Gravity		2.77	2.75	2.72							
Wet Density	Mg/m^3	1.78	1.82	-							
Dry Density	Mg/m^3	1.22	1.30	-							
Natural Void Ratio		1.27	1.11	-							
Degree of Saturation	%	100	99	-							
Atterberg Limits	Liquid Limit, %	50	45	- *3							
	Plastic Limit, %	23	23	- *3							
	Plasticity Index, %	27	22	- *3							
Grain Size Analysis	Gravel, %	0	0	0							
	Sand, %	2	2	47							
	Silt, %	45	47	24							
	Clay & Colloid, %	53	51	29							
	Max. diameter, mm	0.106	0.106	0.850							
	Diam. at 60% mm	0.0066	0.0078	0.10							
	Diam. at 10% mm	-	-	-							
Visual soil description		Clay	Clay	Sandy Clay							
Unified soil classification		CH	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

Checked by : A. B. Tan

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ATTERBERG LIMITS DETERMINATION

Project Name : Preparatory Survey on Matarbari USC Coral-fired Power Project Project No. : S27-14

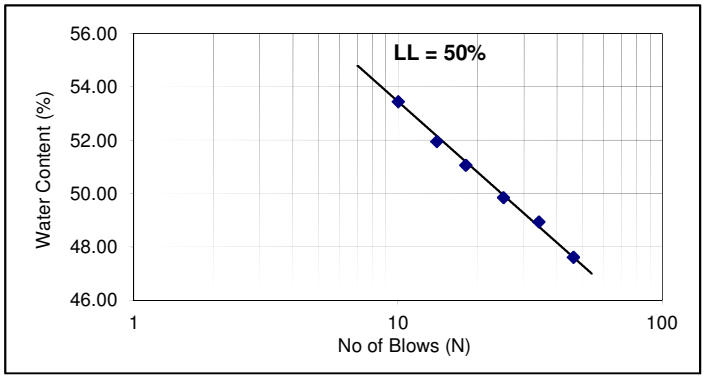
Standard : ASTM D4318-10 Date of Testing : 10.12.14

Tested By : Vasantha Checked By : A. B. Tan

Sample No. : PP3-24-2 HP-1 Depth : 2.00-2.70m

Remarks : Tested on material at natural state

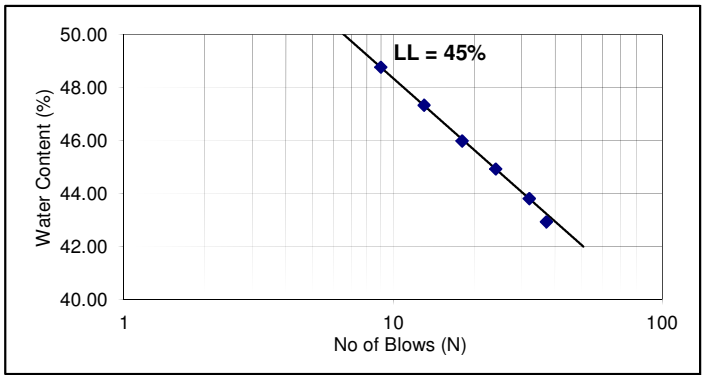
Liquid Limits Test		
Test No.	Blows	Wn
1	46	47.61
2	34	48.94
3	25	49.85
4	18	51.06
5	14	51.94
6	10	53.44
Liquid Limits %		**50**
Plastic Limits %		**23**
Plasticity Index		**27**



Sample No. : PP3-24-2 HP-2 Depth : 5.00-5.85m

Remarks : Tested on material at natural state

Liquid Limits Test		
Test No.	Blows	Wn
1	37	42.93
2	32	43.81
3	24	44.93
4	18	45.98
5	13	47.33
6	9	48.77
Liquid Limits %		**45**
Plastic Limits %		**23**
Plasticity Index		**22**



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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 : **08.12.14** Tested By : **Htin/Motiur** Checked by : **A. B. Tan**

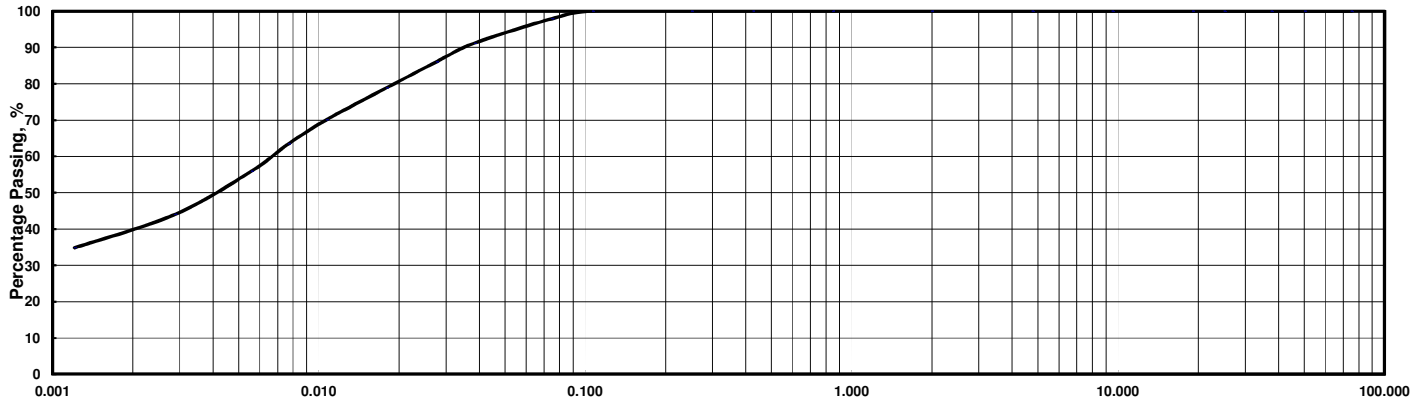
Sample No. : **PP3-24-2 HP-1** Depth : **2.00-2.70m** ( ) Specific Gravity : 2.74

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	100.0	100.0	100.0	97.9
Hydro.	Dia., mm	0.038	0.028	0.018	0.011	0.0077	0.0056	0.0029	0.0012							
	% Passing	91.2	86.1	78.9	70.1	63.5	55.9	44.1	34.8							

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		FINE	MEDIUM	COARSE	FINE	COARSE
	SILT	SAND			GRAVEL	

Sample No. / Depth	PP3-24-2 HP-1 2.00-2.70m		Sample No. / Depth	PP3-24-2 HP-1 2.00-2.70m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.106 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.0066 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	2.1 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	44.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	53.4 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	97.9 %				

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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**

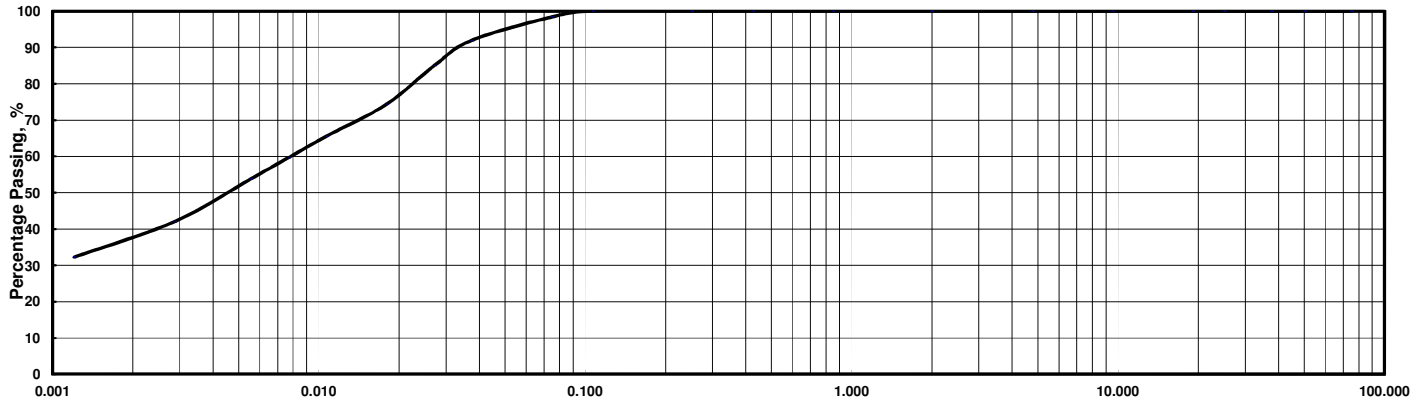
Sample No. : **PP3-24-2 HP-2** Depth : **5.00-5.85m** ( ) Specific Gravity : 2.75

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	98.4
Hydro.	Dia., mm	0.037	0.027	0.018	0.011	0.0077	0.0055	0.0029	0.0012							
	% Passing	92.0	85.1	74.4	65.5	59.7	53.8	42.1	32.3							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-24-2 HP-2 5.00-5.85m		Sample No. Depth	PP3-24-2 HP-2 5.00-5.85m	
Larger than 4.75 mm	0.0 %		Max. Diameter	0.106 mm	
4.75 - 2.00 mm	0.0 %		Dia. at 60%	0.0078 mm	
2.00 - 0.425 mm	0.0 %		Dia. at 30%	- mm	
0.425 - 0.075 mm	1.6 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	47.0 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	51.4 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	98.4 %				

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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**

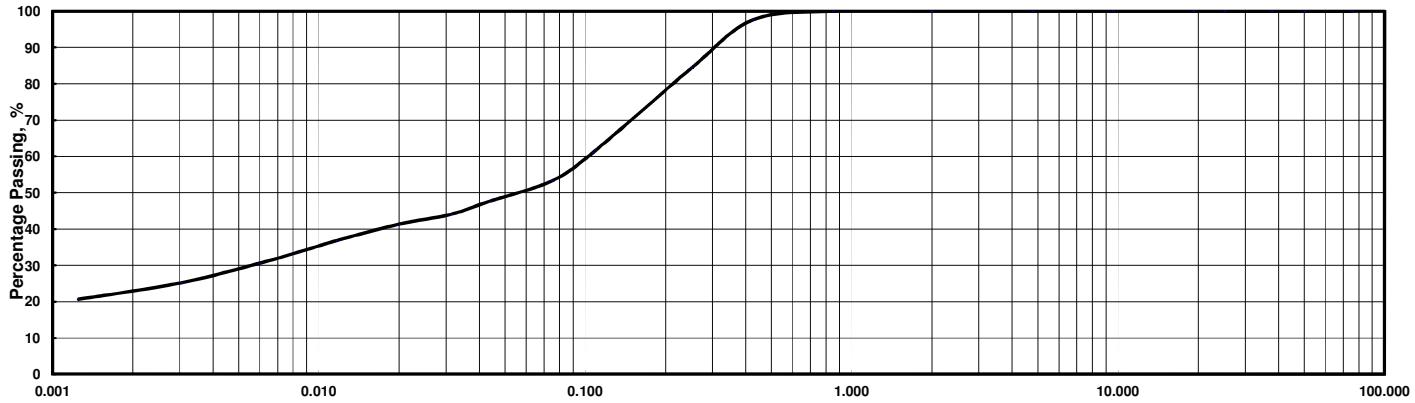
Sample No. : **PP3-24-2 D-1** Depth : **9.00-9.85m** ( ) Specific Gravity : 2.72

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	97.6	84.3	60.9	53.3
Hydro.	Dia., mm	0.044	0.031	0.020	0.012	0.0083	0.0060	0.0030	0.0013							
	% Passing	47.6	44.0	41.3	36.8	33.6	30.6	25.2	20.7							

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		FINE	MEDIUM	COARSE		FINE	COARSE		
	SILT	SAND				GRAVEL			

Sample No. Depth	PP3-24-2 D-1 9.00-9.85m		Sample No. Depth	PP3-24-2 D-1 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%	0.10 mm	
2.00 - 0.425 mm	2.4 %		Dia. at 30%	0.0056 mm	
0.425 - 0.075 mm	44.3 %		Dia. at 10%	- mm	
0.075 - 0.005 mm	24.5 %		Coeff. of Uniformity	-	
Smaller than 0.005 mm	28.8 %		Coeff. of Curvature	-	
2000um Sieve Passing	100.0 %				
425um Sieve Passing	100.0 %				
75um Sieve Passing	53.3 %				

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46) Others

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TABLE SUMMARY OF SOIL TEST (Site Laboratory)

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

Borehole No.			**Others**							
Sample No.			Cx-1	Cx-2	Sh-1	CR-1	MA-1			
Sample Depth			- -	- -	- -	- -	- -			
Condition of Sample			Disturbed							
Atterberg Limits	Liquid Limit,	%	-	-	-	-	-			
	Plastic Limit,	%	-	-	-	-	-			
	Plasticity Index,	%	-	-	-	-	-			
Grain Size Analysis	Gravel,	%	0	1	0	0	0			
	Sand,	%	99	97	99	99	99			
	Silt,	%	1	2	1	1	1			
	Clay & Colloid,	%								
	Max. diameter,	mm	2.00	9.50	4.75	4.75	2.0			
	Diam. at 60%	mm	0.32	0.94	0.23	0.35	0.28			
	Diam. at 10%	mm	0.13	0.26	0.10	0.14	0.12			
Visual soil description			Sand	Sand	Sand	Sand	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 :

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GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

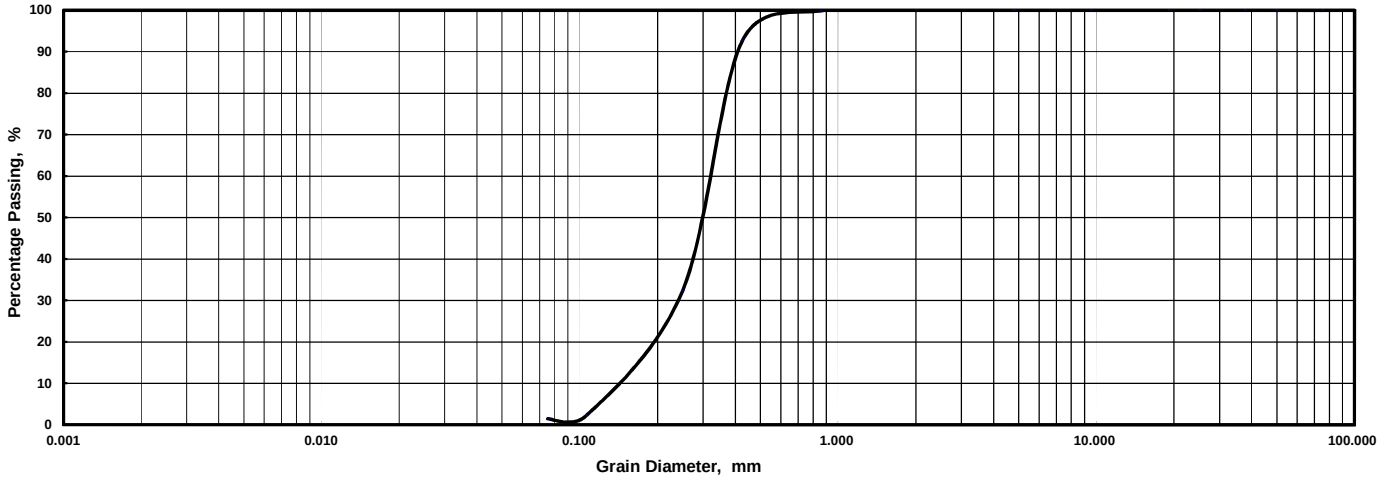
Location : **Cox's Bazar** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/11/21** Tested By : **Sadamoto** Checked by :

Sample No. : **Cx-1** Depth : - ( ) 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	92.5	32.3	2.2	1.5
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	5.9	53.7	77.5	78.2
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	7.5	67.7	97.8	98.5

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	Cx-1 -			Sample No. Depth	Cx-1 -		
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	7.5	%		Dia. at 50%	0.29	mm	
0.425 - 0.075 mm	91.1	%		Dia. at 30%	0.23	mm	
0.075 - 0.005 mm	1.5	%		Dia. at 10%	0.132	mm	
Smaller than 0.005 mm				Coeff. of Uniformity	2.41		
2000um Sieve Passing	100.0	%		Coeff. of Curvature	1.30		
425um Sieve Passing	92.5	%					
75um Sieve Passing	1.5	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

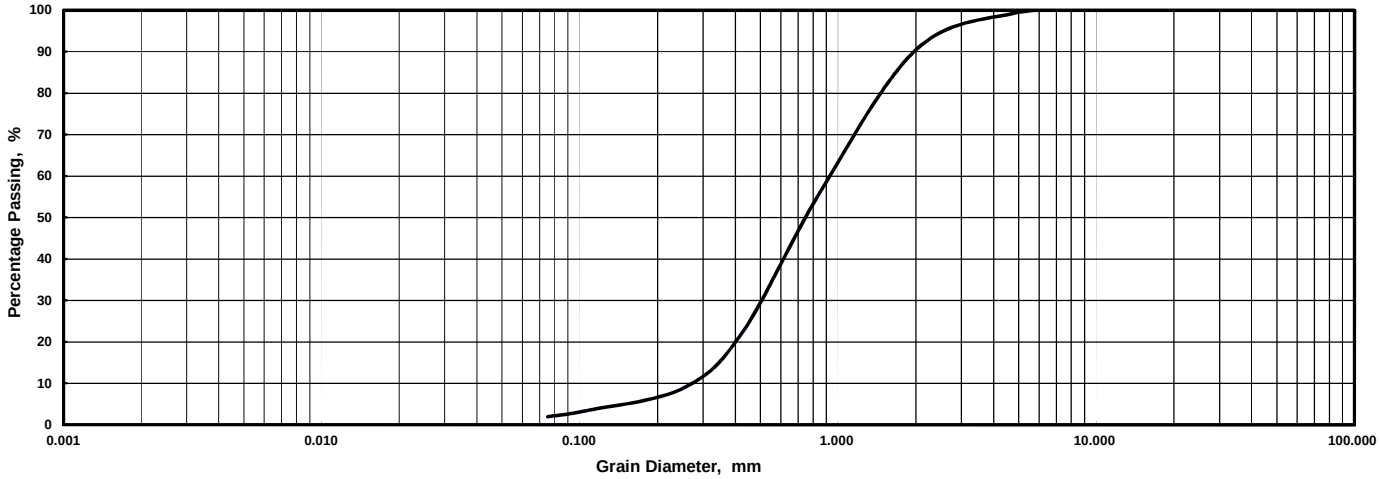
Location : **Cox's Bazar** Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/11/21** Tested By : **Sadamoto** Checked by :

Sample No. : **Cx-2** Depth : - ( ) 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	99.2	90.4	56.0	22.2	8.8	3.4	1.9
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.6	7.5	34.4	60.8	71.4	75.6	76.7
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.8	9.6	44.0	77.8	91.2	96.6	98.1

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	Cx-2 / -			Sample No. / Depth	Cx-2 / -		
Larger than 4.75 mm	0.8	%		Max. Diameter	9.50	mm	
4.75 - 2.00 mm	8.8	%		Dia. at 60%	0.94	mm	
2.00 - 0.425 mm	68.2	%		Dia. at 50%	0.75	mm	
0.425 - 0.075 mm	20.3	%		Dia. at 30%	0.50	mm	
0.075 - 0.005 mm	1.9	%		Dia. at 10%	0.262	mm	
Smaller than 0.005 mm				Coeff. of Uniformity	3.57		
2000um Sieve Passing	90.4	%		Coeff. of Curvature	1.01		
425um Sieve Passing	22.2	%					
75um Sieve Passing	1.9	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

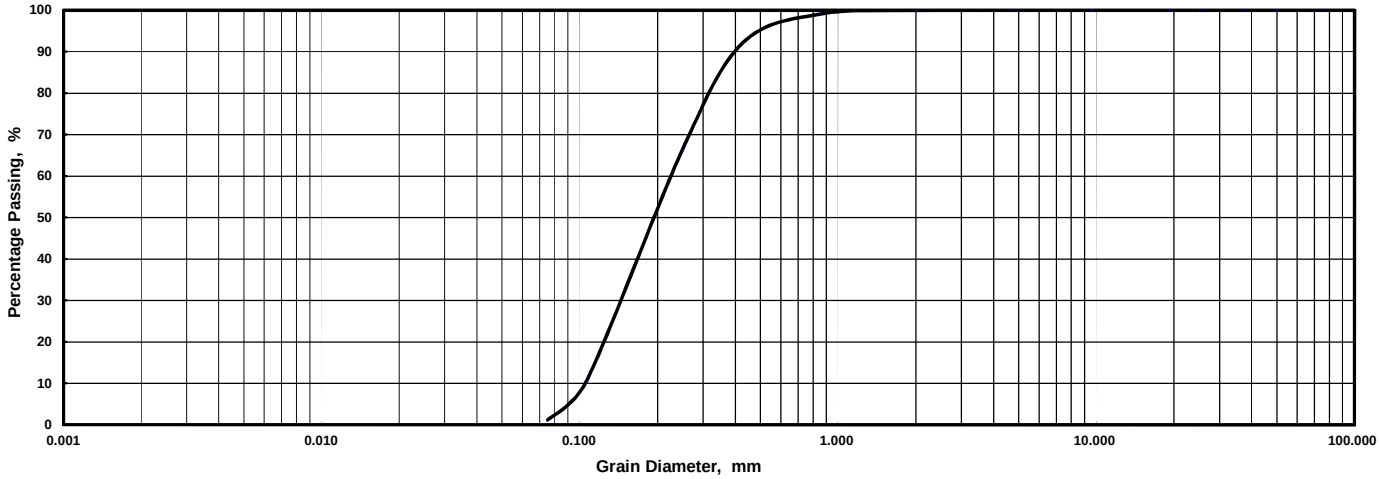
Location : Project No. : **S27-14**

Tested Method : **ASTM D422-63** Date of Testing : **2014/11/21** Tested By : **Sadamoto** Checked by :

Sample No. : **Sh-1** Depth : - ( ) 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	99.1	92.0	66.5	10.5	1.2
Retained Mass, g		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	6.1	25.4	67.9	74.9
Cumulative % Retained		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	8.0	33.5	89.5	98.8

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	Sh-1 -			Sample No. Depth	Sh-1 -		
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	7.9	%		Dia. at 50%	0.19	mm	
0.425 - 0.075 mm	90.8	%		Dia. at 30%	0.14	mm	
0.075 - 0.005 mm	1.2	%		Dia. at 10%	0.104	mm	
Smaller than 0.005 mm				Coeff. of Uniformity	2.18		
2000um Sieve Passing	99.9	%		Coeff. of Curvature	0.87		
425um Sieve Passing	92.0	%					
75um Sieve Passing	1.2	%					

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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 : **Motiur** Checked by : **A. B. Tan**

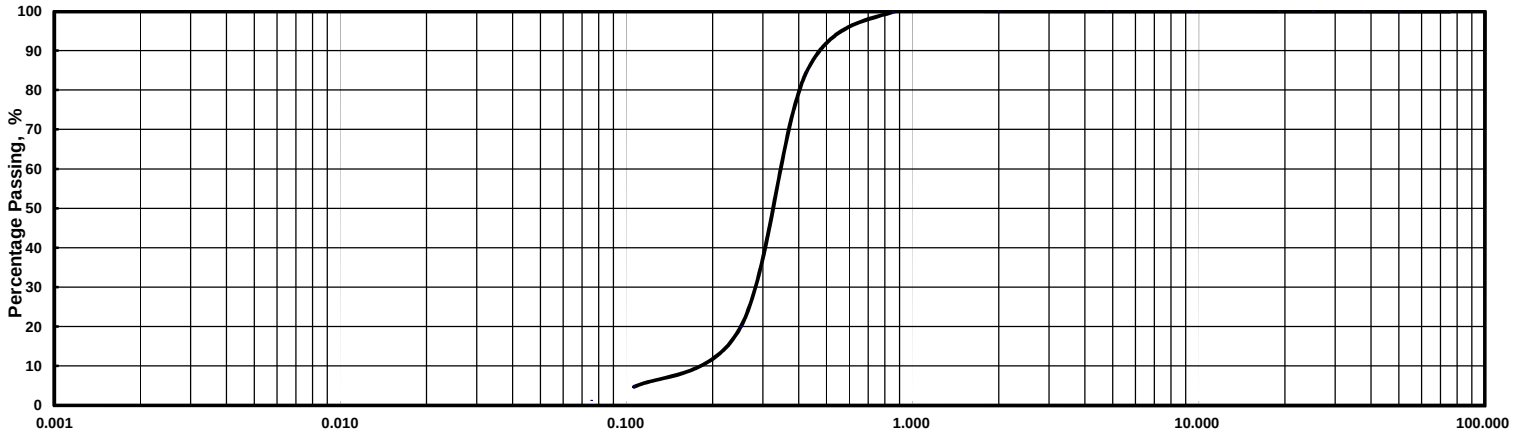
Sample No. : **CR-1** Depth : - ( ) Specific Gravity :

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	99.8	84.6	19.9	4.7	1.2
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			FINE		MEDIUM	COARSE		FINE		COARSE	
	SILT		SAND					GRAVEL			

Sample No. Depth	CR-1 -			Sample No. Depth	CR-1 -		
Larger than 4.75 mm	0.0	%		Max. Diameter	4.75	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.35	mm	
2.00 - 0.425 mm	15.3	%		Dia. at 30%	0.27	mm	
0.425 - 0.075 mm	83.4	%		Dia. at 10%	0.14	mm	
0.075 - 0.005 mm	1.2	%		Coeff. of Uniformity	2.43		
Smaller than 0.005 mm				Coeff. of Curvature	1.49		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.8	%					
75um Sieve Passing	1.2	%					

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 : **11.12.14** Tested By : **Motiur** Checked by : **A. B. Tan**

Sample No. : **MA-1** Depth : - ( ) 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	93.0	50.2	5.4	0.9
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			FINE		MEDIUM	COARSE		FINE		COARSE	
	SILT		SAND					GRAVEL			

Sample No. Depth	MA-1 -			Sample No. Depth	MA-1 -		
Larger than 4.75 mm	0.0	%		Max. Diameter	2.00	mm	
4.75 - 2.00 mm	0.0	%		Dia. at 60%	0.28	mm	
2.00 - 0.425 mm	7.0	%		Dia. at 30%	0.17	mm	
0.425 - 0.075 mm	92.1	%		Dia. at 10%	0.12	mm	
0.075 - 0.005 mm	0.9	%		Coeff. of Uniformity	2.44		
Smaller than 0.005 mm				Coeff. of Curvature	0.88		
2000um Sieve Passing	100.0	%					
425um Sieve Passing	99.9	%					
75um Sieve Passing	0.9	%					

7. Results of Laboratory Tests on Samples from Exploratory Drilling <Chemical Properties>

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No. 81500661 -1-1/2

4-December-2014

Test Report

Client

Kiso-jiban Consultants Co.,Ltd.

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Results of analysis are reported as follows:

Sampling date	26-October-2014
Sample received	6-November-2014
Sampling person	Client

Laboratory co-ordinater Masafumi Yoshikawa

Sample name	D-1
Sample category	Dredge soil
Special mention	Elution test ; Environment Agency Notification No.14,1973 Subject : Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh Sampling site : Matarbari,Maheshkhali Upazila, Cox's Bazar District, Dhaka Division, Bangladesh

Analysis	Results	Instrument	Determination limit
Alkyl mercury compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 2 GC(ECD)	0.0005 mg/L
Mercury and its compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 1 R-AAS	0.0005 mg/L
Cadmium and its compounds	N.D	JIS K0102(2008) 55.4 ICP/MS	0.001 mg/L
Lead and its compounds	N.D	JIS K0102(2008) 54.4 ICP/MS	0.01 mg/L
Organic phosphorous compounds	N.D	Environment Agency Notification No.64,1974 Appendix table 1 GC(FPD)	0.1 mg/L
Chromium(VI) compounds	N.D	JIS K0102(2008) 65.2.1 Absorption spectrophotometry	0.04 mg/L
Arsenic and its compounds	N.D	JIS K0102(2008) 61.2 HG-AAS	0.005 mg/L
Cyanides	N.D	JIS K0102(2008) 38.3 Absorption spectrophotometry	0.1 mg/L
Polychlorinated biphenyls(PCBs)	N.D	Environment Agency Notification No.59,1971 Appendix table 3 GC(ECD)	0.0005 mg/L
Organochlorine compounds	N.D	Environment Agency Notification No.14,1973 Appendix table 1 Absorption spectrophotometry	4 mg/kg-Wet
Copper and its compounds	N.D	JIS K0102(2008) 52.5 ICP/MS	0.02 mg/L
Zinc and its compounds	0.005 mg/L	JIS K0102(2008) 53.4 ICP/MS	0.005 mg/L

「N.D」indicates values below the determination limit

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Analysis	Results	Instrument	Determination limit
Fluorides	N.D	JIS K0102(2008) 34.1 Absorption spectrophotometry	0.1 mg/L
Trichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Tetrachloroethylene	N.D	JIS K0102 5.2 HS-GC/MS	0.0005 mg/L
Beryllium and its compounds	N.D	Environment Agency Notification No.13,1973 Appendix table 7-3 ICP/AES	0.05 mg/L
Chromium and its compounds	N.D	JIS K0102(2008) 65.1.5 ICP/MS	0.04 mg/L
Nickel and its compounds	N.D	JIS K0102(2008) 59.3 ICP/AES	0.01 mg/L
Vanadium and its compounds	N.D	JIS K0102(2008) 70.4 ICP/AES	0.01 mg/L
Dichloromethane	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Carbon tetrachloride	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
1,2-dichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0004 mg/L
1,1-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Cis-1,2-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.004 mg/L
1,1,1-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0005 mg/L
1,1,2-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0006 mg/L
1,3-dichloropropene	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
Thiuram	N.D	Environment Agency Notification No.59,1971 Appendix table 4 HPLC	0.0006 mg/L
Simazine	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.0003 mg/L
Thiobencarb	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.002 mg/L
Benzene	N.D	JIS K0125 5.2 HS-GC/MS	0.001 mg/L
Selenium and its compounds	N.D	JIS K0102(2008) 67.2 HG-AAS	0.002 mg/L
1,4-dioxane	N.D	Environment Agency Notification No.59,1971 Appendix table 7-3 HS-GC/MS	0.05 mg/L
Water content	16.5 %-Wet	Gravimetric analysis	0.1 %-Wet

「N.D」 indicates values below the determination limit

Test Report

№ 81500625
PAGE 1/2
ISSUE DATE 3-Dec-14

Client
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Laboratory Co-ordinater Katsuya Toda

Test name	Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh
Sample name	D-1
Sampling execution	Submitted by client
Sample No.	74330102-1
Date of analysis	25-Nov-14
Special mention	Sampling place:Matarbari,Maheshkhali Upazila,Cox's Bazar District,Dhaka Division,Bangladesh

Analysis item	Result	Unit	Method
POLYCHLORINATED DIBENZO-ρ-DIOXINS(PCDDs)	5.8	pg/L	Environment Agency Notification No.68,2003 (JIS K 0312:2008)
POLYCHLORINATED DIBENZOFURANS (PCDFs)	6.1	pg/L	
CO-PLANAR POLYCHLORINATED BIPHENYLS (Co-PCBs)	5.3	pg/L	
2,3,7,8-TCDD toxicity equivalents	0.00021	pg-TEQ/L	

[NOTE]
Used WHO-IPCS(2006) as TEF

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Table of dioxins concentration analysis results

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PAGE 2/2
ISSUE DATE 3-Dec-14

Sample name D-1

Components of quantitation target		Survey concentration (pg/L)	Detection limit (pg/L)	Detection limit (pg/L)	Toxicity Equivalency Factor	2,3,7,8-TCDD toxicity equivalent (pg-TEQ/L)
PCDDs	1,3,6,8-TeCDD	ND	0.10	0.03	0	0
	1,3,7,9-TeCDD	ND	0.4	0.1	0	0
	2,3,7,8-TeCDD	ND	0.14	0.04	1	0
	TeCDDs	5.0	-	-	-	-
	1,2,3,7,8-PeCDD	ND	0.12	0.04	1	0
	PeCDDs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDD	ND	0.5	0.2	0.1	0
	1,2,3,6,7,8-HxCDD	ND	0.5	0.1	0.1	0
	1,2,3,7,8,9-HxCDD	ND	0.28	0.08	0.1	0
	HxCDDs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDD	ND	0.6	0.2	0.01	0
	HpCDDs	ND	-	-	-	-
	OCDD	(0.8)	1.1	0.3	0.0003	0
	Total PCDDs	5.8	-	-	-	0
PCDFs	1,2,7,8-TeCDF	0.9	0.7	0.2	0	0
	2,3,7,8-TeCDF	(0.4)	0.5	0.1	0.1	0
	TeCDFs	6.1	-	-	-	-
	1,2,3,7,8-PeCDF	ND	0.26	0.08	0.03	0
	2,3,4,7,8-PeCDF	ND	0.21	0.06	0.3	0
	PeCDFs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDF	ND	0.3	0.1	0.1	0
	1,2,3,6,7,8-HxCDF	ND	0.4	0.1	0.1	0
	1,2,3,7,8,9-HxCDF	ND	0.4	0.1	0.1	0
	2,3,4,6,7,8-HxCDF	ND	0.27	0.08	0.1	0
	HxCDFs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDF	ND	0.7	0.2	0.01	0
	1,2,3,4,7,8,9-HpCDF	ND	0.9	0.3	0.01	0
	HpCDFs	ND	-	-	-	-
	OCDF	ND	1.9	0.6	0.0003	0
	Total PCDFs	6.1	-	-	-	0
Total PCDDs+PCDFs		12	-	-	-	0
Co-PCBs	3,3',4,4'-TeCB(#77)	0.8	0.6	0.2	0.0001	0.00008
	3,4,4',5-TeCB(#81)	ND	0.6	0.2	0.0003	0
	3,3',4,4',5-PeCB(#126)	ND	0.13	0.04	0.1	0
	3,3',4,4',5,5'-HxCB(#169)	ND	0.3	0.1	0.03	0
	Total non-orthoCBs	0.80	-	-	-	0.00008
	2,3,3',4,4'-PeCB(#105)	1.1	0.19	0.06	0.00003	0.000033
	2,3,4,4',5-PeCB(#114)	ND	0.6	0.2	0.00003	0
	2,3',4,4',5-PeCB(#118)	2.7	0.9	0.3	0.00003	0.000081
	2',3,4,4',5-PeCB(#123)	ND	0.6	0.2	0.00003	0
	2,3,3',4,4',5-HxCB(#156)	0.5	0.5	0.1	0.00003	0.000015
	2,3,3',4,4',5'-HxCB(#157)	ND	0.9	0.3	0.00003	0
	2,3',4,4',5,5'-HxCB(#167)	(0.2)	0.6	0.2	0.00003	0
	2,3,3',4,4',5,5'-HpCB(#189)	ND	0.6	0.2	0.00003	0
	Total mono-orthoCBs	4.5	-	-	-	0.000129
Total Co-PCBs		5.3	-	-	-	0.000209
Total PCDDs+PCDFs+Co-PCBs		17	-	-	-	0.00021

Note

① Used WHO-IPCS(2006) as TEF

② The numerical value with a parenthesis indicates the concentration of more than a minimum limit of detection and less than a determination limit.

③ "ND"in survey concentration describes under detection limit.

④ Values in parenthesis are below quantitation limit but greater or equal to detection limit.

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No. 81500662 -1-1/2

4-December-2014

Test Report

Client

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Results of analysis are reported as follows:

Sampling date	26-October-2014
Sample received	6-November-2014
Sampling person	Client

Laboratory co-ordinater Masafumi Yoshikawa

Sample name	D-2
Sample category	Dredge soil
Special mention	Elution test ; Environment Agency Notification No.14,1973 Subject : Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh Sampling site : Matarbari,Maheshkhali Upazila, Cox's Bazar District, Dhaka Division, Bangladesh

Analysis	Results	Instrument	Determination limit
Alkyl mercury compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 2 GC(ECD)	0.0005 mg/L
Mercury and its compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 1 R-AAS	0.0005 mg/L
Cadmium and its compounds	N.D	JIS K0102(2008) 55.4 ICP/MS	0.001 mg/L
Lead and its compounds	N.D	JIS K0102(2008) 54.4 ICP/MS	0.01 mg/L
Organic phosphorous compounds	N.D	Environment Agency Notification No.64,1974 Appendix table 1 GC(FPD)	0.1 mg/L
Chromium(VI) compounds	N.D	JIS K0102(2008) 65.2.1 Absorption spectrophotometry	0.04 mg/L
Arsenic and its compounds	0.008 mg/L	JIS K0102(2008) 61.2 HG-AAS	0.005 mg/L
Cyanides	N.D	JIS K0102(2008) 38.3 Absorption spectrophotometry	0.1 mg/L
Polychlorinated biphenyls(PCBs)	N.D	Environment Agency Notification No.59,1971 Appendix table 3 GC(ECD)	0.0005 mg/L
Organochlorine compounds	N.D	Environment Agency Notification No.14,1973 Appendix table 1 Absorption spectrophotometry	4 mg/kg-Wet
Copper and its compounds	N.D	JIS K0102(2008) 52.5 ICP/MS	0.02 mg/L
Zinc and its compounds	0.006 mg/L	JIS K0102(2008) 53.4 ICP/MS	0.005 mg/L

「N.D」indicates values below the determination limit

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Analysis	Results	Instrument	Determination limit
Fluorides	0.1 mg/L	JIS K0102(2008) 34.1 Absorption spectrophotometry	0.1 mg/L
Trichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Tetrachloroethylene	N.D	JIS K0102 5.2 HS-GC/MS	0.0005 mg/L
Beryllium and its compounds	N.D	Environment Agency Notification No.13,1973 Appendix table 7-3 ICP/AES	0.05 mg/L
Chromium and its compounds	N.D	JIS K0102(2008) 65.1.5 ICP/MS	0.04 mg/L
Nickel and its compounds	N.D	JIS K0102(2008) 59.3 ICP/AES	0.01 mg/L
Vanadium and its compounds	0.02 mg/L	JIS K0102(2008) 70.4 ICP/AES	0.01 mg/L
Dichloromethane	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Carbon tetrachloride	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
1,2-dichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0004 mg/L
1,1-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Cis-1,2-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.004 mg/L
1,1,1-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0005 mg/L
1,1,2-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0006 mg/L
1,3-dichloropropene	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
Thiuram	N.D	Environment Agency Notification No.59,1971 Appendix table 4 HPLC	0.0006 mg/L
Simazine	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.0003 mg/L
Thiobencarb	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.002 mg/L
Benzene	N.D	JIS K0125 5.2 HS-GC/MS	0.001 mg/L
Selenium and its compounds	N.D	JIS K0102(2008) 67.2 HG-AAS	0.002 mg/L
1,4-dioxane	N.D	Environment Agency Notification No.59,1971 Appendix table 7-3 HS-GC/MS	0.05 mg/L
Water content	24.0 %-Wet	Gravimetric analysis	0.1 %-Wet

「N.D」indicates values below the determination limit

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Test Report

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ISSUE DATE 3-Dec-14

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Laboratory Co-ordinater Katsuya Toda

Test name	Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh
Sample name	D-2
Sampling execution	Submitted by client
Sample No.	74330102-2
Date of analysis	25-Nov-14
Special mention	Sampling place:Matarbari,Maheshkhali Upazila,Cox's Bazar District,Dhaka Division,Bangladesh

Analysis item	Result	Unit	Method
POLYCHLORINATED DIBENZO-p-DIOXINS(PCDDs)	250	pg/L	Environment Agency Notification No.68,2003 (JIS K 0312:2008)
POLYCHLORINATED DIBENZOFURANS (PCDFs)	ND		
CO-PLANAR POLYCHLORINATED BIPHENYLS (Co-PCBs)	2.6	pg/L	
2,3,7,8-TCDD toxicity equivalents	0.086	pg-TEQ/L	

[NOTE]
Used WHO-IPCS(2006) as TEF

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Table of dioxins concentration analysis results

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ISSUE DATE 3-Dec-14

Sample name D-2

Components of quantitation target		Survey concentration (pg/L)	Detection limit (pg/L)	Detection limit (pg/L)	Toxicity Equivalency Factor	2,3,7,8-TCDD toxicity equivalent (pg-TEQ/L)
PCDDs	1,3,6,8-TeCDD	ND	0.11	0.03	0	0
	1,3,7,9-TeCDD	ND	0.4	0.1	0	0
	2,3,7,8-TeCDD	ND	0.15	0.05	1	0
	TeCDDs	ND	-	-	-	-
	1,2,3,7,8-PeCDD	ND	0.12	0.04	1	0
	PeCDDs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDD	ND	0.6	0.2	0.1	0
	1,2,3,6,7,8-HxCDD	ND	0.5	0.1	0.1	0
	1,2,3,7,8,9-HxCDD	ND	0.30	0.09	0.1	0
	HxCDDs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDD	1.1	0.7	0.2	0.01	0.011
	HpCDDs	2.4	-	-	-	-
	OCDD	250	1.1	0.3	0.0003	0.075
	Total PCDDs	250	-	-	-	0.086
PCDFs	1,2,7,8-TeCDF	ND	0.7	0.2	0	0
	2,3,7,8-TeCDF	ND	0.5	0.2	0.1	0
	TeCDFs	ND	-	-	-	-
	1,2,3,7,8-PeCDF	ND	0.27	0.08	0.03	0
	2,3,4,7,8-PeCDF	ND	0.22	0.07	0.3	0
	PeCDFs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDF	ND	0.3	0.1	0.1	0
	1,2,3,6,7,8-HxCDF	ND	0.4	0.1	0.1	0
	1,2,3,7,8,9-HxCDF	ND	0.4	0.1	0.1	0
	2,3,4,6,7,8-HxCDF	ND	0.28	0.08	0.1	0
	HxCDFs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDF	ND	0.7	0.2	0.01	0
	1,2,3,4,7,8,9-HpCDF	ND	1.0	0.3	0.01	0
	HpCDFs	ND	-	-	-	-
	OCDF	ND	2.0	0.6	0.0003	0
	Total PCDFs	ND	-	-	-	0
Total PCDDs+PCDFs		250	-	-	-	0.086
Co-PCBs	3,3',4,4'-TeCB(#77)	(0.2)	0.6	0.2	0.0001	0
	3,4,4',5-TeCB(#81)	ND	0.6	0.2	0.0003	0
	3,3',4,4',5-PeCB(#126)	ND	0.14	0.04	0.1	0
	3,3',4,4',5,5'-HxCB(#169)	ND	0.3	0.1	0.03	0
	Total non-orthoCBs	0.20	-	-	-	0
	2,3,3',4,4'-PeCB(#105)	0.40	0.20	0.06	0.00003	0.000012
	2,3,4,4',5-PeCB(#114)	ND	0.6	0.2	0.00003	0
	2,3',4,4',5-PeCB(#118)	1.5	0.9	0.3	0.00003	0.000045
	2',3,4,4',5-PeCB(#123)	ND	0.7	0.2	0.00003	0
	2,3,3',4,4',5-HxCB(#156)	(0.3)	0.5	0.1	0.00003	0
	2,3,3',4,4',5'-HxCB(#157)	ND	1.0	0.3	0.00003	0
	2,3',4,4',5,5'-HxCB(#167)	(0.2)	0.6	0.2	0.00003	0
	2,3,3',4,4',5,5'-HpCB(#189)	ND	0.6	0.2	0.00003	0
	Total mono-orthoCBs	2.4	-	-	-	0.000057
Total Co-PCBs		2.6	-	-	-	0.000057
Total PCDDs+PCDFs+Co-PCBs		260	-	-	-	0.086

Note

① Used WHO-IPCS(2006) as TEF

② The numerical value with a parenthesis indicates the concentration of more than a minimum limit of detection and less than a determination limit.

③ "ND"in survey concentration describes under detection limit.

④ Values in parenthesis are below quantitation limit but greater or equal to detection limit.

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No. 81500663 -1-1/2

4-December-2014

Test Report

Client

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Results of analysis are reported as follows:

Sampling date	26-October-2014
Sample received	6-November-2014
Sampling person	Client

Laboratory co-ordinater Masafumi Yoshikawa

Sample name	D-4
Sample category	Dredge soil
Special mention	Elution test ; Environment Agency Notification No.14,1973 Subject : Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh Sampling site : Matarbari,Maheshkhali Upazila, Cox's Bazar District, Dhaka Division, Bangladesh

Analysis	Results	Instrument	Determination limit
Alkyl mercury compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 2 GC(ECD)	0.0005 mg/L
Mercury and its compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 1 R-AAS	0.0005 mg/L
Cadmium and its compounds	N.D	JIS K0102(2008) 55.4 ICP/MS	0.001 mg/L
Lead and its compounds	N.D	JIS K0102(2008) 54.4 ICP/MS	0.01 mg/L
Organic phosphorous compounds	N.D	Environment Agency Notification No.64,1974 Appendix table 1 GC(FPD)	0.1 mg/L
Chromium(VI) compounds	N.D	JIS K0102(2008) 65.2.1 Absorption spectrophotometry	0.04 mg/L
Arsenic and its compounds	N.D	JIS K0102(2008) 61.2 HG-AAS	0.005 mg/L
Cyanides	N.D	JIS K0102(2008) 38.3 Absorption spectrophotometry	0.1 mg/L
Polychlorinated biphenyls(PCBs)	N.D	Environment Agency Notification No.59,1971 Appendix table 3 GC(ECD)	0.0005 mg/L
Organochlorine compounds	N.D	Environment Agency Notification No.14,1973 Appendix table 1 Absorption spectrophotometry	4 mg/kg-Wet
Copper and its compounds	N.D	JIS K0102(2008) 52.5 ICP/MS	0.02 mg/L
Zinc and its compounds	0.087 mg/L	JIS K0102(2008) 53.4 ICP/MS	0.005 mg/L

「N.D」indicates values below the determination limit

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Analysis	Results	Instrument	Determination limit
Fluorides	N.D	JIS K0102(2008) 34.1 Absorption spectrophotometry	0.1 mg/L
Trichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Tetrachloroethylene	N.D	JIS K0102 5.2 HS-GC/MS	0.0005 mg/L
Beryllium and its compounds	N.D	Environment Agency Notification No.13,1973 Appendix table 7-3 ICP/AES	0.05 mg/L
Chromium and its compounds	N.D	JIS K0102(2008) 65.1.5 ICP/MS	0.04 mg/L
Nickel and its compounds	N.D	JIS K0102(2008) 59.3 ICP/AES	0.01 mg/L
Vanadium and its compounds	N.D	JIS K0102(2008) 70.4 ICP/AES	0.01 mg/L
Dichloromethane	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Carbon tetrachloride	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
1,2-dichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0004 mg/L
1,1-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Cis-1,2-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.004 mg/L
1,1,1-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0005 mg/L
1,1,2-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0006 mg/L
1,3-dichloropropene	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
Thiuram	N.D	Environment Agency Notification No.59,1971 Appendix table 4 HPLC	0.0006 mg/L
Simazine	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.0003 mg/L
Thiobencarb	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.002 mg/L
Benzene	N.D	JIS K0125 5.2 HS-GC/MS	0.001 mg/L
Selenium and its compounds	N.D	JIS K0102(2008) 67.2 HG-AAS	0.002 mg/L
1,4-dioxane	N.D	Environment Agency Notification No.59,1971 Appendix table 7-3 HS-GC/MS	0.05 mg/L
Water content	20.7 %-Wet	Gravimetric analysis	0.1 %-Wet

「N.D」indicates values below the determination limit

Test Report

№ 81500627
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ISSUE DATE 3-Dec-14

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Laboratory Co-ordinater Katsuya Toda

Test name	Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh
Sample name	D-4
Sampling execution	Submitted by client
Sample No.	74330102-3
Date of analysis	25-Nov-14
Special mention	Sampling place:Matarbari,Maheshkhali Upazila,Cox's Bazar District,Dhaka Division,Bangladesh

Analysis item	Result	Unit	Method
POLYCHLORINATED DIBENZO-ρ-DIOXINS(PCDDs)	3.8	pg/L	Environment Agency Notification No.68,2003 (JIS K 0312:2008)
POLYCHLORINATED DIBENZOFURANS (PCDFs)	ND		
CO-PLANAR POLYCHLORINATED BIPHENYLS (Co-PCBs)	3.9	pg/L	
2,3,7,8-TCDD toxicity equivalents	0.0012	pg-TEQ/L	

[NOTE]
Used WHO-IPCS(2006) as TEF

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Table of dioxins concentration analysis results

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ISSUE DATE 3-Dec-14

Sample name D-4

Components of quantitation target		Survey concentration (pg/L)	Detection limit (pg/L)	Detection limit (pg/L)	Toxicity Equivalency Factor	2,3,7,8-TCDD toxicity equivalent (pg-TEQ/L)
PCDDs	1,3,6,8-TeCDD	ND	0.10	0.03	0	0
	1,3,7,9-TeCDD	ND	0.3	0.1	0	0
	2,3,7,8-TeCDD	ND	0.14	0.04	1	0
	TeCDDs	ND	-	-	-	-
	1,2,3,7,8-PeCDD	ND	0.12	0.04	1	0
	PeCDDs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDD	ND	0.5	0.2	0.1	0
	1,2,3,6,7,8-HxCDD	ND	0.5	0.1	0.1	0
	1,2,3,7,8,9-HxCDD	ND	0.28	0.08	0.1	0
	HxCDDs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDD	ND	0.6	0.2	0.01	0
	HpCDDs	ND	-	-	-	-
	OCDD	3.8	1.1	0.3	0.0003	0.00114
	Total PCDDs	3.8	-	-	-	0.00114
PCDFs	1,2,7,8-TeCDF	ND	0.7	0.2	0	0
	2,3,7,8-TeCDF	ND	0.5	0.1	0.1	0
	TeCDFs	ND	-	-	-	-
	1,2,3,7,8-PeCDF	ND	0.25	0.08	0.03	0
	2,3,4,7,8-PeCDF	ND	0.21	0.06	0.3	0
	PeCDFs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDF	ND	0.3	0.1	0.1	0
	1,2,3,6,7,8-HxCDF	ND	0.4	0.1	0.1	0
	1,2,3,7,8,9-HxCDF	ND	0.4	0.1	0.1	0
	2,3,4,6,7,8-HxCDF	ND	0.27	0.08	0.1	0
	HxCDFs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDF	ND	0.7	0.2	0.01	0
	1,2,3,4,7,8,9-HpCDF	ND	0.9	0.3	0.01	0
	HpCDFs	ND	-	-	-	-
	OCDF	ND	1.9	0.6	0.0003	0
	Total PCDFs	ND	-	-	-	0
Total PCDDs+PCDFs		3.8	-	-	-	0.00114
Co-PCBs	3,3',4,4'-TeCB(#77)	(0.4)	0.6	0.2	0.0001	0
	3,4,4',5-TeCB(#81)	ND	0.6	0.2	0.0003	0
	3,3',4,4',5-PeCB(#126)	ND	0.13	0.04	0.1	0
	3,3',4,4',5,5'-HxCB(#169)	ND	0.32	0.09	0.03	0
	Total non-orthoCBs	0.40	-	-	-	0
	2,3,3',4,4'-PeCB(#105)	0.74	0.19	0.06	0.00003	0.0000222
	2,3,4,4',5-PeCB(#114)	ND	0.6	0.2	0.00003	0
	2,3',4,4',5-PeCB(#118)	2.2	0.9	0.3	0.00003	0.000066
	2',3,4,4',5-PeCB(#123)	ND	0.6	0.2	0.00003	0
	2,3,3',4,4',5-HxCB(#156)	(0.4)	0.5	0.1	0.00003	0
	2,3,3',4,4',5'-HxCB(#157)	ND	0.9	0.3	0.00003	0
	2,3',4,4',5,5'-HxCB(#167)	(0.2)	0.6	0.2	0.00003	0
	2,3,3',4,4',5,5'-HpCB(#189)	ND	0.6	0.2	0.00003	0
	Total mono-orthoCBs	3.5	-	-	-	0.0000882
Total Co-PCBs		3.9	-	-	-	0.0000882
Total PCDDs+PCDFs+Co-PCBs		7.7	-	-	-	0.0012

Note

① Used WHO-IPCS(2006) as TEF

② The numerical value with a parenthesis indicates the concentration of more than a minimum limit of detection and less than a determination limit.

③ "ND"in survey concentration describes under detection limit.

④ Values in parenthesis are below quantitation limit but greater or equal to detection limit.

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No. 81500042 -1-1/2

8-October-2014

Test Report

Client

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Results of analysis are reported as follows:

Sampling date	30-August-2014
Sample received	12-September-2014
Sampling person	Client

Laboratory co-ordinater Masafumi Yoshikawa

Sample name	SPT-2
Sample category	Dredge soil
Special mention	Elution test ; Environment Agency Notification No.14,1973 Subject : Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh Sampling site : Matarbari,Maheshkhali Upazila, Cox's Bazar District, Dhaka Division, Bangladesh

Analysis	Results	Instrument	Determination limit
Alkyl mercury compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 2 GC(ECD)	0.0005 mg/L
Mercury and its compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 1 R-AAS	0.0005 mg/L
Cadmium and its compounds	N.D	JIS K0102(2008) 55.4 ICP/MS	0.001 mg/L
Lead and its compounds	N.D	JIS K0102(2008) 54.4 ICP/MS	0.01 mg/L
Organic phosphorous compounds	N.D	Environment Agency Notification No.64,1974 Appendix table 1 GC(FPD)	0.1 mg/L
Chromium(VI) compounds	N.D	JIS K0102(2008) 65.2.1 Absorption spectrophotometry	0.04 mg/L
Arsenic and its compounds	0.005 mg/L	JIS K0102(2008) 61.2 HG-AAS	0.005 mg/L
Cyanides	N.D	JIS K0102(2008) 38.3 Absorption spectrophotometry	0.1 mg/L
Polychlorinated biphenyls(PCBs)	N.D	Environment Agency Notification No.59,1971 Appendix table 3 GC(ECD)	0.0005 mg/L
Organochlorine compounds	N.D	Environment Agency Notification No.14,1973 Appendix table 1 Absorption spectrophotometry	4 mg/kg-Wet
Copper and its compounds	N.D	JIS K0102(2008) 52.5 ICP/MS	0.02 mg/L
Zinc and its compounds	N.D	JIS K0102(2008) 53.4 ICP/MS	0.005 mg/L

「N.D」indicates values below the determination limit

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Analysis	Results	Instrument	Determination limit
Fluorides	0.2 mg/L	JIS K0102(2008) 34.1 Absorption spectrophotometry	0.1 mg/L
Trichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Tetrachloroethylene	N.D	JIS K0102 5.2 HS-GC/MS	0.0005 mg/L
Beryllium and its compounds	N.D	Environment Agency Notification No.13,1973 Appendix table 7-3 ICP/AES	0.05 mg/L
Chromium and its compounds	N.D	JIS K0102(2008) 65.1.5 ICP/MS	0.04 mg/L
Nickel and its compounds	N.D	JIS K0102(2008) 59.3 ICP/AES	0.01 mg/L
Vanadium and its compounds	0.02 mg/L	JIS K0102(2008) 70.4 ICP/AES	0.01 mg/L
Dichloromethane	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Carbon tetrachloride	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
1,2-dichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0004 mg/L
1,1-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Cis-1,2-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.004 mg/L
1,1,1-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0005 mg/L
1,1,2-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0006 mg/L
1,3-dichloropropene	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
Thiuram	N.D	Environment Agency Notification No.59,1971 Appendix table 4 HPLC	0.0006 mg/L
Simazine	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.0003 mg/L
Thiobencarb	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.002 mg/L
Benzene	N.D	JIS K0125 5.2 HS-GC/MS	0.001 mg/L
Selenium and its compounds	0.004 mg/L	JIS K0102(2008) 67.2 HG-AAS	0.002 mg/L
1,4-dioxane	N.D	Environment Agency Notification No.59,1971 Appendix table 7-3 HS-GC/MS	0.05 mg/L
Water content	29.2 %-Wet	Gravimetric analysis	0.1 %-Wet

「N.D」indicates values below the determination limit

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Test Report

№ 81500162
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ISSUE DATE 16-Oct-14

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Laboratory Co-ordinater Katsuya Toda

Test name	Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh
Sample name	SPT-2
Sampling execution	Submitted by client
Sample No.	74230842-1
Date of analysis	6-Oct-14
Special mention	Sampling place:Matarbari,Maheshkhali Upazila,Cox's Bazar District,Dhaka Division,Bangladesh

Analysis item	Result	Unit	Method
POLYCHLORINATED DIBENZO-p-DIOXINS(PCDDs)	9.5	pg/L	Environment Agency Notification No.68,2003 (JIS K 0312:2008)
POLYCHLORINATED DIBENZOFURANS (PCDFs)	0.20	pg/L	
CO-PLANAR POLYCHLORINATED BIPHENYLS (Co-PCBs)	11	pg/L	
2,3,7,8-TCDD toxicity equivalents	0.012	pg-TEQ/L	

[NOTE]
Used WHO-IPCS(2006) as TEF

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Table of dioxins concentration analysis results

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Sample name SPT-2

Components of quantitation target		Survey concentration (pg/L)	Detection limit (pg/L)	Detection limit (pg/L)	Toxicity Equivalency Factor	2,3,7,8-TCDD toxicity equivalent (pg-TEQ/L)
PCDDs	1,3,6,8-TeCDD	ND	0.11	0.03	0	0
	1,3,7,9-TeCDD	ND	0.4	0.1	0	0
	2,3,7,8-TeCDD	ND	0.15	0.05	1	0
	TeCDDs	ND	-	-	-	-
	1,2,3,7,8-PeCDD	ND	0.12	0.04	1	0
	PeCDDs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDD	ND	0.6	0.2	0.1	0
	1,2,3,6,7,8-HxCDD	ND	0.5	0.1	0.1	0
	1,2,3,7,8,9-HxCDD	ND	0.30	0.09	0.1	0
	HxCDDs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDD	1.0	0.7	0.2	0.01	0.01
	HpCDDs	2.6	-	-	-	-
	OCDD	6.9	1.1	0.3	0.0003	0.00207
	Total PCDDs	9.5	-	-	-	0.01207
PCDFs	1,2,7,8-TeCDF	ND	0.7	0.2	0	0
	2,3,7,8-TeCDF	ND	0.5	0.2	0.1	0
	TeCDFs	0.2	-	-	-	-
	1,2,3,7,8-PeCDF	ND	0.27	0.08	0.03	0
	2,3,4,7,8-PeCDF	ND	0.22	0.07	0.3	0
	PeCDFs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDF	ND	0.3	0.1	0.1	0
	1,2,3,6,7,8-HxCDF	ND	0.4	0.1	0.1	0
	1,2,3,7,8,9-HxCDF	ND	0.4	0.1	0.1	0
	2,3,4,6,7,8-HxCDF	ND	0.28	0.08	0.1	0
	HxCDFs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDF	ND	0.7	0.2	0.01	0
	1,2,3,4,7,8,9-HpCDF	ND	1.0	0.3	0.01	0
	HpCDFs	ND	-	-	-	-
	OCDF	ND	2.0	0.6	0.0003	0
	Total PCDFs	0.20	-	-	-	0
Total PCDDs+PCDFs		9.7	-	-	-	0.01207
Co-PCBs	3,3',4,4'-TeCB(#77)	(0.5)	0.6	0.2	0.0001	0
	3,4,4',5-TeCB(#81)	ND	0.6	0.2	0.0003	0
	3,3',4,4',5-PeCB(#126)	ND	0.14	0.04	0.1	0
	3,3',4,4',5,5'-HxCB(#169)	ND	0.3	0.1	0.03	0
	Total non-orthoCBs	0.50	-	-	-	0
	2,3,3',4,4'-PeCB(#105)	1.6	0.20	0.06	0.00003	0.000048
	2,3,4,4',5-PeCB(#114)	ND	0.6	0.2	0.00003	0
	2,3',4,4',5-PeCB(#118)	5.2	0.9	0.3	0.00003	0.000156
	2',3,4,4',5-PeCB(#123)	ND	0.7	0.2	0.00003	0
	2,3,3',4,4',5-HxCB(#156)	2.1	0.5	0.1	0.00003	0.000063
	2,3,3',4,4',5'-HxCB(#157)	(0.3)	1.0	0.3	0.00003	0
	2,3',4,4',5,5'-HxCB(#167)	0.9	0.6	0.2	0.00003	0.000027
	2,3,3',4,4',5,5'-HpCB(#189)	ND	0.6	0.2	0.00003	0
	Total mono-orthoCBs	10	-	-	-	0.000294
Total Co-PCBs		11	-	-	-	0.000294
Total PCDDs+PCDFs+Co-PCBs		20	-	-	-	0.012

Note

① Used WHO-IPCS(2006) as TEF

② The numerical value with a parenthesis indicates the concentration of more than a minimum limit of detection and less than a determination limit.

③ "ND"in survey concentration describes under detection limit.

④ Values in parenthesis are below quantitation limit but greater or equal to detection limit.

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No. 81500043 -1-1/2

8-October-2014

Test Report

Client

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Results of analysis are reported as follows:

Sampling date	31-August-2014
Sample received	12-September-2014
Sampling person	Client

Laboratory co-ordinater Masafumi Yoshikawa

Sample name	D-3
Sample category	Dredge soil
Special mention	Elution test ; Environment Agency Notification No.14,1973 Subject : Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh Sampling site : Matarbari,Maheshkhali Upazila, Cox's Bazar District, Dhaka Division, Bangladesh

Analysis	Results	Instrument	Determination limit
Alkyl mercury compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 2 GC(ECD)	0.0005 mg/L
Mercury and its compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 1 R-AAS	0.0005 mg/L
Cadmium and its compounds	N.D	JIS K0102(2008) 55.4 ICP/MS	0.001 mg/L
Lead and its compounds	N.D	JIS K0102(2008) 54.4 ICP/MS	0.01 mg/L
Organic phosphorous compounds	N.D	Environment Agency Notification No.64,1974 Appendix table 1 GC(FPD)	0.1 mg/L
Chromium(VI) compounds	N.D	JIS K0102(2008) 65.2.1 Absorption spectrophotometry	0.04 mg/L
Arsenic and its compounds	N.D	JIS K0102(2008) 61.2 HG-AAS	0.005 mg/L
Cyanides	N.D	JIS K0102(2008) 38.3 Absorption spectrophotometry	0.1 mg/L
Polychlorinated biphenyls(PCBs)	N.D	Environment Agency Notification No.59,1971 Appendix table 3 GC(ECD)	0.0005 mg/L
Organochlorine compounds	N.D	Environment Agency Notification No.14,1973 Appendix table 1 Absorption spectrophotometry	4 mg/kg-Wet
Copper and its compounds	N.D	JIS K0102(2008) 52.5 ICP/MS	0.02 mg/L
Zinc and its compounds	0.008 mg/L	JIS K0102(2008) 53.4 ICP/MS	0.005 mg/L

「N.D」indicates values below the determination limit

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Analysis	Results	Instrument	Determination limit
Fluorides	N.D	JIS K0102(2008) 34.1 Absorption spectrophotometry	0.1 mg/L
Trichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Tetrachloroethylene	N.D	JIS K0102 5.2 HS-GC/MS	0.0005 mg/L
Beryllium and its compounds	N.D	Environment Agency Notification No.13,1973 Appendix table 7-3 ICP/AES	0.05 mg/L
Chromium and its compounds	N.D	JIS K0102(2008) 65.1.5 ICP/MS	0.04 mg/L
Nickel and its compounds	N.D	JIS K0102(2008) 59.3 ICP/AES	0.01 mg/L
Vanadium and its compounds	0.01 mg/L	JIS K0102(2008) 70.4 ICP/AES	0.01 mg/L
Dichloromethane	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Carbon tetrachloride	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
1,2-dichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0004 mg/L
1,1-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Cis-1,2-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.004 mg/L
1,1,1-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0005 mg/L
1,1,2-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0006 mg/L
1,3-dichloropropene	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
Thiuram	N.D	Environment Agency Notification No.59,1971 Appendix table 4 HPLC	0.0006 mg/L
Simazine	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.0003 mg/L
Thiobencarb	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.002 mg/L
Benzene	N.D	JIS K0125 5.2 HS-GC/MS	0.001 mg/L
Selenium and its compounds	0.002 mg/L	JIS K0102(2008) 67.2 HG-AAS	0.002 mg/L
1,4-dioxane	N.D	Environment Agency Notification No.59,1971 Appendix table 7-3 HS-GC/MS	0.05 mg/L
Water content	23.9 %-Wet	Gravimetric analysis	0.1 %-Wet

「N.D」 indicates values below the determination limit

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Test Report

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ISSUE DATE 16-Oct-14

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Laboratory Co-ordinater Katsuya Toda

Test name	Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh
Sample name	D-3
Sampling execution	Submitted by client
Sample No.	74230842-2
Date of analysis	11-Oct-14
Special mention	Sampling place:Matarbari,Maheshkhali Upazila,Cox's Bazar District,Dhaka Division,Bangladesh

Analysis item	Result	Unit	Method
POLYCHLORINATED DIBENZO-p-DIOXINS(PCDDs)	1.6	pg/L	Environment Agency Notification No.68,2003 (JIS K 0312:2008)
POLYCHLORINATED DIBENZOFURANS (PCDFs)	ND		
CO-PLANAR POLYCHLORINATED BIPHENYLS (Co-PCBs)	3.8	pg/L	
2,3,7,8-TCDD toxicity equivalents	0.00058	pg-TEQ/L	

[NOTE]
Used WHO-IPCS(2006) as TEF

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Table of dioxins concentration analysis results

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Sample name D-3

Components of quantitation target		Survey concentration (pg/L)	Detection limit (pg/L)	Detection limit (pg/L)	Toxicity Equivalency Factor	2,3,7,8-TCDD toxicity equivalent (pg-TEQ/L)
PCDDs	1,3,6,8-TeCDD	ND	0.10	0.03	0	0
	1,3,7,9-TeCDD	ND	0.3	0.1	0	0
	2,3,7,8-TeCDD	ND	0.14	0.04	1	0
	TeCDDs	ND	-	-	-	-
	1,2,3,7,8-PeCDD	ND	0.12	0.04	1	0
	PeCDDs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDD	ND	0.5	0.2	0.1	0
	1,2,3,6,7,8-HxCDD	ND	0.5	0.1	0.1	0
	1,2,3,7,8,9-HxCDD	ND	0.28	0.08	0.1	0
	HxCDDs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDD	ND	0.6	0.2	0.01	0
	HpCDDs	ND	-	-	-	-
	OCDD	1.6	1.1	0.3	0.0003	0.00048
	Total PCDDs	1.6	-	-	-	0.00048
PCDFs	1,2,7,8-TeCDF	ND	0.7	0.2	0	0
	2,3,7,8-TeCDF	ND	0.5	0.1	0.1	0
	TeCDFs	ND	-	-	-	-
	1,2,3,7,8-PeCDF	ND	0.25	0.08	0.03	0
	2,3,4,7,8-PeCDF	ND	0.21	0.06	0.3	0
	PeCDFs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDF	ND	0.3	0.1	0.1	0
	1,2,3,6,7,8-HxCDF	ND	0.4	0.1	0.1	0
	1,2,3,7,8,9-HxCDF	ND	0.4	0.1	0.1	0
	2,3,4,6,7,8-HxCDF	ND	0.27	0.08	0.1	0
	HxCDFs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDF	ND	0.7	0.2	0.01	0
	1,2,3,4,7,8,9-HpCDF	ND	0.9	0.3	0.01	0
	HpCDFs	ND	-	-	-	-
	OCDF	ND	1.9	0.6	0.0003	0
	Total PCDFs	ND	-	-	-	0
Total PCDDs+PCDFs		1.6	-	-	-	0.00048
Co-PCBs	3,3',4,4'-TeCB(#77)	(0.2)	0.6	0.2	0.0001	0
	3,4,4',5-TeCB(#81)	ND	0.6	0.2	0.0003	0
	3,3',4,4',5-PeCB(#126)	ND	0.13	0.04	0.1	0
	3,3',4,4',5,5'-HxCB(#169)	ND	0.32	0.09	0.03	0
	Total non-orthoCBs	0.20	-	-	-	0
	2,3,3',4,4'-PeCB(#105)	0.62	0.19	0.06	0.00003	0.0000186
	2,3,4,4',5-PeCB(#114)	ND	0.6	0.2	0.00003	0
	2,3',4,4',5-PeCB(#118)	2.1	0.9	0.3	0.00003	0.000063
	2',3,4,4',5-PeCB(#123)	ND	0.6	0.2	0.00003	0
	2,3,3',4,4',5-HxCB(#156)	0.7	0.5	0.1	0.00003	0.000021
	2,3,3',4,4',5'-HxCB(#157)	ND	0.9	0.3	0.00003	0
	2,3',4,4',5,5'-HxCB(#167)	(0.2)	0.6	0.2	0.00003	0
	2,3,3',4,4',5,5'-HpCB(#189)	ND	0.6	0.2	0.00003	0
	Total mono-orthoCBs	3.6	-	-	-	0.0001026
Total Co-PCBs		3.8	-	-	-	0.0001026
Total PCDDs+PCDFs+Co-PCBs		5.4	-	-	-	0.00058

Note

① Used WHO-IPCS(2006) as TEF

② The numerical value with a parenthesis indicates the concentration of more than a minimum limit of detection and less than a determination limit.

③ "ND"in survey concentration describes under detection limit.

④ Values in parenthesis are below quantitation limit but greater or equal to detection limit.

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No. 81500044 -1-1/2

8-October-2014

Test Report

Client

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Results of analysis are reported as follows:

Sampling date	1-September-2014
Sample received	12-September-2014
Sampling person	Client

Laboratory co-ordinater Masafumi Yoshikawa

Sample name	SPT-10
Sample category	Dredge soil
Special mention	Elution test ; Environment Agency Notification No.14,1973 Subject : Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh Sampling site : Matarbari,Maheshkhali Upazila, Cox's Bazar District, Dhaka Division, Bangladesh

Analysis	Results	Instrument	Determination limit
Alkyl mercury compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 2 GC(ECD)	0.0005 mg/L
Mercury and its compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 1 R-AAS	0.0005 mg/L
Cadmium and its compounds	N.D	JIS K0102(2008) 55.4 ICP/MS	0.001 mg/L
Lead and its compounds	N.D	JIS K0102(2008) 54.4 ICP/MS	0.01 mg/L
Organic phosphorous compounds	N.D	Environment Agency Notification No.64,1974 Appendix table 1 GC(FPD)	0.1 mg/L
Chromium(VI) compounds	N.D	JIS K0102(2008) 65.2.1 Absorption spectrophotometry	0.04 mg/L
Arsenic and its compounds	0.007 mg/L	JIS K0102(2008) 61.2 HG-AAS	0.005 mg/L
Cyanides	N.D	JIS K0102(2008) 38.3 Absorption spectrophotometry	0.1 mg/L
Polychlorinated biphenyls(PCBs)	N.D	Environment Agency Notification No.59,1971 Appendix table 3 GC(ECD)	0.0005 mg/L
Organochlorine compounds	N.D	Environment Agency Notification No.14,1973 Appendix table 1 Absorption spectrophotometry	4 mg/kg-Wet
Copper and its compounds	N.D	JIS K0102(2008) 52.5 ICP/MS	0.02 mg/L
Zinc and its compounds	N.D	JIS K0102(2008) 53.4 ICP/MS	0.005 mg/L

「N.D」indicates values below the determination limit

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Analysis	Results	Instrument	Determination limit
Fluorides	N.D	JIS K0102(2008) 34.1 Absorption spectrophotometry	0.1 mg/L
Trichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Tetrachloroethylene	N.D	JIS K0102 5.2 HS-GC/MS	0.0005 mg/L
Beryllium and its compounds	N.D	Environment Agency Notification No.13,1973 Appendix table 7-3 ICP/AES	0.05 mg/L
Chromium and its compounds	N.D	JIS K0102(2008) 65.1.5 ICP/MS	0.04 mg/L
Nickel and its compounds	N.D	JIS K0102(2008) 59.3 ICP/AES	0.01 mg/L
Vanadium and its compounds	0.02 mg/L	JIS K0102(2008) 70.4 ICP/AES	0.01 mg/L
Dichloromethane	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Carbon tetrachloride	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
1,2-dichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0004 mg/L
1,1-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Cis-1,2-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.004 mg/L
1,1,1-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0005 mg/L
1,1,2-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0006 mg/L
1,3-dichloropropene	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
Thiuram	N.D	Environment Agency Notification No.59,1971 Appendix table 4 HPLC	0.0006 mg/L
Simazine	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.0003 mg/L
Thiobencarb	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.002 mg/L
Benzene	N.D	JIS K0125 5.2 HS-GC/MS	0.001 mg/L
Selenium and its compounds	N.D	JIS K0102(2008) 67.2 HG-AAS	0.002 mg/L
1,4-dioxane	N.D	Environment Agency Notification No.59,1971 Appendix table 7-3 HS-GC/MS	0.05 mg/L
Water content	25.3 %-Wet	Gravimetric analysis	0.1 %-Wet

「N.D」indicates values below the determination limit

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Test Report

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Laboratory Co-ordinater Katsuya Toda

Test name	Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh
Sample name	SPT-10
Sampling execution	Submitted by client
Sample No.	74230842-3
Date of analysis	10-Oct-14
Special mention	Sampling place:Matarbari,Maheshkhali Upazila,Cox's Bazar District,Dhaka Division,Bangladesh

Analysis item	Result	Unit	Method
POLYCHLORINATED DIBENZO-p-DIOXINS(PCDDs)	18	pg/L	Environment Agency Notification No.68,2003 (JIS K 0312:2008)
POLYCHLORINATED DIBENZOFURANS (PCDFs)	ND		
CO-PLANAR POLYCHLORINATED BIPHENYLS (Co-PCBs)	9.5	pg/L	
2,3,7,8-TCDD toxicity equivalents	0.018	pg-TEQ/L	

[NOTE]
Used WHO-IPCS(2006) as TEF

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Table of dioxins concentration analysis results

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Sample name SPT-10

Components of quantitation target		Survey concentration (pg/L)	Detection limit (pg/L)	Detection limit (pg/L)	Toxicity Equivalency Factor	2,3,7,8-TCDD toxicity equivalent (pg-TEQ/L)
PCDDs	1,3,6,8-TeCDD	ND	0.11	0.03	0	0
	1,3,7,9-TeCDD	ND	0.4	0.1	0	0
	2,3,7,8-TeCDD	ND	0.15	0.04	1	0
	TeCDDs	ND	-	-	-	-
	1,2,3,7,8-PeCDD	ND	0.12	0.04	1	0
	PeCDDs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDD	ND	0.5	0.2	0.1	0
	1,2,3,6,7,8-HxCDD	ND	0.5	0.1	0.1	0
	1,2,3,7,8,9-HxCDD	ND	0.29	0.09	0.1	0
	HxCDDs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDD	1.4	0.7	0.2	0.01	0.014
	HpCDDs	4.3	-	-	-	-
	OCDD	14	1.1	0.3	0.0003	0.0042
	Total PCDDs	18	-	-	-	0.0182
PCDFs	1,2,7,8-TeCDF	ND	0.7	0.2	0	0
	2,3,7,8-TeCDF	ND	0.5	0.2	0.1	0
	TeCDFs	ND	-	-	-	-
	1,2,3,7,8-PeCDF	ND	0.26	0.08	0.03	0
	2,3,4,7,8-PeCDF	ND	0.21	0.06	0.3	0
	PeCDFs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDF	ND	0.3	0.1	0.1	0
	1,2,3,6,7,8-HxCDF	ND	0.4	0.1	0.1	0
	1,2,3,7,8,9-HxCDF	ND	0.4	0.1	0.1	0
	2,3,4,6,7,8-HxCDF	ND	0.27	0.08	0.1	0
	HxCDFs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDF	ND	0.7	0.2	0.01	0
	1,2,3,4,7,8,9-HpCDF	ND	0.9	0.3	0.01	0
	HpCDFs	ND	-	-	-	-
	OCDF	ND	2.0	0.6	0.0003	0
	Total PCDFs	ND	-	-	-	0
Total PCDDs+PCDFs		18	-	-	-	0.0182
Co-PCBs	3,3',4,4'-TeCB(#77)	(0.5)	0.6	0.2	0.0001	0
	3,4,4',5-TeCB(#81)	ND	0.6	0.2	0.0003	0
	3,3',4,4',5-PeCB(#126)	ND	0.13	0.04	0.1	0
	3,3',4,4',5,5'-HxCB(#169)	ND	0.3	0.1	0.03	0
	Total non-orthoCBs	0.50	-	-	-	0
	2,3,3',4,4'-PeCB(#105)	1.3	0.20	0.06	0.00003	0.000039
	2,3,4,4',5-PeCB(#114)	ND	0.6	0.2	0.00003	0
	2,3',4,4',5-PeCB(#118)	4.6	0.9	0.3	0.00003	0.000138
	2',3,4,4',5-PeCB(#123)	ND	0.7	0.2	0.00003	0
	2,3,3',4,4',5-HxCB(#156)	1.5	0.5	0.1	0.00003	0.000045
	2,3,3',4,4',5'-HxCB(#157)	(0.3)	0.9	0.3	0.00003	0
	2,3',4,4',5,5'-HxCB(#167)	0.9	0.6	0.2	0.00003	0.000027
	2,3,3',4,4',5,5'-HpCB(#189)	(0.4)	0.6	0.2	0.00003	0
	Total mono-orthoCBs	9.0	-	-	-	0.000249
Total Co-PCBs		9.5	-	-	-	0.000249
Total PCDDs+PCDFs+Co-PCBs		28	-	-	-	0.018

Note

① Used WHO-IPCS(2006) as TEF

② The numerical value with a parenthesis indicates the concentration of more than a minimum limit of detection and less than a determination limit.

③ "ND"in survey concentration describes under detection limit.

④ Values in parenthesis are below quantitation limit but greater or equal to detection limit.

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No. 81500045 -1-1/2

8-October-2014

Test Report

Client

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Results of analysis are reported as follows:

Sampling date	1-September-2014
Sample received	12-September-2014
Sampling person	Client

Laboratory co-ordinater Masafumi Yoshikawa

Sample name	D-5
Sample category	Dredge soil
Special mention	Elution test ; Environment Agency Notification No.14,1973 Subject : Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh Sampling site : Matarbari,Maheshkhali Upazila, Cox's Bazar District, Dhaka Division, Bangladesh

Analysis	Results	Instrument	Determination limit
Alkyl mercury compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 2 GC(ECD)	0.0005 mg/L
Mercury and its compounds	N.D	Environment Agency Notification No.59,1971 Appendix table 1 R-AAS	0.0005 mg/L
Cadmium and its compounds	N.D	JIS K0102(2008) 55.4 ICP/MS	0.001 mg/L
Lead and its compounds	N.D	JIS K0102(2008) 54.4 ICP/MS	0.01 mg/L
Organic phosphorous compounds	N.D	Environment Agency Notification No.64,1974 Appendix table 1 GC(FPD)	0.1 mg/L
Chromium(VI) compounds	N.D	JIS K0102(2008) 65.2.1 Absorption spectrophotometry	0.04 mg/L
Arsenic and its compounds	0.012 mg/L	JIS K0102(2008) 61.2 HG-AAS	0.005 mg/L
Cyanides	N.D	JIS K0102(2008) 38.3 Absorption spectrophotometry	0.1 mg/L
Polychlorinated biphenyls(PCBs)	N.D	Environment Agency Notification No.59,1971 Appendix table 3 GC(ECD)	0.0005 mg/L
Organochlorine compounds	N.D	Environment Agency Notification No.14,1973 Appendix table 1 Absorption spectrophotometry	4 mg/kg-Wet
Copper and its compounds	N.D	JIS K0102(2008) 52.5 ICP/MS	0.02 mg/L
Zinc and its compounds	N.D	JIS K0102(2008) 53.4 ICP/MS	0.005 mg/L

「N.D」indicates values below the determination limit

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Analysis	Results	Instrument	Determination limit
Fluorides	N.D	JIS K0102(2008) 34.1 Absorption spectrophotometry	0.1 mg/L
Trichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Tetrachloroethylene	N.D	JIS K0102 5.2 HS-GC/MS	0.0005 mg/L
Beryllium and its compounds	N.D	Environment Agency Notification No.13,1973 Appendix table 7-3 ICP/AES	0.05 mg/L
Chromium and its compounds	N.D	JIS K0102(2008) 65.1.5 ICP/MS	0.04 mg/L
Nickel and its compounds	N.D	JIS K0102(2008) 59.3 ICP/AES	0.01 mg/L
Vanadium and its compounds	0.03 mg/L	JIS K0102(2008) 70.4 ICP/AES	0.01 mg/L
Dichloromethane	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Carbon tetrachloride	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
1,2-dichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0004 mg/L
1,1-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.002 mg/L
Cis-1,2-dichloroethylene	N.D	JIS K0125 5.2 HS-GC/MS	0.004 mg/L
1,1,1-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0005 mg/L
1,1,2-trichloroethane	N.D	JIS K0125 5.2 HS-GC/MS	0.0006 mg/L
1,3-dichloropropene	N.D	JIS K0125 5.2 HS-GC/MS	0.0002 mg/L
Thiuram	N.D	Environment Agency Notification No.59,1971 Appendix table 4 HPLC	0.0006 mg/L
Simazine	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.0003 mg/L
Thiobencarb	N.D	Environment Agency Notification No.59,1971 Appendix table 5-1 GC/MS	0.002 mg/L
Benzene	N.D	JIS K0125 5.2 HS-GC/MS	0.001 mg/L
Selenium and its compounds	N.D	JIS K0102(2008) 67.2 HG-AAS	0.002 mg/L
1,4-dioxane	N.D	Environment Agency Notification No.59,1971 Appendix table 7-3 HS-GC/MS	0.05 mg/L
Water content	22.8 %-Wet	Gravimetric analysis	0.1 %-Wet

「N.D」indicates values below the determination limit

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Test Report

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Laboratory Co-ordinater Katsuya Toda

Test name	Preparatory Survey on Matarbari USC Coal-fired Power Project,Bangladesh
Sample name	D-5
Sampling execution	Submitted by client
Sample No.	74230842-4
Date of analysis	9-Oct-14
Special mention	Sampling place:Matarbari,Maheshkhali Upazila,Cox's Bazar District,Dhaka Division,Bangladesh

Analysis item	Result	Unit	Method
POLYCHLORINATED DIBENZO-p-DIOXINS(PCDDs)	1.7	pg/L	Environment Agency Notification No.68,2003 (JIS K 0312:2008)
POLYCHLORINATED DIBENZOFURANS (PCDFs)	1.0	pg/L	
CO-PLANAR POLYCHLORINATED BIPHENYLS (Co-PCBs)	3.3	pg/L	
2,3,7,8-TCDD toxicity equivalents	0.000087	pg-TEQ/L	

[NOTE]
Used WHO-IPCS(2006) as TEF

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Table of dioxins concentration analysis results

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Sample name D-5

Components of quantitation target		Survey concentration (pg/L)	Detection limit (pg/L)	Detection limit (pg/L)	Toxicity Equivalency Factor	2,3,7,8-TCDD toxicity equivalent (pg-TEQ/L)
PCDDs	1,3,6,8-TeCDD	ND	0.10	0.03	0	0
	1,3,7,9-TeCDD	ND	0.3	0.1	0	0
	2,3,7,8-TeCDD	ND	0.14	0.04	1	0
	TeCDDs	0.76	-	-	-	-
	1,2,3,7,8-PeCDD	ND	0.11	0.03	1	0
	PeCDDs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDD	ND	0.5	0.2	0.1	0
	1,2,3,6,7,8-HxCDD	ND	0.4	0.1	0.1	0
	1,2,3,7,8,9-HxCDD	ND	0.27	0.08	0.1	0
	HxCDDs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDD	ND	0.6	0.2	0.01	0
	HpCDDs	ND	-	-	-	-
	OCDD	(0.9)	1.0	0.3	0.0003	0
	Total PCDDs	1.7	-	-	-	0
PCDFs	1,2,7,8-TeCDF	ND	0.7	0.2	0	0
	2,3,7,8-TeCDF	ND	0.5	0.1	0.1	0
	TeCDFs	1.0	-	-	-	-
	1,2,3,7,8-PeCDF	ND	0.24	0.07	0.03	0
	2,3,4,7,8-PeCDF	ND	0.20	0.06	0.3	0
	PeCDFs	ND	-	-	-	-
	1,2,3,4,7,8-HxCDF	ND	0.31	0.09	0.1	0
	1,2,3,6,7,8-HxCDF	ND	0.4	0.1	0.1	0
	1,2,3,7,8,9-HxCDF	ND	0.4	0.1	0.1	0
	2,3,4,6,7,8-HxCDF	ND	0.25	0.08	0.1	0
	HxCDFs	ND	-	-	-	-
	1,2,3,4,6,7,8-HpCDF	ND	0.6	0.2	0.01	0
	1,2,3,4,7,8,9-HpCDF	ND	0.9	0.3	0.01	0
	HpCDFs	ND	-	-	-	-
	OCDF	ND	1.8	0.5	0.0003	0
	Total PCDFs	1.0	-	-	-	0
Total PCDDs+PCDFs		2.7	-	-	-	0
Co-PCBs	3,3',4,4'-TeCB(#77)	(0.2)	0.6	0.2	0.0001	0
	3,4,4',5-TeCB(#81)	ND	0.6	0.2	0.0003	0
	3,3',4,4',5-PeCB(#126)	ND	0.12	0.04	0.1	0
	3,3',4,4',5,5'-HxCB(#169)	ND	0.30	0.09	0.03	0
	Total non-orthoCBs	0.20	-	-	-	0
	2,3,3',4,4'-PeCB(#105)	0.60	0.18	0.05	0.00003	0.000018
	2,3,4,4',5-PeCB(#114)	ND	0.5	0.2	0.00003	0
	2,3',4,4',5-PeCB(#118)	1.8	0.8	0.2	0.00003	0.000054
	2',3,4,4',5-PeCB(#123)	ND	0.6	0.2	0.00003	0
	2,3,3',4,4',5-HxCB(#156)	0.5	0.5	0.1	0.00003	0.000015
	2,3,3',4,4',5'-HxCB(#157)	ND	0.9	0.3	0.00003	0
	2,3',4,4',5,5'-HxCB(#167)	(0.2)	0.6	0.2	0.00003	0
	2,3,3',4,4',5,5'-HpCB(#189)	ND	0.5	0.2	0.00003	0
	Total mono-orthoCBs	3.1	-	-	-	0.000087
Total Co-PCBs		3.3	-	-	-	0.000087
Total PCDDs+PCDFs+Co-PCBs		6.0	-	-	-	0.000087

Note

① Used WHO-IPCS(2006) as TEF

② The numerical value with a parenthesis indicates the concentration of more than a minimum limit of detection and less than a determination limit.

③ "ND"in survey concentration describes under detection limit.

④ Values in parenthesis are below quantitation limit but greater or equal to detection limit.

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8. Results of Laboratory Tests on Samples from Sea Bottom Sediments and Seawater Sampling

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GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

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

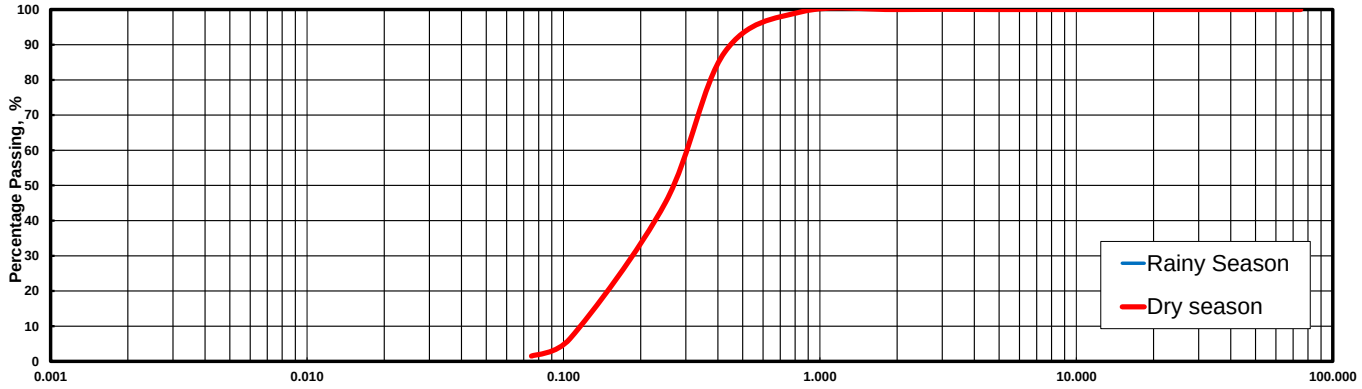
Sample No. : **SL-1-0** Rainy Season Depth : **0.00m** (- - - - - - - - - -) Specific Gravity :

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															
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-0** Dry Season Depth : **0.00m** (———————) Specific Gravity :

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	100.0	99.4	87.8	45.2	6.4	1.5
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	SL-1-0 R 0.00m		SL-1-0 D 0.00m		Sample No. Depth	SL-1-0 R 0.00m		SL-1-0 D 0.00m	
Larger than 4.75 mm		%	0.0	%	Max. Diameter		mm	2.00	mm
4.75 - 2.00 mm		%	0.0	%	Dia. at 60%		mm	0.1873	mm
2.00 - 0.425 mm		%	12.2	%	Dia. at 50%		mm	0.2654	mm
0.425 - 0.075 mm		%	86.3	%	Dia. at 30%		mm	0.1786	mm
0.075 - 0.005 mm		%	1.5	%	Dia. at 10%			0.1	
Smaller than 0.005 mm					Coeff. of Uniformity			2.62	
2000um Sieve Passing		%	100.0	%	Coeff. of Curvature			0.93	
425um Sieve Passing		%	99.4	%					
75um Sieve Passing		%	1.5	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **17.09.2014 11.11.2014** Tested By : **Sadamoto** Checked by :

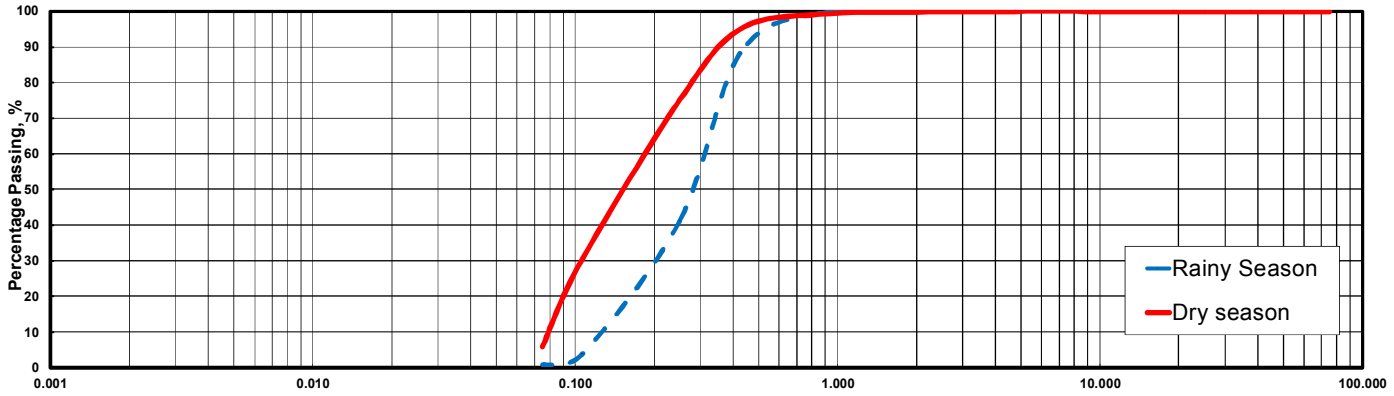
Sample No. : **SL-1-1** Rainy Season Depth : **1.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.5	88.2	41.2	3.7	0.9
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-1** Dry Season Depth : **1.00m** (——————) Specific Gravity :

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	99.2	95.0	75.1	30.3	5.9
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	SL-1-1 R 1.00m		SL-1-1 D 1.00m		Sample No. / Depth	SL-1-1 R 1.00m		SL-1-1 D 1.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	4.75	mm
4.75 - 2.00 mm	0.1	%	0.2	%	Dia. at 60%	0.309	mm	0.1873	mm
2.00 - 0.425 mm	11.7	%	4.8	%	Dia. at 50%	0.2761	mm	0.1546	mm
0.425 - 0.075 mm	87.3	%	89.1	%	Dia. at 30%	0.1935	mm	0.1055	mm
0.075 - 0.005 mm	0.9	%	5.9	%	Dia. at 10%	0.1		0.1	
Smaller than 0.005 mm					Coeff. of Uniformity	2.52		2.36	
2000um Sieve Passing	99.9	%	99.8	%	Coeff. of Curvature	0.99		0.75	
425um Sieve Passing	88.2	%	95.0	%					
75um Sieve Passing	0.9	%	5.9	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **17.09.2014 16.11.2014** Tested By : **Sadamoto** Checked by :

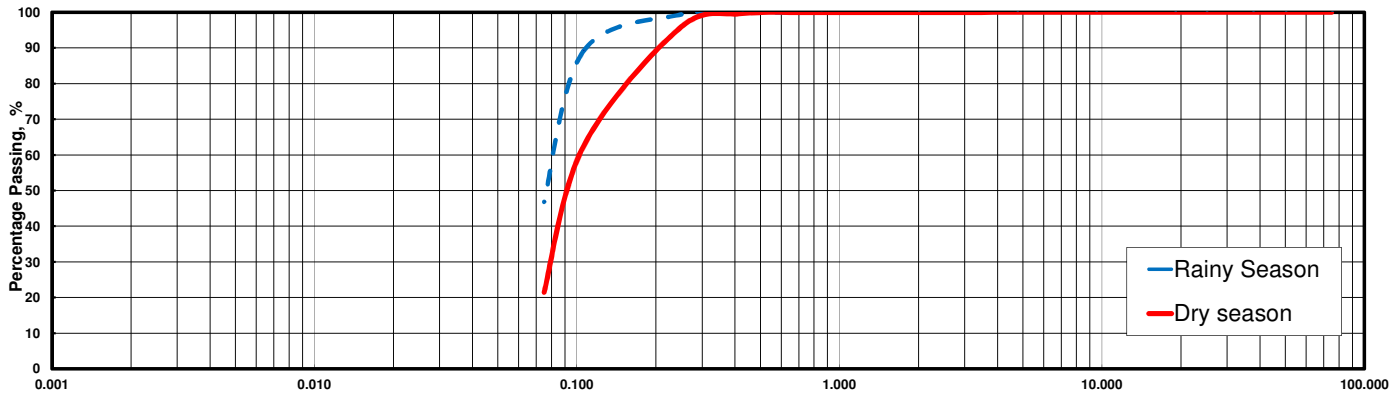
Sample No. : **SL-1-2** Rainy Season Depth : **2.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.4	89.2	46.8
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-2** Dry Season Depth : **2.00m** (———) Specific Gravity :

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	99.6	95.9	62.5	21.5
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	SL-1-2 R 2.00m		SL-1-2 D 2.00m		Sample No. Depth	SL-1-2 R 2.00m		SL-1-2 D 2.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	2.000	mm	4.75	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.084	mm	0.104	mm
2.00 - 0.425 mm	0.1	%	0.3	%	Dia. at 50%	0.077	mm	0.095	mm
0.425 - 0.075 mm	53.1	%	78.1	%	Dia. at 30%		mm	0.081	mm
0.075 - 0.005 mm	46.8	%	21.5	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.9	%	99.6	%					
75um Sieve Passing	46.8	%	21.5	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **17.09.2014 16.11.2014** Tested By : **Sadamoto** Checked by :

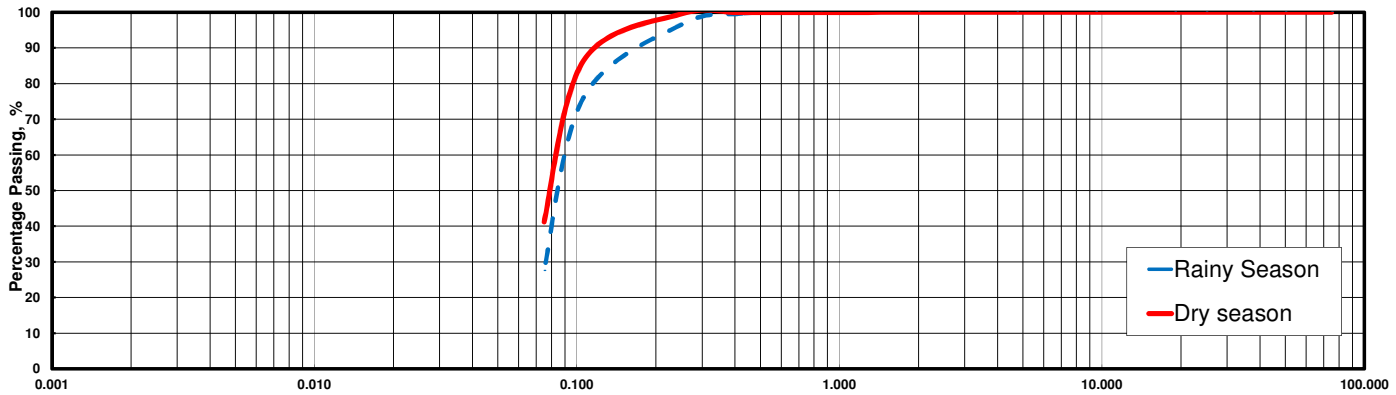
Sample No. : **SL-1-3** Rainy Season Depth : **3.00m** (- - - - - - - - - -) Specific Gravity :

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	99.7	96.6	76.1	27.6
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-3** Dry Season Depth : **3.00m** (———————) Specific Gravity :

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	99.9	99.6	86.4	41.2
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	SL-1-3 R 3.00m		SL-1-3 D 3.00m		Sample No. Depth	SL-1-3 R 3.00m		SL-1-3 D 3.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	2.00	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.094	mm	0.087	mm
2.00 - 0.425 mm	0.3	%	0.1	%	Dia. at 50%	0.088	mm	0.080	mm
0.425 - 0.075 mm	72.0	%	58.7	%	Dia. at 30%	0.0763	mm		mm
0.075 - 0.005 mm	27.6	%	41.2	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.7	%	99.9	%					
75um Sieve Passing	27.6	%	41.2	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **16.09.2014 16.11.2014** Tested By : **Sadamoto** Checked by :

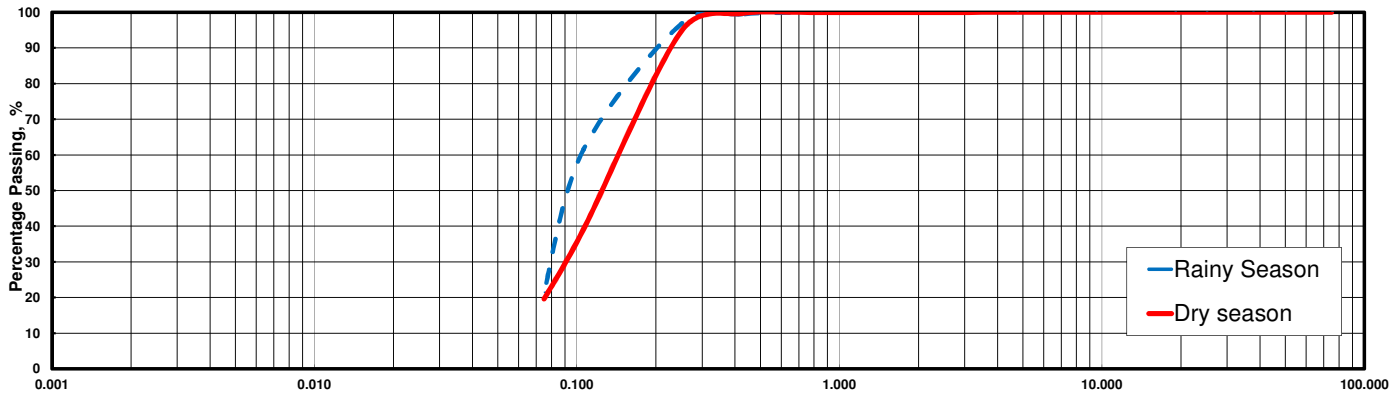
Sample No. : **SL-1-4** Rainy Season Depth : **4.00m** (- - - - - - - - - -) Specific Gravity :

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	99.5	96.8	61.6	21.5
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-4** Dry Season Depth : **4.00m** (———) Specific Gravity :

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	99.7	94.7	39.2	19.6
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	SL-1-4 R 4.00m		SL-1-4 D 4.00m		Sample No. Depth	SL-1-4 R 4.00m		SL-1-4 D 4.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	4.75	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.105	mm	0.146	mm
2.00 - 0.425 mm	0.5	%	0.3	%	Dia. at 50%	0.096	mm	0.125	mm
0.425 - 0.075 mm	78.0	%	80.1	%	Dia. at 30%	0.0807	mm	0.090	mm
0.075 - 0.005 mm	21.5	%	19.6	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.5	%	99.7	%					
75um Sieve Passing	21.5	%	19.6	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **20.09.2014 16.11.2014** Tested By : **Sadamoto** Checked by :

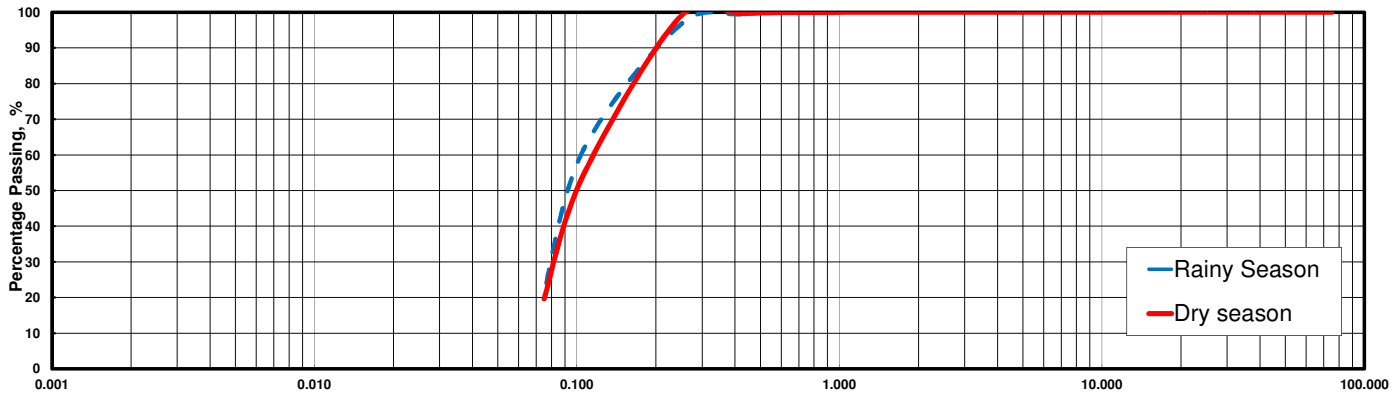
Sample No. : **SL-1-5** Rainy Season Depth : **5.00m** (- - - - - - - - - -) Specific Gravity :

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	99.5	96.8	61.6	21.5
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-5** Dry Season Depth : **5.00m** (———————) Specific Gravity :

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	99.7	99.1	54.5	19.6
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	SL-1-5 R 5.00m		SL-1-5 D 5.00m		Sample No. / Depth	SL-1-5 R 5.00m		SL-1-5 D 5.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	2.000	mm	2.00	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.118	mm	0.126	mm
2.00 - 0.425 mm	0.3	%	0.2	%	Dia. at 50%	0.101	mm	0.106	mm
0.425 - 0.075 mm	80.1	%	81.1	%	Dia. at 30%	0.0831	mm	0.0849	mm
0.075 - 0.005 mm	19.6	%	18.7	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.7	%	99.8	%					
75um Sieve Passing	19.6	%	18.7	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **20.09.2014 16.11.2014** Tested By : **Sadamoto** Checked by :

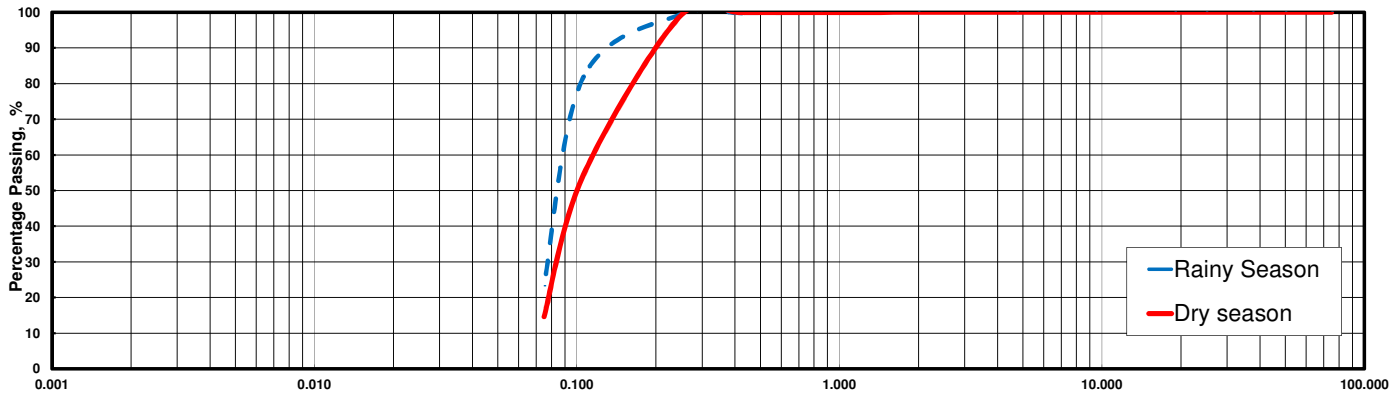
Sample No. : **SL-1-6** Rainy Season Depth : **6.00m** (- - - - - - - - - -) Specific Gravity :

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	99.8	99.4	81.9	23.3
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-6** Dry Season Depth : **6.00m** (———) Specific Gravity :

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	99.9	99.3	54.5	14.7
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	SL-1-6 R 6.00m		SL-1-6 D 6.00m		Sample No. Depth	SL-1-6 R 6.00m		SL-1-6 D 6.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	2.000	mm	2.00	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.093	mm	0.118	mm
2.00 - 0.425 mm	0.2	%	0.1	%	Dia. at 50%	0.088	mm	0.102	mm
0.425 - 0.075 mm	76.5	%	85.2	%	Dia. at 30%	0.0780	mm	0.0857	mm
0.075 - 0.005 mm	23.3	%	14.7	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.8	%	99.9	%					
75um Sieve Passing	23.3	%	14.7	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **20.09.2014 16.11.2014** Tested By : **Sadamoto** Checked by :

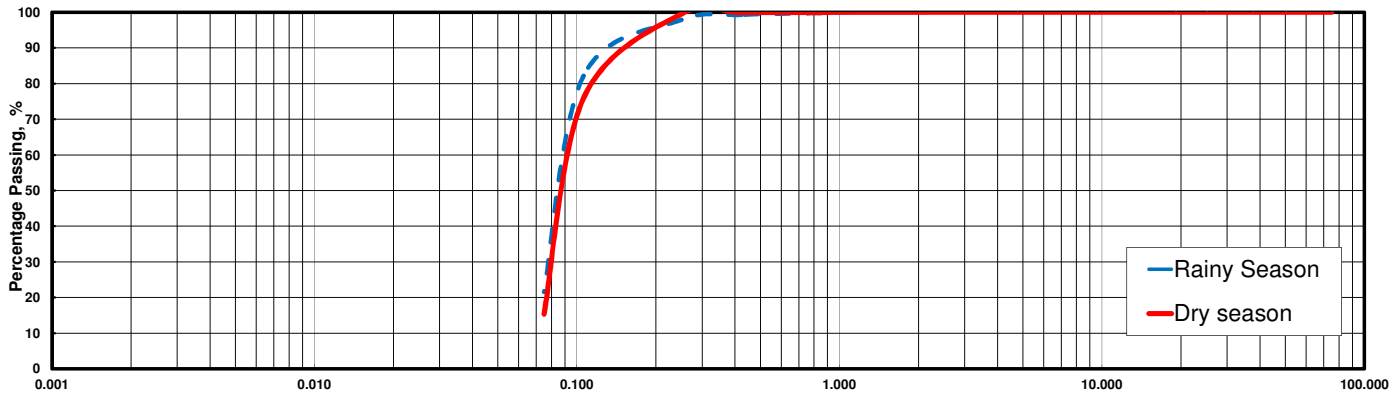
Sample No. : **SL-1-7** Rainy Season Depth : **7.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.8	99.3	97.9	82.2	21.5
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-7** Dry Season Depth : **7.00m** (———————) Specific Gravity :

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	99.9	99.5	75.9	15.3
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	SL-1-7 R 7.00m		SL-1-7D 7.00m		Sample No. Depth	SL-1-7 R 7.00m		SL-1-7D 7.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	2.00	mm
4.75 - 2.00 mm	0.1	%	0.0	%	Dia. at 60%	0.093	mm	0.097	mm
2.00 - 0.425 mm	0.7	%	0.1	%	Dia. at 50%	0.088	mm	0.091	mm
0.425 - 0.075 mm	77.8	%	84.6	%	Dia. at 30%	0.0787	mm	0.0816	mm
0.075 - 0.005 mm	21.5	%	15.3	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	99.9	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.3	%	99.9	%					
75um Sieve Passing	21.5	%	15.3	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **20.09.2014 16.11.2014** Tested By : **Sadamoto** Checked by :

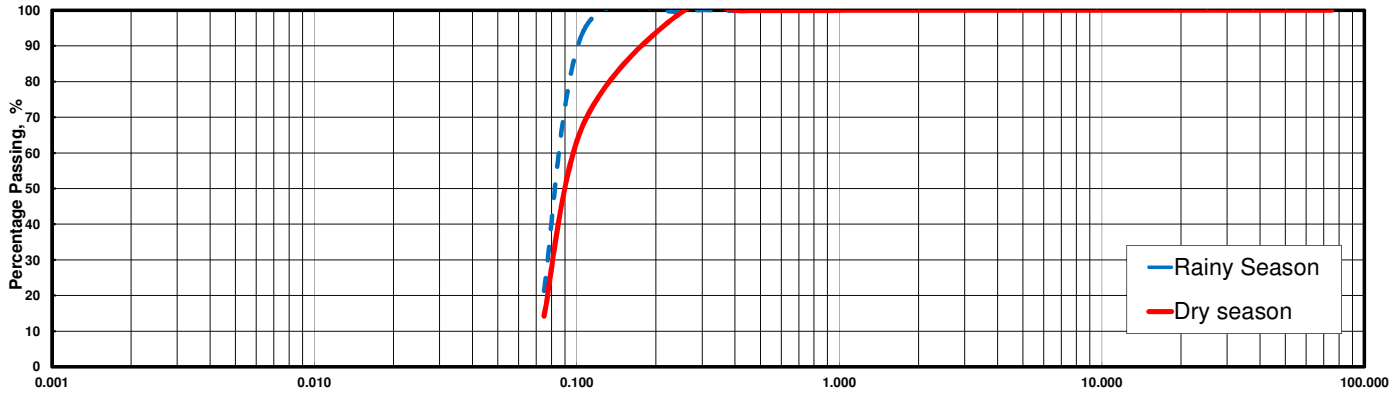
Sample No. : **SL-1-8** Rainy Season Depth : **8.00m** (- - - - - - - - - -) Specific Gravity :

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	99.8	99.6	94.3	21.3
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-8** Dry Season Depth : **8.00m** (———————) Specific Gravity :

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	99.9	99.4	68.2	14.2
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	SL-1-8 R 8.00m		SL-1-8D 8.00m		Sample No. / Depth	SL-1-8 R 8.00m		SL-1-8D 8.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	2.00	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.090	mm	0.101	mm
2.00 - 0.425 mm	0.2	%	0.1	%	Dia. at 50%	0.086	mm	0.094	mm
0.425 - 0.075 mm	78.6	%	85.7	%	Dia. at 30%	0.0782	mm	0.0830	mm
0.075 - 0.005 mm	21.3	%	14.2	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.8	%	99.9	%					
75um Sieve Passing	21.3	%	14.2	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **20.09.2014 16.11.2014** Tested By : **Sadamoto** Checked by :

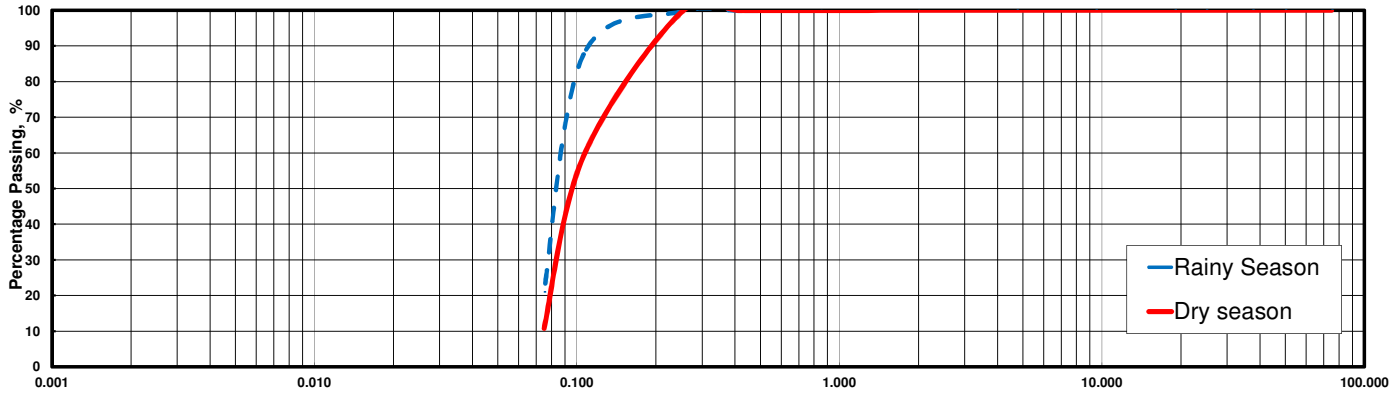
Sample No. : **SL-1-9** Rainy Season Depth : **9.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.9	99.7	87.6	21.0
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-9** Dry Season Depth : **9.00m** (———————) Specific Gravity :

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	99.9	99.5	59.1	10.8
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	SL-1-9 R 9.00m		SL-1-9D 9.00m		Sample No. Depth	SL-1-9 R 9.00m		SL-1-9D 9.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	2.00	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.092	mm	0.108	mm
2.00 - 0.425 mm	0.1	%	0.1	%	Dia. at 50%	0.087	mm	0.099	mm
0.425 - 0.075 mm	78.9	%	89.2	%	Dia. at 30%	0.0786	mm	0.0861	mm
0.075 - 0.005 mm	21.0	%	10.8	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.9	%	99.9	%					
75um Sieve Passing	21.0	%	10.8	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **20.09.2014 16.11.2014** Tested By : **Sadamoto** Checked by :

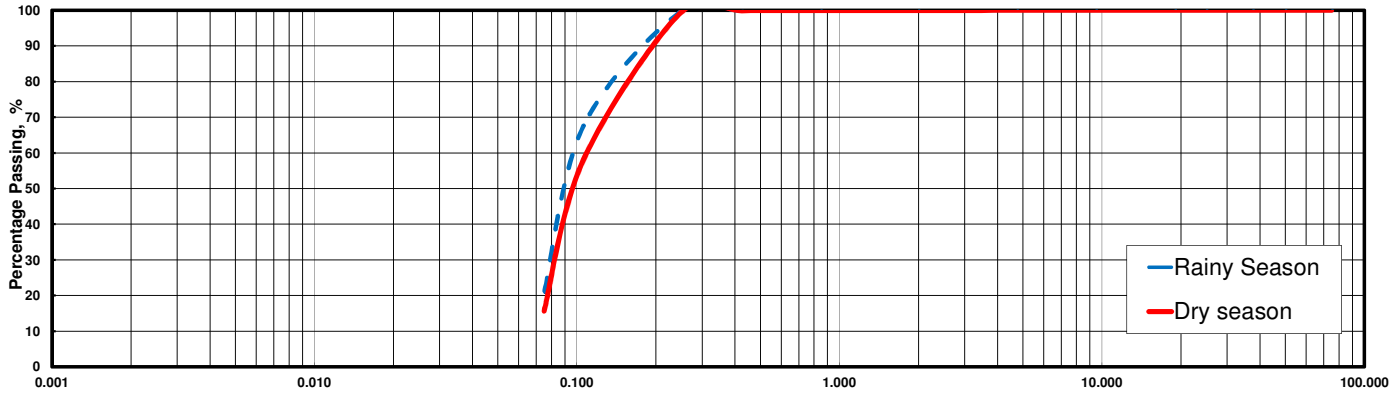
Sample No. : **SL-1-10** Rainy Season Depth : **10.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.8	67.6	20.7
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-10** Dry Season Depth : **10.00m** (———————) Specific Gravity :

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	99.9	99.5	58.1	15.7
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	SL-1-10 R 10.00m		SL-1-10D 10.00m		Sample No. Depth	SL-1-10 R 10.00m		SL-1-10D 10.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	2.000	mm	4.75	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.100	mm	0.110	mm
2.00 - 0.425 mm	0.1	%	0.1	%	Dia. at 50%	0.093	mm	0.099	mm
0.425 - 0.075 mm	79.3	%	84.2	%	Dia. at 30%	0.0803	mm	0.0843	mm
0.075 - 0.005 mm	20.7	%	15.7	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.9	%	99.9	%					
75um Sieve Passing	20.7	%	15.7	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **20.09.2014 16.11.2014** Tested By : **Sadamoto** Checked by :

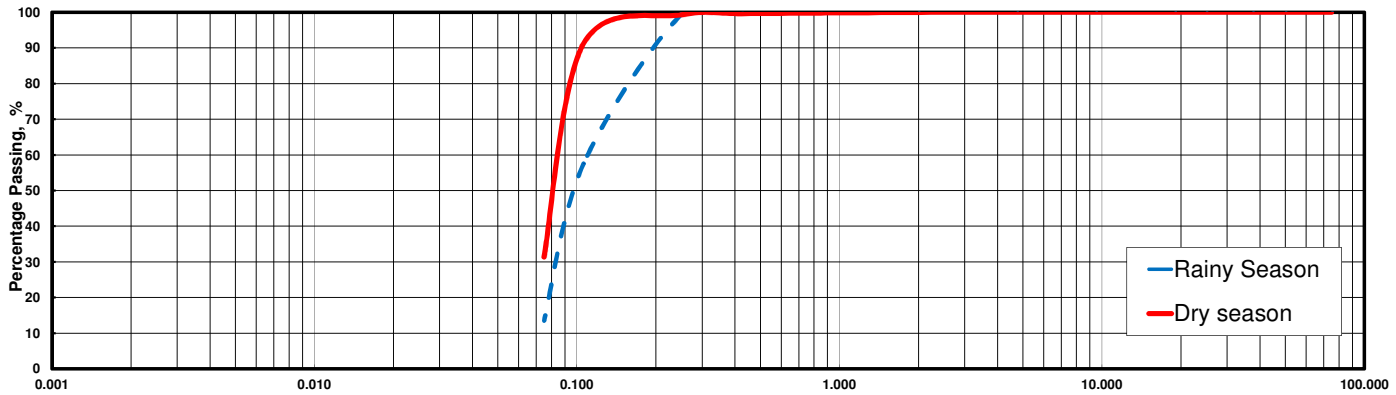
Sample No. : **SL-1-11** Rainy Season Depth : **11.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.4	57.5	13.5
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-11** Dry Season Depth : **11.00m** (———————) Specific Gravity :

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	99.6	99.3	91.2	31.3
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	SL-1-11 R 11.00m		SL-1-11D 11.00m		Sample No. Depth	SL-1-11 R 11.00m		SL-1-11D 11.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	4.75	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.111	mm	0.089	mm
2.00 - 0.425 mm	0.1	%	0.4	%	Dia. at 50%	0.100	mm	0.084	mm
0.425 - 0.075 mm	86.4	%	68.3	%	Dia. at 30%	0.0854	mm		mm
0.075 - 0.005 mm	13.5	%	31.3	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.9	%	99.6	%					
75um Sieve Passing	13.5	%	31.3	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **20.09.2014 16.11.2014** Tested By : **Sadamoto** Checked by :

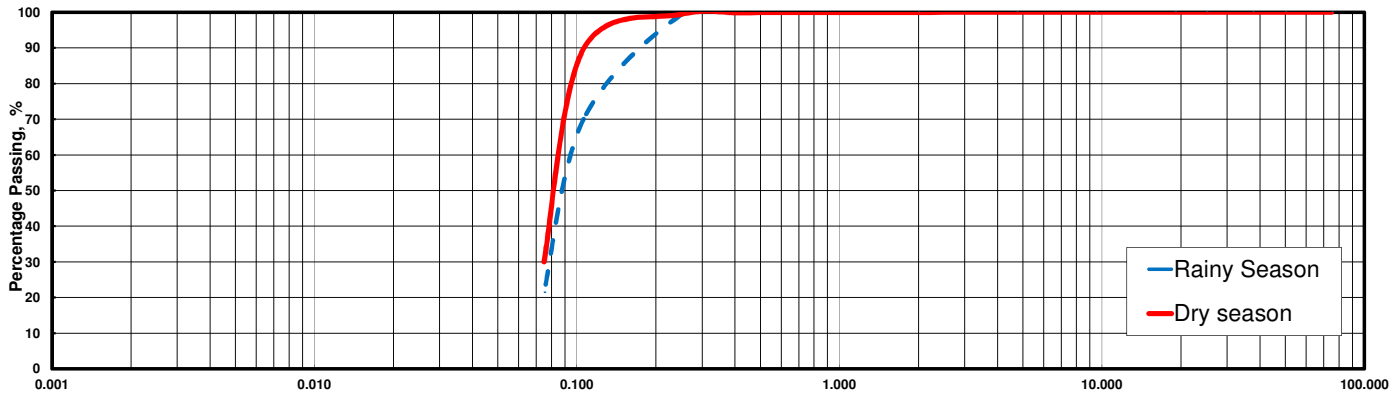
Sample No. : **SL-1-12** Rainy Season Depth : **12.00m** (- - - - - - - - -) Specific Gravity :

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	99.9	99.4	70.0	21.5
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-12** Dry Season Depth : **12.00m** (———) Specific Gravity :

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	99.9	99.5	89.8	30.0
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	SL-1-12 R 12.00m		SL-1-12D 12.00m		Sample No. Depth	SL-1-12 R 12.00m		SL-1-12D 12.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	2.000	mm	4.75	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.099	mm	0.089	mm
2.00 - 0.425 mm	0.1	%	0.1	%	Dia. at 50%	0.092	mm	0.084	mm
0.425 - 0.075 mm	78.4	%	69.9	%	Dia. at 30%	0.080	mm		mm
0.075 - 0.005 mm	21.5	%	30.0	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.9	%	99.9	%					
75um Sieve Passing	21.5	%	30.0	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **20.09.2014 16.11.2014** Tested By : **Sadamoto** Checked by :

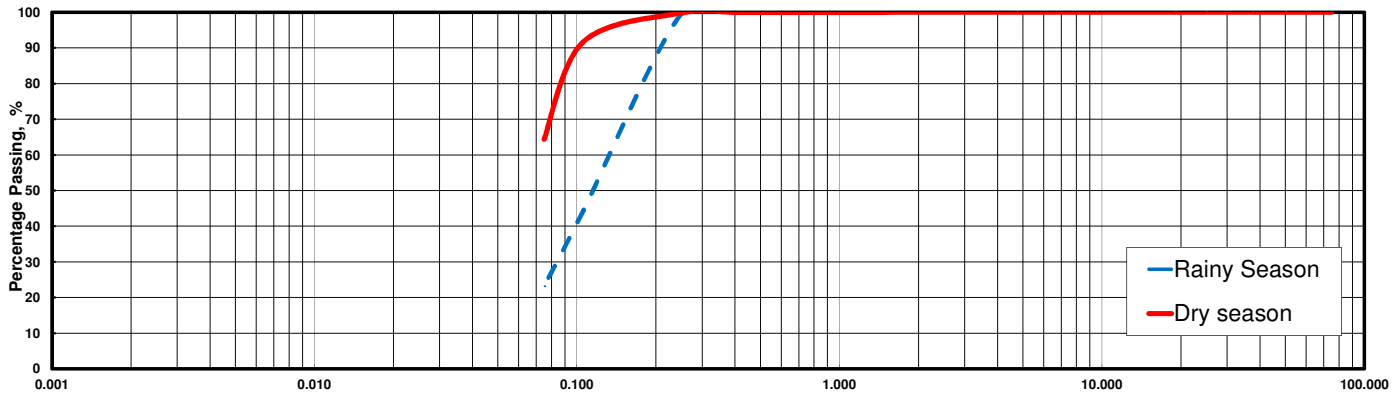
Sample No. : **SL-1-13** Rainy Season Depth : **13.00m** (- - - - - - - - -) Specific Gravity :

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	99.9	99.9	99.6	44.5	23.2
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-13** Dry Season Depth : **13.00m** (———) Specific Gravity :

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	99.9	99.8	91.8	64.4
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	SL-1-13 R 13.00m		SL-1-13D 13.00m		Sample No. Depth	SL-1-13 R 13.00m		SL-1-13D 13.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	2.00	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.135	mm		mm
2.00 - 0.425 mm	0.1	%	0.1	%	Dia. at 50%	0.115	mm		mm
0.425 - 0.075 mm	76.7	%	35.5	%	Dia. at 30%	0.084	mm		mm
0.075 - 0.005 mm	23.2	%	64.4	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.9	%	99.9	%					
75um Sieve Passing	23.2	%	64.4	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **23.09.2014 16.11.2014** Tested By : **Sadamoto** Checked by :

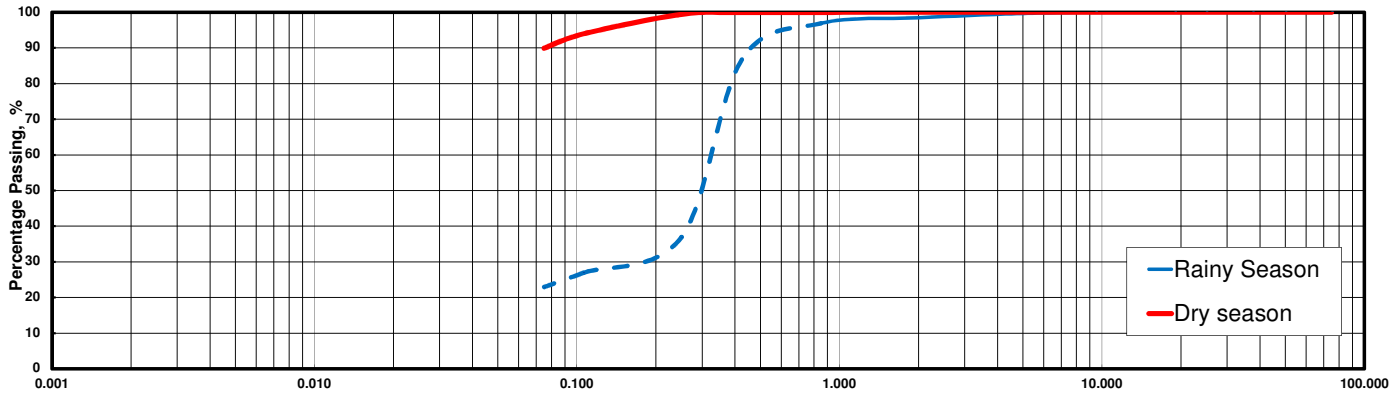
Sample No. : **SL-1-end** Rainy Season Depth : **12.63m** (- - - - - - - - - -) Specific Gravity :

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	99.6	98.4	96.9	86.7	36.9	26.9	22.9
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-1-end** Dry Season Depth : **12.63m** (———————) Specific Gravity :

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	99.9	99.4	94.0	89.9
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	SL-1-end R 12.63m		SL-1-end D 12.63m		Sample No. Depth	SL-1-end R 12.63m		SL-1-end D 12.63m	
Larger than 4.75 mm	0.4	%	0.0	%	Max. Diameter	9.500	mm	2.00	mm
4.75 - 2.00 mm	1.2	%	0.0	%	Dia. at 60%	0.320	mm		mm
2.00 - 0.425 mm	11.7	%	0.1	%	Dia. at 50%	0.287	mm		mm
0.425 - 0.075 mm	63.8	%	10.0	%	Dia. at 30%	0.138	mm		mm
0.075 - 0.005 mm	22.9	%	89.9	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	98.4	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	86.7	%	99.9	%					
75um Sieve Passing	22.9	%	89.9	%					

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GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

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

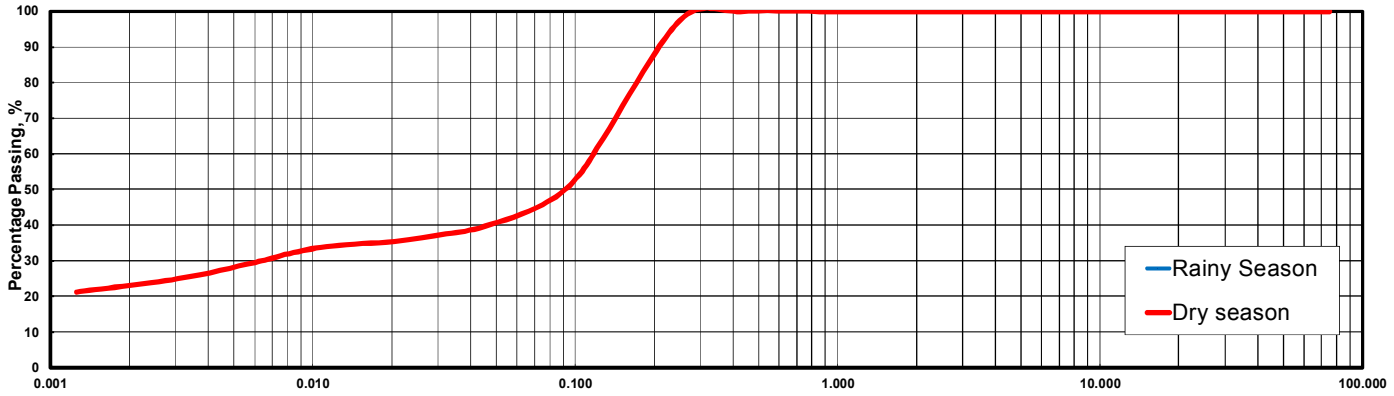
Sample No. : **SL-2-0** Rainy Season Depth : **0.00m** (- - - - - - - - - -) Specific Gravity :

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															
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-2-0** Dry Season Depth : **0.00m** (———————) Specific Gravity :

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	100.0	100.0	100.0	97.4	55.1	45.8
Hydro.	Dia., mm	0.045	0.032	0.020	0.012	0.0084	0.0060	0.0030	0.0013							
	% Passing	39.7	37.5	35.5	34.2	32.3	29.6	24.9	21.2							

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	SL-2-0 R 0.00m		SL-2-0 D 0.00m		Sample No. Depth	SL-2-0 R 0.00m		SL-2-0 D 0.00m	
Larger than 4.75 mm		%	0.0	%	Max. Diameter		mm	0.43	mm
4.75 - 2.00 mm		%	0.0	%	Dia. at 60%		mm	0.1170	mm
2.00 - 0.425 mm		%	0.0	%	Dia. at 50%		mm	0.0877	mm
0.425 - 0.075 mm		%	54.2	%	Dia. at 30%		mm	0.0064	mm
0.075 - 0.005 mm		%	17.8	%	Dia. at 10%			-	
Smaller than 0.005 mm		%	28.0	%	Coeff. of Uniformity			-	
2000um Sieve Passing		%	100.0	%	Coeff. of Curvature			-	
425um Sieve Passing		%	100.0	%					
75um Sieve Passing		%	45.8	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **23.09.2014 11.11.2014** Tested By : **Sadamoto** Checked by :

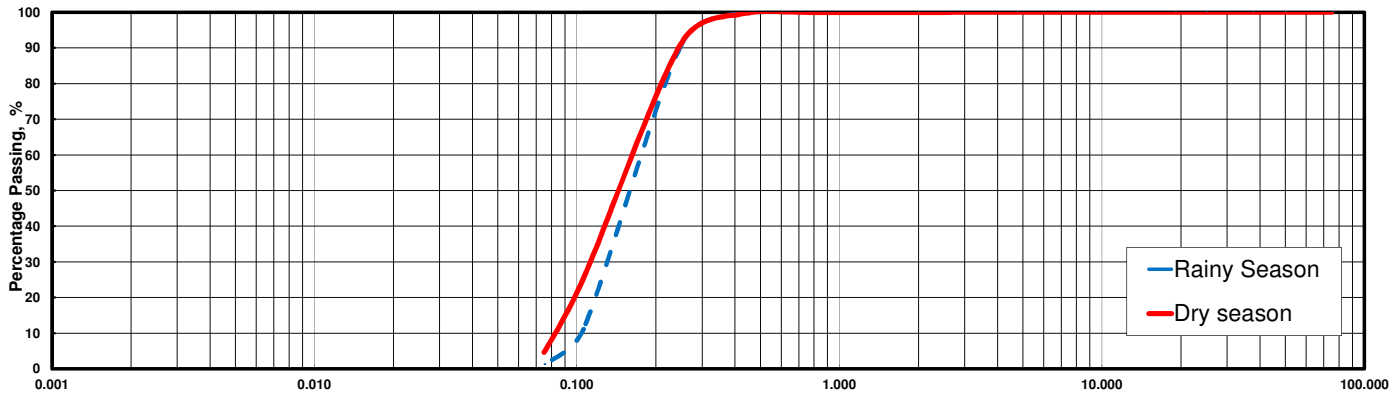
Sample No. : **SL-2-1** Rainy Season Depth : **1.00m** (- - - - - - - - -) Specific Gravity :

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	99.8	91.0	11.1	1.4
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-2-1** Dry Season Depth : **1.00m** (———) Specific Gravity :

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	99.5	91.4	25.4	4.6
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	SL-2-1 R 1.00m		SL-2-1 D 1.00m		Sample No. Depth	SL-2-1 R 1.00m		SL-2-1 D 1.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	4.75	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.179	mm	0.166	mm
2.00 - 0.425 mm	0.2	%	0.4	%	Dia. at 50%	0.161	mm	0.146	mm
0.425 - 0.075 mm	98.4	%	94.9	%	Dia. at 30%	0.130	mm	0.1125	mm
0.075 - 0.005 mm	1.4	%	4.6	%	Dia. at 10%	0.1		0.1	
Smaller than 0.005 mm					Coeff. of Uniformity	1.76		2.03	
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature	0.92		0.93	
425um Sieve Passing	99.8	%	99.5	%					
75um Sieve Passing	1.4	%	4.6	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : 23.09.2014 17.11.2014 Tested By : **Sadamoto** Checked by :

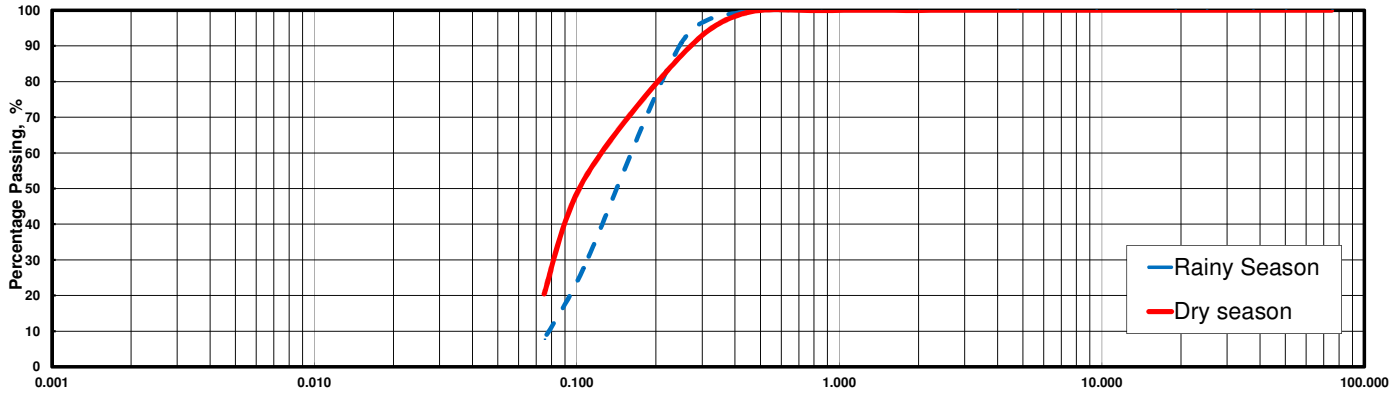
Sample No. : **SL-2-3** Rainy Season Depth : **3.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.5	90.8	27.7	7.8
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-2-3** Dry Season Depth : **3.00m** (———————) Specific Gravity :

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	99.0	87.3	52.3	20.5
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	SL-2-3 R 3.00m		SL-2-3 D 3.00m		Sample No. Depth	SL-2-3 R 3.00m		SL-2-3 D 3.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	4.75	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.164	mm	0.128	mm
2.00 - 0.425 mm	0.5	%	1.0	%	Dia. at 50%	0.144	mm	0.103	mm
0.425 - 0.075 mm	91.7	%	78.5	%	Dia. at 30%	0.109	mm	0.0832	mm
0.075 - 0.005 mm	7.8	%	20.5	%	Dia. at 10%	0.1			
Smaller than 0.005 mm					Coeff. of Uniformity	2.11			
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature	0.93			
425um Sieve Passing	99.5	%	99.0	%					
75um Sieve Passing	7.8	%	20.5	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **23.09.2014 17.11.2014** Tested By : **Sadamoto** Checked by :

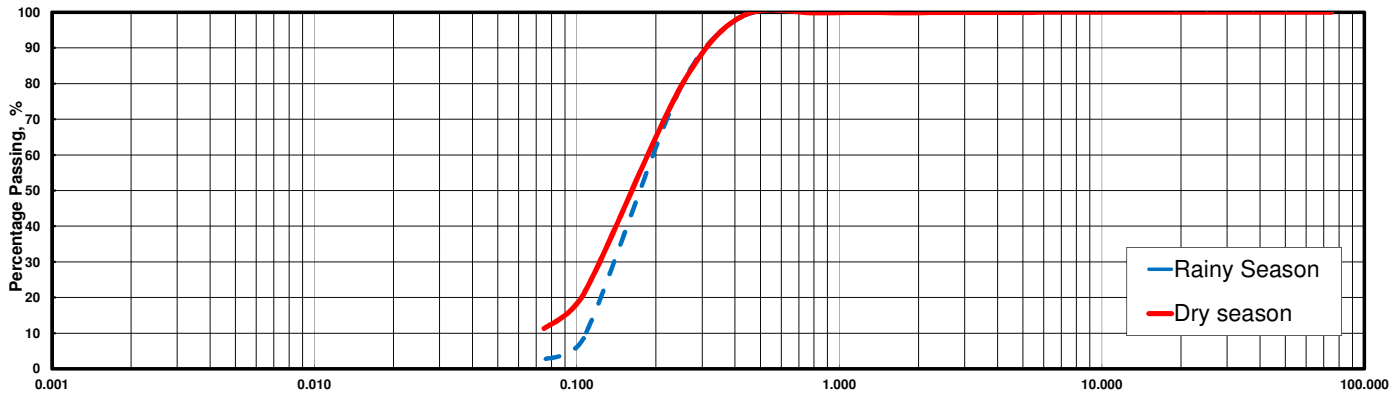
Sample No. : **SL-2-5** Rainy Season Depth : **5.00m** (- - - - - - - - -) Specific Gravity :

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	99.9	99.9	99.8	98.7	79.4	8.6	2.7
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-2-5** Dry Season Depth : **5.00m** (———) Specific Gravity :

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	99.8	98.9	79.4	21.0	11.3
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	SL-2-5 R 5.00m		SL-2-5 D 5.00m		Sample No. Depth	SL-2-5 R 5.00m		SL-2-5 D 5.00m	
Larger than 4.75 mm	0.1	%	0.0	%	Max. Diameter	9.500	mm	9.50	mm
4.75 - 2.00 mm	0.0	%	0.1	%	Dia. at 60%	0.198	mm	0.188	mm
2.00 - 0.425 mm	1.2	%	1.0	%	Dia. at 50%	0.175	mm	0.162	mm
0.425 - 0.075 mm	96.1	%	87.6	%	Dia. at 30%	0.137	mm	0.121	mm
0.075 - 0.005 mm	2.7	%	11.3	%	Dia. at 10%	0.1			
Smaller than 0.005 mm					Coeff. of Uniformity	1.83			
2000um Sieve Passing	99.9	%	99.9	%	Coeff. of Curvature	0.89			
425um Sieve Passing	98.7	%	98.9	%					
75um Sieve Passing	2.7	%	11.3	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **23.09.2014 17.11.2014** Tested By : **Sadamoto** Checked by :

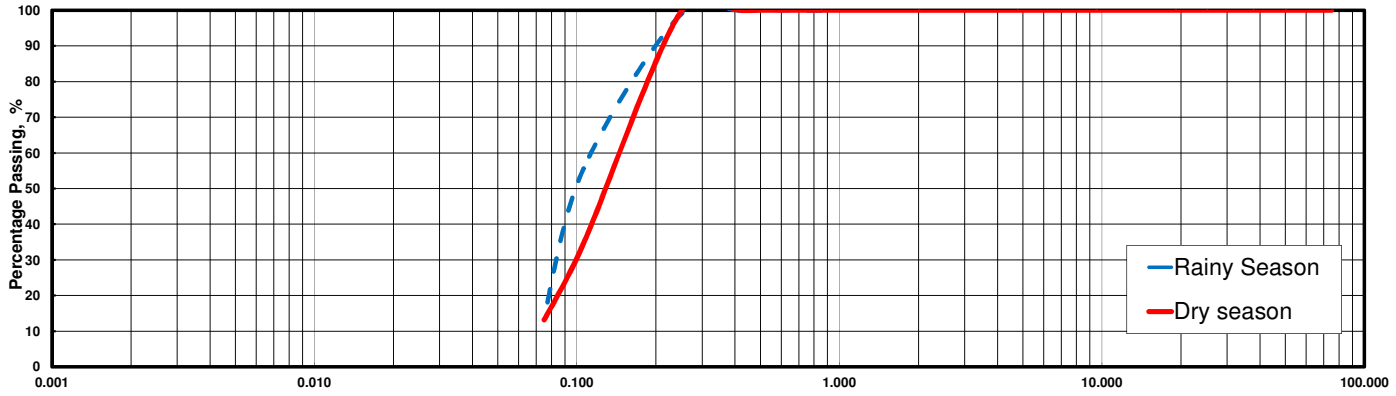
Sample No. : **SL-2-7** Rainy Season Depth : **7.00m** (- - - - - - - - -) Specific Gravity :

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	99.9	99.0	55.6	13.9
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-2-7** Dry Season Depth : **7.00m** (———) Specific Gravity :

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	100.0	99.8	34.6	13.2
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	SL-2-7 R 7.00m		SL-2-7D 7.00m		Sample No. Depth	SL-2-7 R 7.00m		SL-2-7D 7.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	2.000	mm	0.85	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.116	mm	0.148	mm
2.00 - 0.425 mm	0.1	%	0.0	%	Dia. at 50%	0.101	mm	0.130	mm
0.425 - 0.075 mm	86.0	%	86.8	%	Dia. at 30%	0.086	mm	0.098	mm
0.075 - 0.005 mm	13.9	%	13.2	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.9	%	100.0	%					
75um Sieve Passing	13.9	%	13.2	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **23.09.2014 18.11.2014** Tested By : **Sadamoto** Checked by :

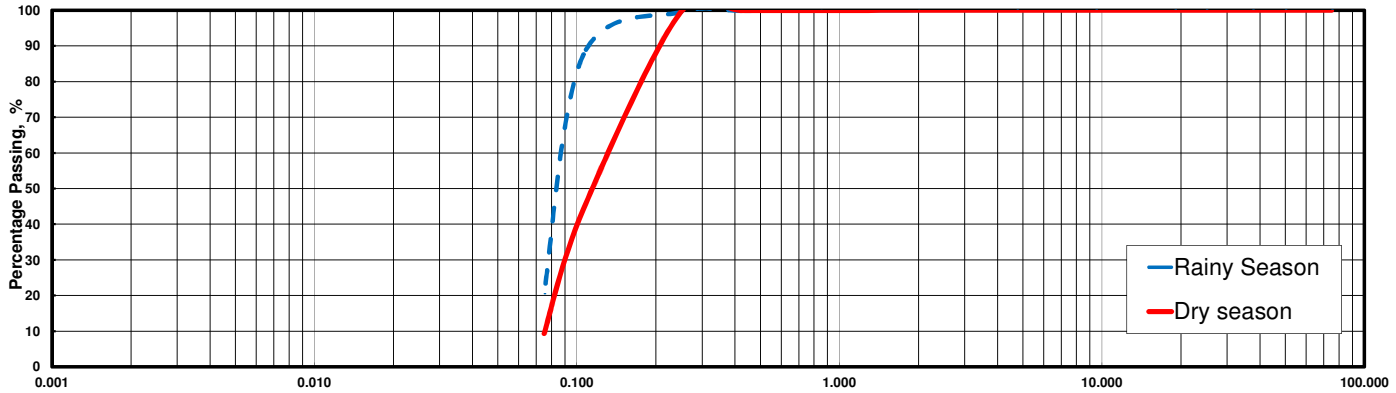
Sample No. : **SL-2-9** Rainy Season Depth : **9.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.9	99.9	99.6	87.6	20.5
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-2-9** Dry Season Depth : **9.00m** (———) Specific Gravity :

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	99.9	99.7	44.3	9.4
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	GRAVEL	
		SAND									

Sample No. Depth	SL-2-9 R 9.00m		SL-2-9D 9.00m		Sample No. Depth	SL-2-9 R 9.00m		SL-2-9D 9.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	2.00	mm
4.75 - 2.00 mm	0.1	%	0.0	%	Dia. at 60%	0.092	mm	0.135	mm
2.00 - 0.425 mm	0.1	%	0.1	%	Dia. at 50%	0.087	mm	0.116	mm
0.425 - 0.075 mm	79.4	%	90.6	%	Dia. at 30%	0.079	mm	0.092	mm
0.075 - 0.005 mm	20.5	%	9.4	%	Dia. at 10%			0.1	
Smaller than 0.005 mm					Coeff. of Uniformity			1.79	
2000um Sieve Passing	99.9	%	100.0	%	Coeff. of Curvature			0.83	
425um Sieve Passing	99.9	%	99.9	%					
75um Sieve Passing	20.5	%	9.4	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : 23.09.2014 17.11.2014 Tested By : **Sadamoto** Checked by :

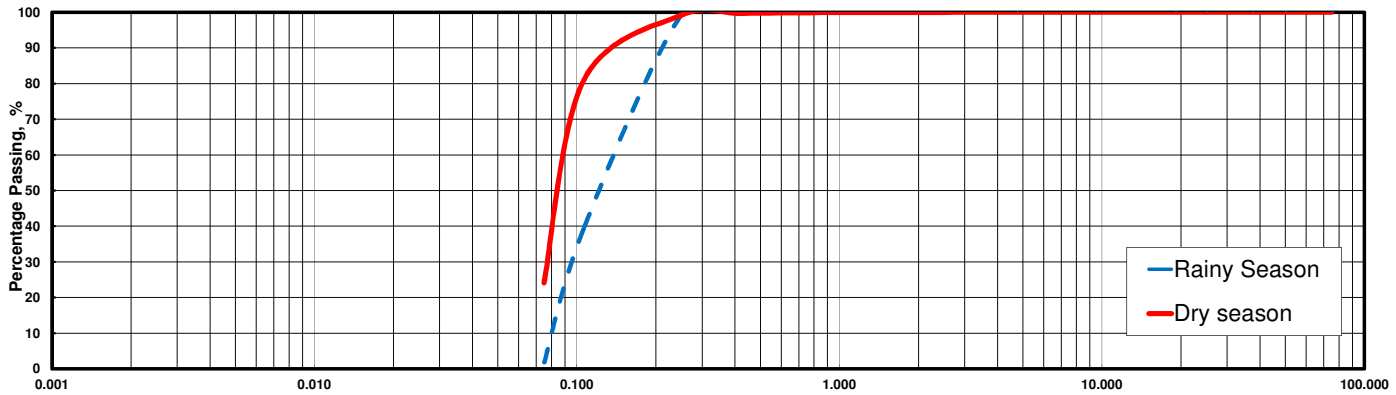
Sample No. : **SL-2-11** Rainy Season Depth : **11.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.8	99.2	39.2	1.7
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-2-11** Dry Season Depth : **11.00m** (———————) Specific Gravity :

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	99.7	99.2	80.9	24.1
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	SL-2-11 R 11.00m		SL-2-11D 11.00m		Sample No. Depth	SL-2-11 R 11.00m		SL-2-11D 11.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	4.75	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.143	mm	0.093	mm
2.00 - 0.425 mm	0.2	%	0.3	%	Dia. at 50%	0.124	mm	0.088	mm
0.425 - 0.075 mm	98.1	%	75.6	%	Dia. at 30%	0.097	mm	0.078	mm
0.075 - 0.005 mm	1.7	%	24.1	%	Dia. at 10%	0.1			
Smaller than 0.005 mm					Coeff. of Uniformity	1.76			
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature	0.82			
425um Sieve Passing	99.8	%	99.7	%					
75um Sieve Passing	1.7	%	24.1	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : 25.09.2014 17.11.2014 Tested By : **Sadamoto** Checked by :

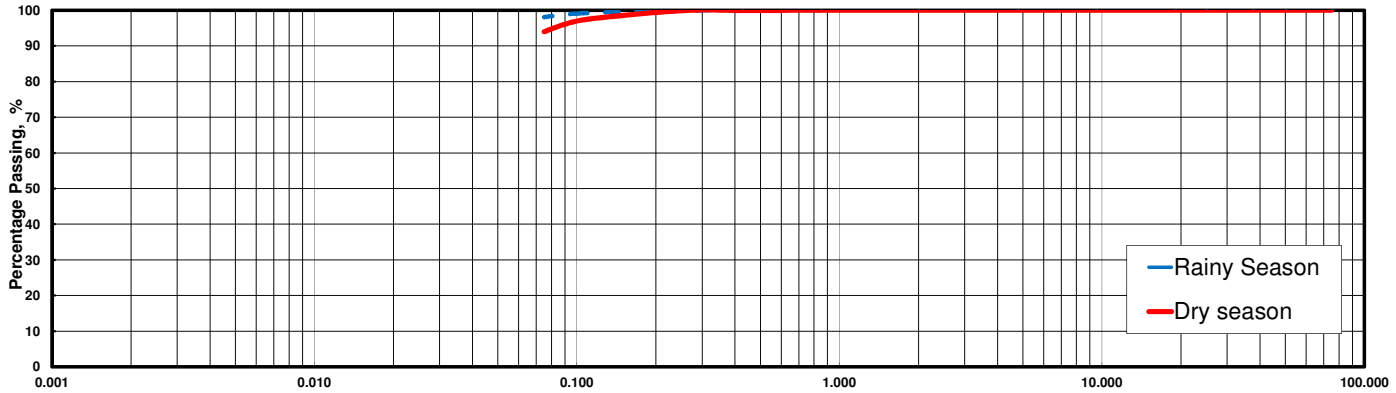
Sample No. : **SL-2-end** Rainy Season Depth : **12.38m** (- - - - - - - - - -) Specific Gravity :

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	98.1
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-2-end** Dry Season Depth : **12.38m** (———) Specific Gravity :

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	100.0	99.9	97.3	94.0
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	SL-2-end R 12.38m		SL-2-end D 12.38m		Sample No. Depth	SL-2-end R 12.38m		SL-2-end D 12.38m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	0.850	mm	0.85	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%		mm		mm
2.00 - 0.425 mm	0.0	%	0.0	%	Dia. at 50%		mm		mm
0.425 - 0.075 mm	1.9	%	6.0	%	Dia. at 30%		mm		mm
0.075 - 0.005 mm	98.1	%	94.0	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	100.0	%	100.0	%					
75um Sieve Passing	98.1	%	94.0	%					

GRAIN SIZE DISTRIBUTION

Project :

Location of Project : Project No. :

Tested Method : Date of Testing : Tested By : Checked by :

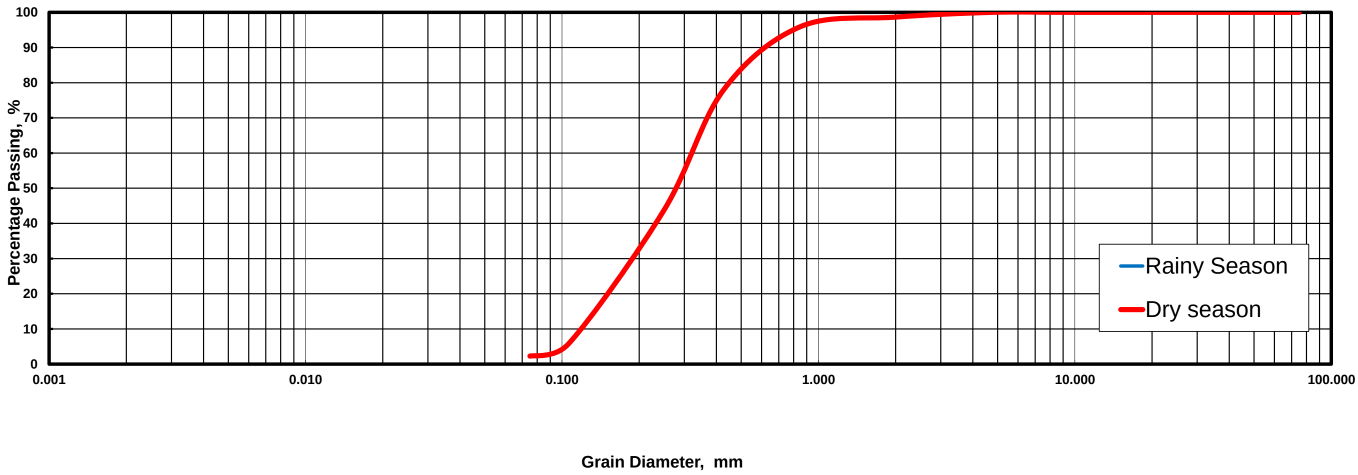
Sample No. : **SL-3-0** Rainy Season Depth : **0.00m** ( ) Specific Gravity :

	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															
	Dia., mm															
	% Passing															

Sample No. : **SL-3-0** Dry Season Depth : **0.00m** ( ) Specific Gravity :

	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	98.6	95.9	77.8	43.8	5.7	2.3
	Dia., mm															
	% Passing															

Grain Size Distribution Curves



2.00 19.0 75.0

FINE

SILT

Sample No. Depth			Sample No. Depth		
	%	0.0 %		mm	4.75 mm
	%	1.4 %		mm	0.3220 mm
	%	20.9 %		mm	0.2755 mm
	%	75.5 %		mm	0.1832 mm
	%		Dia. at 10%		0.1
	%		Coeff. of Uniformity		2.76
2000um Sieve Passing	%	100.0 %	Coeff. of Curvature		

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **23.09.2014 11.11.2014** Tested By : **Sadamoto** Checked by :

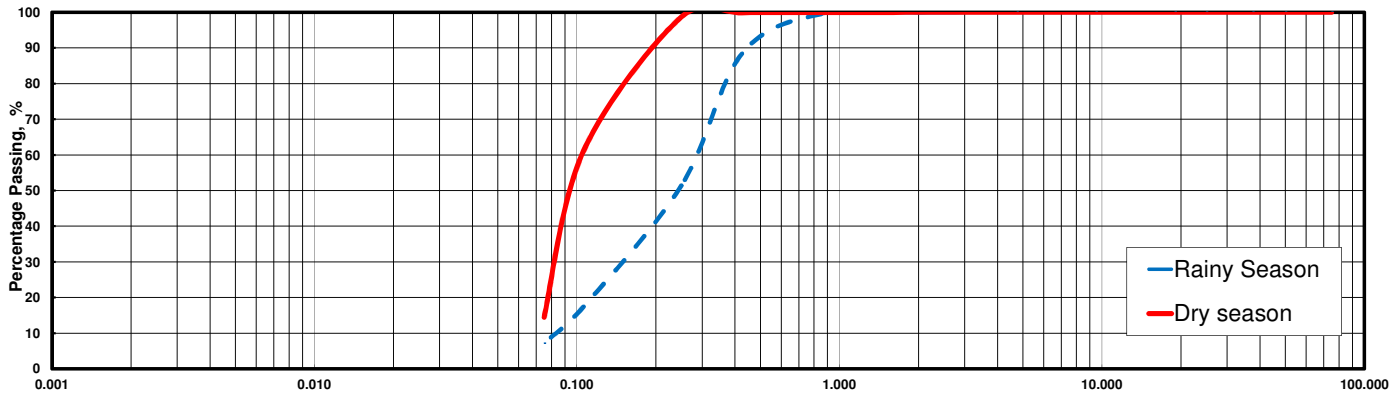
Sample No. : **SL-3-1** Rainy Season Depth : **1.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.5	88.4	51.4	17.4	7.3
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-3-1** Dry Season Depth : **1.00m** (———————) Specific Gravity :

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	99.9	98.7	61.2	14.5
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	SL-3-1 R 1.00m		SL-3-1 D 1.00m		Sample No. Depth	SL-3-1 R 1.00m		SL-3-1 D 1.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	2.00	mm
4.75 - 2.00 mm	0.1	%	0.0	%	Dia. at 60%	0.283	mm	0.105	mm
2.00 - 0.425 mm	11.5	%	0.1	%	Dia. at 50%	0.241	mm	0.098	mm
0.425 - 0.075 mm	81.1	%	85.4	%	Dia. at 30%	0.146	mm	0.084	mm
0.075 - 0.005 mm	7.3	%	14.5	%	Dia. at 10%	0.1			
Smaller than 0.005 mm					Coeff. of Uniformity	3.44			
2000um Sieve Passing	99.9	%	100.0	%	Coeff. of Curvature	0.91			
425um Sieve Passing	88.4	%	99.9	%					
75um Sieve Passing	7.3	%	14.5	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **24.09.2014 18.11.2014** Tested By : **Sadamoto** Checked by :

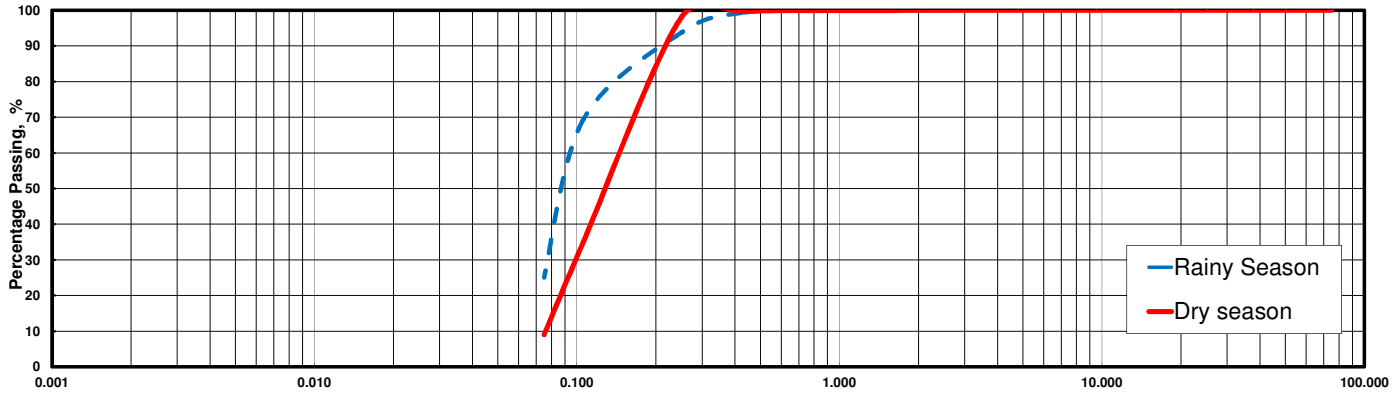
Sample No. : **SL-3-3** Rainy Season Depth : **3.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.8	99.3	93.7	69.5	25.0
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-3-3** Dry Season Depth : **3.00m** (———————) Specific Gravity :

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	99.7	98.0	35.1	9.0
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	SL-3-3 R 3.00m		SL-3-3D 3.00m		Sample No. Depth	SL-3-3 R 3.00m		SL-3-3D 3.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	2.00	mm
4.75 - 2.00 mm	0.1	%	0.0	%	Dia. at 60%	0.098	mm	0.149	mm
2.00 - 0.425 mm	0.6	%	0.3	%	Dia. at 50%	0.091	mm	0.130	mm
0.425 - 0.075 mm	74.3	%	90.6	%	Dia. at 30%	0.078	mm	0.099	mm
0.075 - 0.005 mm	25.0	%	9.0	%	Dia. at 10%			0.076	
Smaller than 0.005 mm					Coeff. of Uniformity			1.959	
2000um Sieve Passing	99.9	%	100.0	%	Coeff. of Curvature			0.867	
425um Sieve Passing	99.3	%	99.7	%					
75um Sieve Passing	25.0	%	9.0	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **24.09.2014 18.11.2014** Tested By : **Sadamoto** Checked by :

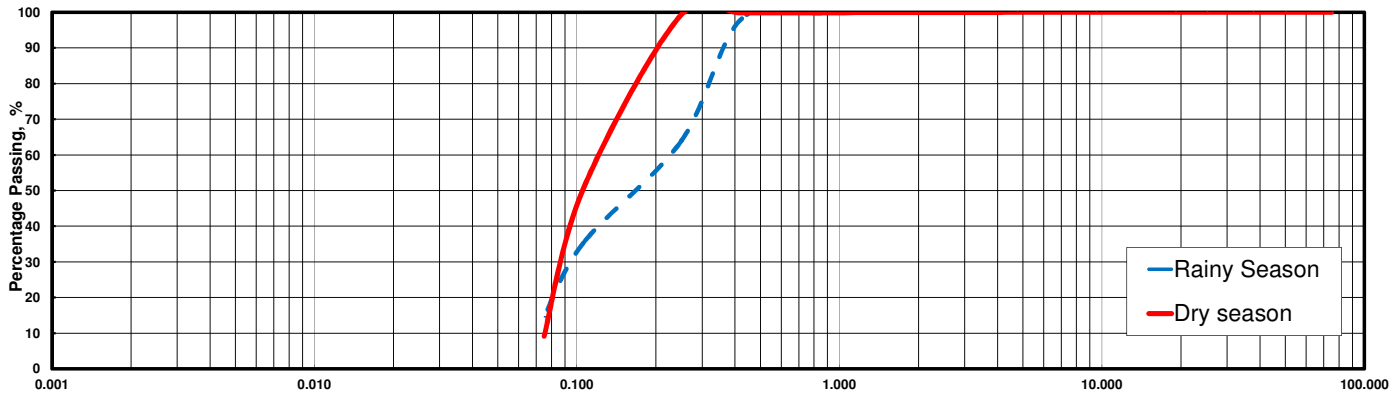
Sample No. : **SL-3-5** Rainy Season Depth : **5.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.8	98.3	64.0	35.4	14.6
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-3-5** Dry Season Depth : **5.00m** (———) Specific Gravity :

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	99.9	99.8	99.4	50.7	9.2
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	SL-3-5 R 5.00m		SL-3-5D 5.00m		Sample No. / Depth	SL-3-5 R 5.00m		SL-3-5D 5.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	4.75	mm
4.75 - 2.00 mm	0.1	%	0.1	%	Dia. at 60%	0.222	mm	0.125	mm
2.00 - 0.425 mm	1.7	%	0.1	%	Dia. at 50%	0.164	mm	0.105	mm
0.425 - 0.075 mm	83.7	%	90.7	%	Dia. at 30%	0.097	mm	0.089	mm
0.075 - 0.005 mm	14.6	%	9.2	%	Dia. at 10%			0.1	
Smaller than 0.005 mm					Coeff. of Uniformity			1.65	
2000um Sieve Passing	99.9	%	99.9	%	Coeff. of Curvature			0.84	
425um Sieve Passing	98.3	%	99.8	%					
75um Sieve Passing	14.6	%	9.2	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **24.09.2014 18.11.2014** Tested By : **Sadamoto** Checked by :

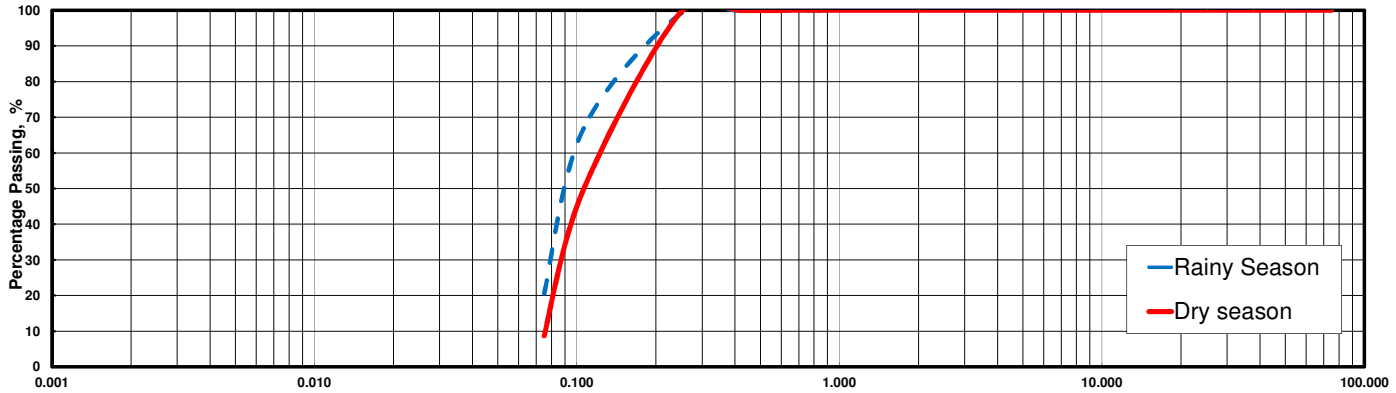
Sample No. : **SL-3-7** Rainy Season Depth : **7.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.3	66.9	20.4
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-3-7** Dry Season Depth : **7.00m** (———————) Specific Gravity :

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	99.9	99.7	49.8	8.7
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	SL-3-7 R 7.00m		SL-3-7 D 7.00m		Sample No. Depth	SL-3-7 R 7.00m		SL-3-7 D 7.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	2.000	mm	0.85	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.101	mm	0.126	mm
2.00 - 0.425 mm	0.1	%	0.1	%	Dia. at 50%	0.093	mm	0.106	mm
0.425 - 0.075 mm	79.5	%	91.2	%	Dia. at 30%	0.081	mm	0.090	mm
0.075 - 0.005 mm	20.4	%	8.7	%	Dia. at 10%			0.1	
Smaller than 0.005 mm					Coeff. of Uniformity			1.67	
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature			0.84	
425um Sieve Passing	99.9	%	99.9	%					
75um Sieve Passing	20.4	%	8.7	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **25.09.2014 18.11.2014** Tested By : **Sadamoto** Checked by :

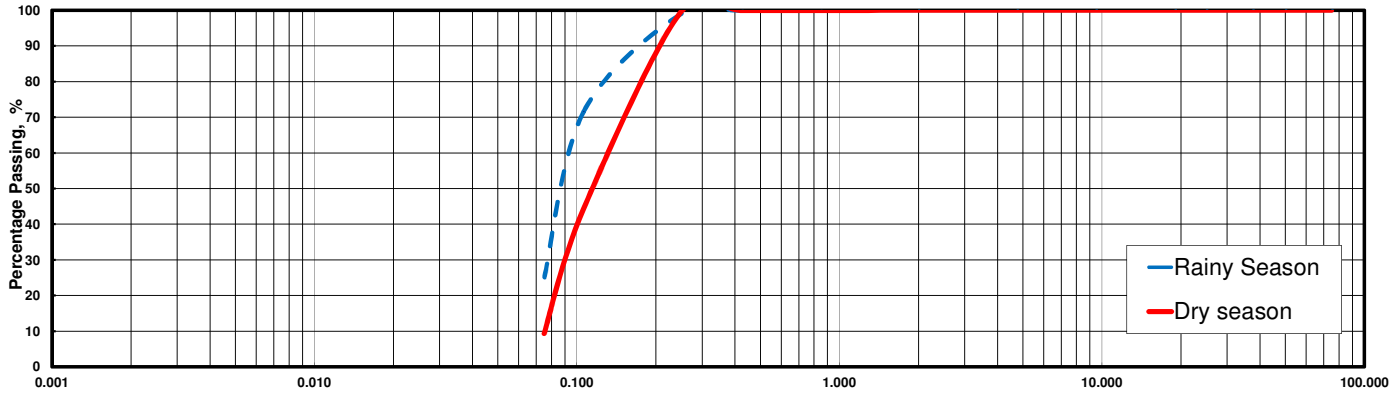
Sample No. : **SL-3-9** Rainy Season Depth : **9.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.0	71.5	24.7
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-3-9** Dry Season Depth : **9.00m** (———————) Specific Gravity :

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	99.9	99.7	44.3	9.4
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	SL-3-9 R 9.00m		SL-3-9D 9.00m		Sample No. Depth	SL-3-9 R 9.00m		SL-3-9D 9.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	2.000	mm	2.00	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.097	mm	0.135	mm
2.00 - 0.425 mm	0.1	%	0.1	%	Dia. at 50%	0.090	mm	0.116	mm
0.425 - 0.075 mm	75.2	%	90.6	%	Dia. at 30%	0.078	mm	0.092	mm
0.075 - 0.005 mm	24.7	%	9.4	%	Dia. at 10%			0.1	
Smaller than 0.005 mm					Coeff. of Uniformity			1.79	
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature			0.83	
425um Sieve Passing	99.9	%	99.9	%					
75um Sieve Passing	24.7	%	9.4	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **25.09.2014 18.11.2014** Tested By : **Sadamoto** Checked by :

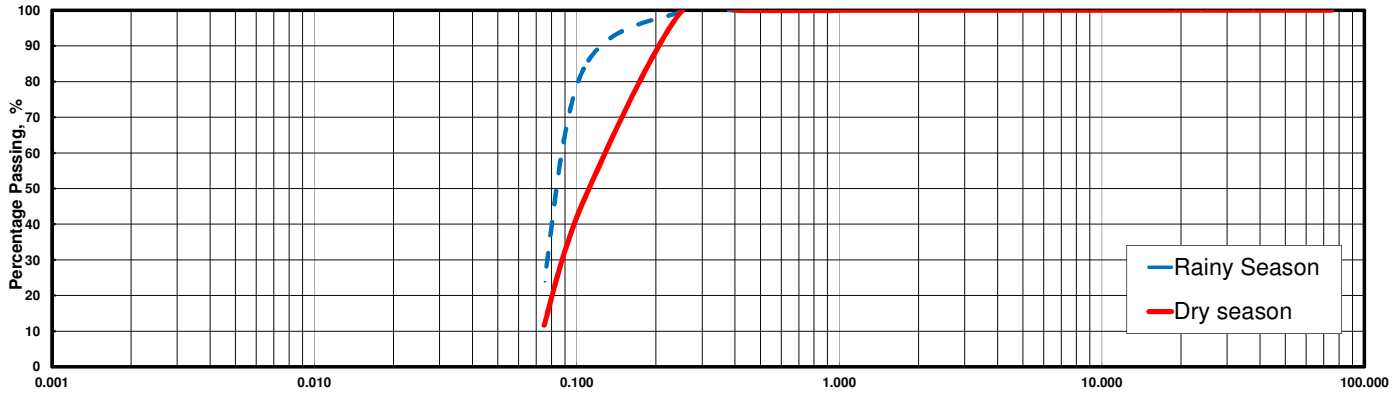
Sample No. : **SL-3-11** Rainy Season Depth : **11.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.6	83.6	23.9
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-3-11** Dry Season Depth : **11.00m** (———————) Specific Gravity :

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	100.0	99.7	46.5	11.7
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	SL-3-11 R 11.00m		SL-3-11D 11.00m		Sample No. Depth	SL-3-11 R 11.00m		SL-3-11D 11.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	2.000	mm	2.00	mm
4.75 - 2.00 mm	0.0	%	0.0	%	Dia. at 60%	0.092	mm	0.132	mm
2.00 - 0.425 mm	0.1	%	0.0	%	Dia. at 50%	0.087	mm	0.112	mm
0.425 - 0.075 mm	76.0	%	88.3	%	Dia. at 30%	0.078	mm	0.090	mm
0.075 - 0.005 mm	23.9	%	11.7	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	100.0	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.9	%	100.0	%					
75um Sieve Passing	23.9	%	11.7	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : 25.09.2014 18.11.2014 Tested By : **Sadamoto** Checked by :

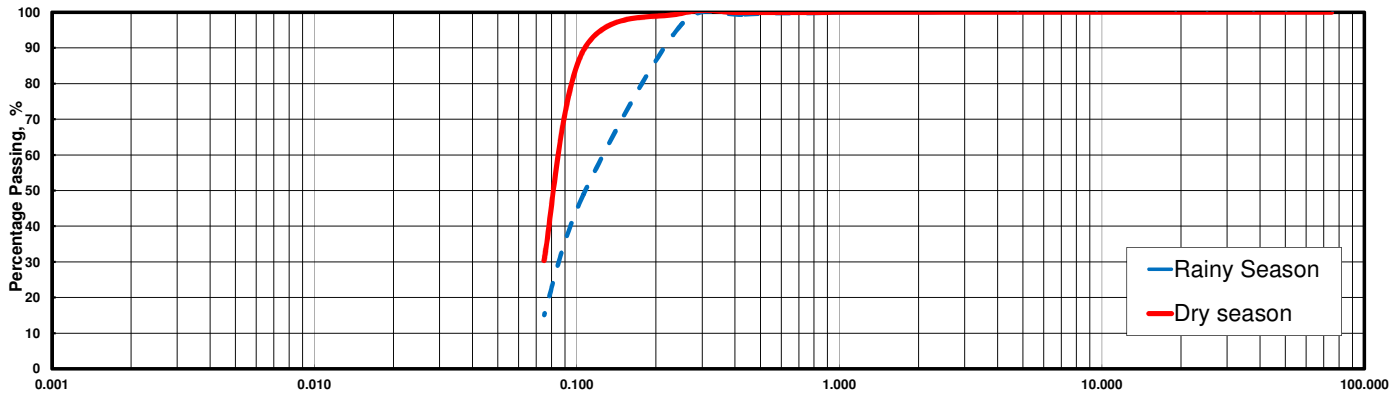
Sample No. : **SL-3-13** Rainy Season Depth : **13.00m** (- - - - - - - - - -) Specific Gravity :

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	99.9	99.8	99.4	96.6	49.0	15.1
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-3-13** Dry Season Depth : **13.00m** (———————) Specific Gravity :

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	99.9	99.7	89.4	30.4
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	SL-3-13 R 13.00m		SL-3-13D 13.00m		Sample No. Depth	SL-3-13 R 13.00m		SL-3-13D 13.00m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	0.00	mm
4.75 - 2.00 mm	0.1	%	0.0	%	Dia. at 60%	0.129	mm	0.089	mm
2.00 - 0.425 mm	0.6	%	0.1	%	Dia. at 50%	0.108	mm	0.084	mm
0.425 - 0.075 mm	84.3	%	69.6	%	Dia. at 30%	0.087	mm		mm
0.075 - 0.005 mm	15.1	%	30.4	%	Dia. at 10%				
Smaller than 0.005 mm					Coeff. of Uniformity				
2000um Sieve Passing	99.9	%	100.0	%	Coeff. of Curvature				
425um Sieve Passing	99.4	%	99.9	%					
75um Sieve Passing	15.1	%	30.4	%					

GRAIN SIZE DISTRIBUTION

Project : **PS on Matarbari USC Coal-fired Power Project**

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

Tested Method : **ASTM D422-63** Date of Testing : **25.09.2014 18.11.2014** Tested By : **Sadamoto** Checked by :

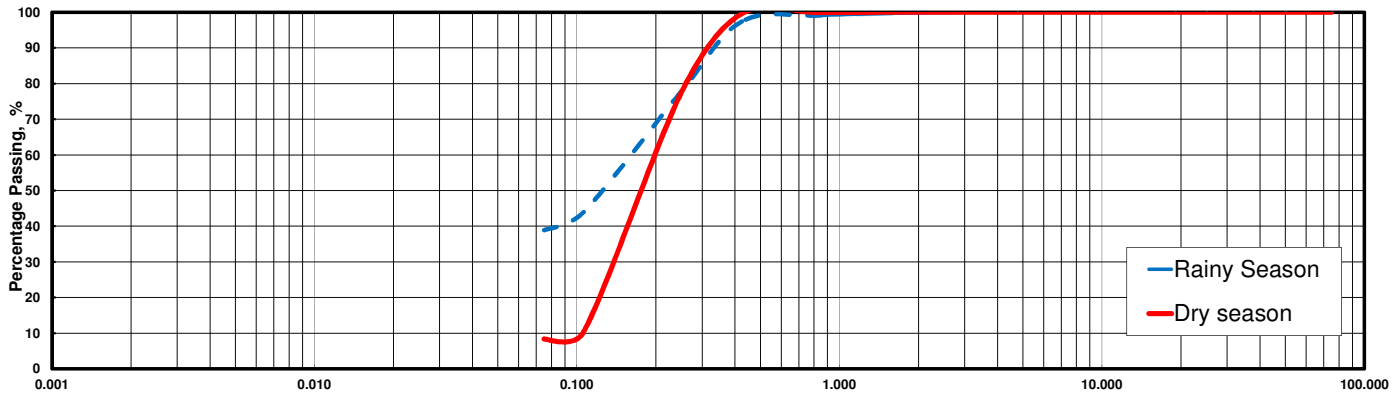
Sample No. : **SL-3-end** Rainy Season Depth : **12.42m** (- - - - - - - - - -) Specific Gravity :

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	99.8	99.1	97.4	77.8	44.0	38.9
Hydro.	Dia., mm															
	% Passing															

Sample No. : **SL-3-end** Dry Season Depth : **12.42m** (———————) Specific Gravity :

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	99.6	77.5	10.3	8.4
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			

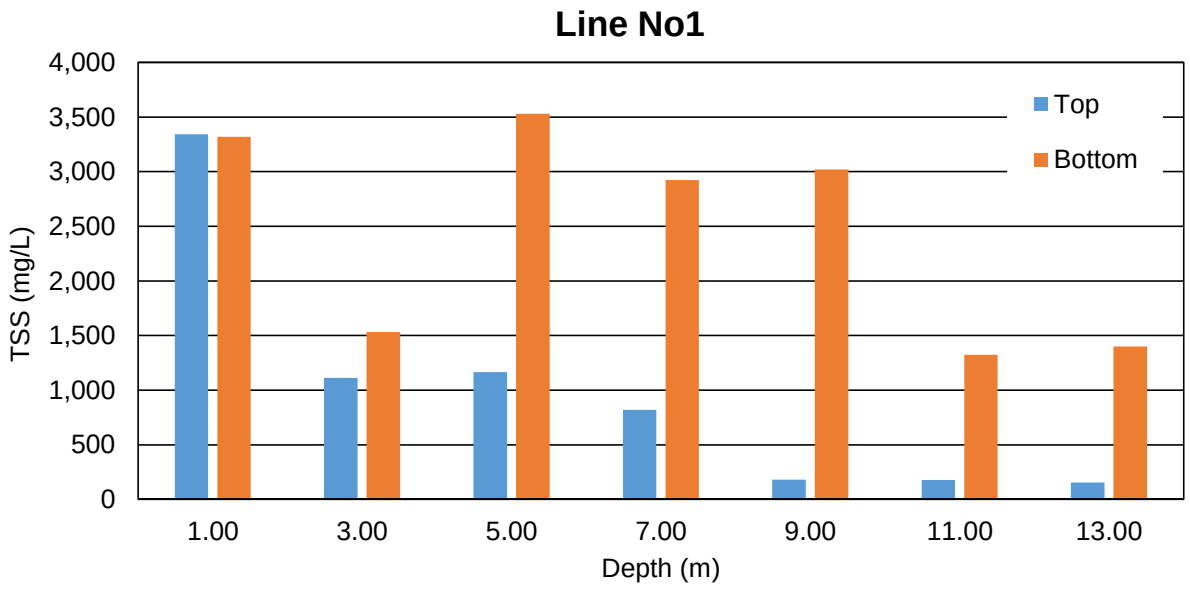
Sample No. Depth	SL-3-end R 12.42m		SL-3-end D 12.42m		Sample No. Depth	SL-3-end R 12.42m		SL-3-end D 12.42m	
Larger than 4.75 mm	0.0	%	0.0	%	Max. Diameter	4.750	mm	2.00	mm
4.75 - 2.00 mm	0.2	%	0.0	%	Dia. at 60%	0.159	mm	0.200	mm
2.00 - 0.425 mm	2.4	%	0.4	%	Dia. at 50%	0.123	mm	0.176	mm
0.425 - 0.075 mm	58.5	%	91.3	%	Dia. at 30%		mm	0.136	mm
0.075 - 0.005 mm	38.9	%	8.4	%	Dia. at 10%			0.1	
Smaller than 0.005 mm					Coeff. of Uniformity			1.99	
2000um Sieve Passing	99.8	%	100.0	%	Coeff. of Curvature			0.93	
425um Sieve Passing	97.4	%	99.6	%					
75um Sieve Passing	38.9	%	8.4	%					

Total Suspended Soilds

Line No: SL-1 **Date:** 2014.09.13 **Weather:** Fine

Tested by: Sadamoto **Checked by:** Teshima

Sample Depth (m)		Cup No	Cup+ Filter (mg)	Sample Volume (ml)	SS+Cup+ Filter (mg)	TSS (mg/L)	Remarks
1.00	Top	1	12831.00	102	13172.00	3343.14	
1.00	Bottom	2	12777.00	50	12943.00	3320.00	
3.00	Top	3	12582.00	88	12680.00	1113.64	
3.00	Bottom	4	12580.00	75	12695.00	1533.33	
5.00	Top	5	12602.00	60	12672.00	1166.67	
5.00	Bottom	6	12820.00	70	13067.00	3528.57	
7.00	Top	7	12566.00	72	12625.00	819.44	
7.00	Bottom	8	12850.00	40	12967.00	2925.00	
9.00	Top	9	12476.00	186	12510.00	182.80	
9.00	Bottom	10	12615.00	100	12917.00	3020.00	
11.00	Top	11	12671.00	118	12692.00	177.97	
11.00	Bottom	12	12674.00	68	12764.00	1323.53	
13.00	Top	13	12572.00	149	12595.00	154.36	
13.00	Bottom	14	12918.00	50	12988.00	1400.00	



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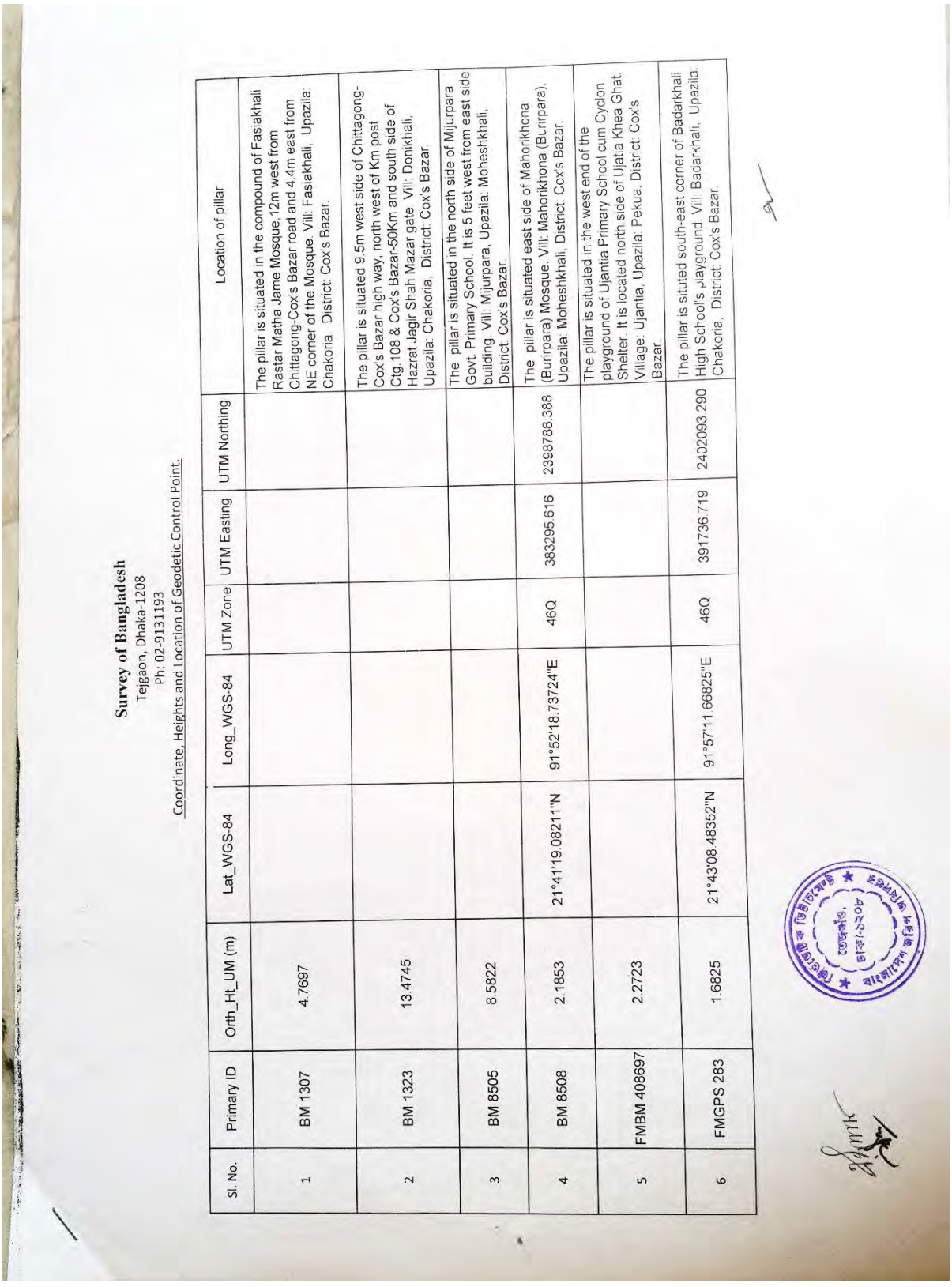
Appendix-C17-04

Reference Data of National Bench Mark

A.1 Reference Data of National Bench Mark



Survey of Bangladesh
Tejgaon, Dhaka-1208
Ph: 02-9131193

Coordinate, Heights and Location of Geodetic Control Point.

Sl. No.	Primary ID	Orth_Ht_UM (m)	Lat_WGS-84	Long_WGS-84	UTM Zone	UTM Easting	UTM Northing	Location of pillar
1	BM 1307	4.7697						The pillar is situated in the compound of Fasiakhali Rastar Matha Jame Mosque.12m west from Chittagong-Cox's Bazar road and 4.4m east from NE corner of the Mosque. Vill: Fasiakhali, Upazila: Chakoria, District: Cox's Bazar.
2	BM 1323	13.4745						The pillar is situated 9.5m west side of Chittagong-Cox's Bazar high way, north west of Km post Ctg.108 & Cox's Bazar-50Km and south side of Hazrat Jagir Shah Mazar gate. Vill: Donikhali, Upazila: Chakoria, District: Cox's Bazar.
3	BM 8505	8.5822						The pillar is situated in the north side of Mijurpara Govt. Primary School. It is 5 feet west from east side building. Vill: Mijurpara, Upazila: Moheshkhali, District: Cox's Bazar.
4	BM 8508	2.1853	21°41'19.08211"N	91°52'18.73724"E	46Q	383295.616	2398788.388	The pillar is situated east side of Mahorikhona (Burirpara) Mosque. Vill: Mahorikhona (Burirpara), Upazila: Moheshkhali, District: Cox's Bazar.
5	FMBM 408697	2.2723						The pillar is situated in the west end of the playground of Ujantia Primary School cum Cyclon Shelter. It is located north side of Ujatia Khea Ghat. Village: Ujantia, Upazila: Pekua, District: Cox's Bazar.
6	FMGPS 283	1.6825	21°43'08.48352"N	91°57'11.66825"E	46Q	391736.719	2402093.290	The pillar is situted south-east corner of Badarkhali High School's playground. Vill: Badarkhali, Upazila: Chakoria, District: Cox's Bazar.

7	FMGPS 304	2.7529						The pillar is situated in the compound of Matarbari High School. It is south side of the school building and north side of toilet. Village: Matarbari, Upazila: Maheshkhali, District: Cox's Bazar.
8	GPS 280A	2.8069	21°47'01.09835"N	91°51'13.21441"E	46Q	381490.504	2409319.071	The pillar is situated south side of Red Crescent Cyclone Shelter cum Primary School. About 1.25km west from Ali Akbar Deil ghat. Vill: Ali Akbar Deil, Upazila: Kutubdia, District: Cox's Bazar.
9	GPS 282	2.1323	21°43'08.75539"N	91°57'07.60205"E	46Q	391619.945	2402102.440	The pillar is situted south-west corner of Badarkhali High School's playground. It is south - east of Badarkhali Union Parishad office. Vill: Badarkhali, Upazila: Chakoria, District: Cox's Bazar.
10	GPS 322	4.6373	21°39'49.54172"N	92°04'30.39946"E	46Q	404305.717	2395895.981	The pillar is situated south-west side of the playground of Maijpara Reg. Primary School at Dulahazra . It is about 77 feet south - west from the south -west cnrner of the school building. Vill: Maijpara, Upazila: Chakoria, District
11	GPS 6010	2.4344	21°43'19.44008"N	91°53'05.62809"E	46Q	384669.838	2402479.557	The pillar is situated south-west corner of Sreejoni Kinder Garden Pre Cadet School. It is south side of Nurmohammad's house & west side of Mogdail Bazar. Vill: Mogdail, Upazila: Moheshkhali, District: Cox's Bazar.

Note: These values are not to be co-ordinated to any other person/ organisation except this project.

Prepared by:

Checked by:

04.09.2014

Ganesh Chandra Roy
Assistant Director (Survey)
Incharge, Geodetic Detachment
Survey of Bangladesh, Dhaka.

A.3 AS BUILT COODINATES AND THE ELEVATION OF SI POINTS AND LINES

Swedish Weight Sounding locations

SWS No	Point name	As built coordinates		Z (m)
		North (m)	East(m)	
1	SW-10a-13a	2400321.062	382480.849	0.42
2	SW-10a-14	2400119.573	382270.287	1.17
3	SW-10a-15	2399919.982	382384.630	1.37
4	SW-11a-9	2401138.266	382944.513	-0.78
5	SW-11a-13a	2400319.966	382869.291	1.53
6	SW-11a-15	2399912.911	382945.543	1.07
7	SW-12-10	2400996.096	383067.613	1.87
8	SW-12-14	2400120.042	383069.750	1.35
9	SW-12a-11	2400718.406	383327.487	1.48
10	SW-12a-12a	2400505.139	383269.325	1.54
11	SW-12a-15	2399866.594	383269.280	1.26
12	SW-13-13	2400356.684	383475.689	1.67
13	SW-13-15	2399919.281	383469.065	1.35
14	SW-13-16	2399803.751	383469.245	1.56
15	SW-14-12	2400522.668	383758.032	1.37
16	SW-14-14	2400120.095	383758.145	1.11
17	SW-14-15	2399922.102	383742.370	1.19
18	SW-16-11	2400724.609	384023.229	1.20
19	SW-16-12	2400526.710	384024.991	1.11
20	SW-16-13	2400357.630	384023.208	1.05
21	SW-16-14	2400120.125	384024.510	1.11
22	SW-16-15	2399918.375	384020.889	1.21
23	SW-16-17	2399681.515	384023.401	1.08
24	SW-17-14	2400119.995	384179.120	0.82
25	SW-18-11	2400724.932	384338.015	1.00
26	SW-18-12	2400523.713	384334.914	1.04
27	SW-18-13	2400358.209	384337.657	0.90
28	SW-18-14	2400120.170	384337.605	0.84
29	SW-18-15	2399919.024	384338.036	0.89

30	SW-18-17	2399681.497	384338.121	1.07
31	SW-19-17	2399680.605	384491.123	1.13
32	SW-20-11	2400723.558	384642.019	0.98
33	SW-20-12	2400525.667	384643.545	0.89
34	SW-20-13	2400361.979	384642.322	0.82
35	SW-20-14	2400120.578	384622.916	0.96
36	SW-20-15	2399921.604	384641.535	0.98
37	SW-20-17	2399679.966	384641.958	0.97
38	SW-21-14	2400119.981	384791.119	0.79
39	SW-22-11	2400723.399	384942.532	0.92
40	SW-22-12	2400522.422	384938.189	0.00
41	SW-22-13	2400362.213	384940.343	0.73
42	SW-22-15	2399923.669	384940.923	0.67
43	SW-22-16	2399805.418	384943.270	0.69
44	SW-24-11	2400725.392	385290.258	0.89
45	SW-24-12	2400525.824	385293.528	1.02
46	SW-24-14	2400120.010	385292.175	0.68

Drilling locations

BH No	Point name	As built coordinates		Z (m)
		North (m)	East (m)	
1	OF-02-1	2399700.613	380826.796	-15.24
2	OF-03-1	2399923.312	381302.168	-11.83
3	OF-03-1a	2400316.931	381415.040	-11.26
4	OF-03-1b	2400713.360	381558.041	-10.50
5	OF-03-1c	2399514.593	381154.282	-13.36
6	OF-04-1	2400320.199	381830.853	-6.99
7	OF-04-2	2400123.998	381751.555	-8.00
8	OF-04-3	2399925.546	381685.210	-6.94
9	OF-05-1	2400309.574	382227.532	-1.04
10	OF-05-1a	2400717.475	382356.120	-1.38
11	OF-05-1b	2401124.501	382494.709	-1.94
12	OF-05-2	2400114.544	382171.452	-0.06
13	OF-05-3	2399933.033	382085.862	-0.99

14	OF-05-3a	2399517.846	381960.074	-0.15
15	OF-05-3b	2399110.706	381819.920	-1.71
16	LD-12-1	2400120.419	383068.868	1.43
17	LD2-10a-1	2400119.954	382463.849	0.45
18	LD2-11-1	2400120.336	382669.581	1.50
19	LD2-11-1a	2400362.622	382669.301	0.16
20	LD2-11-1b	2399921.608	382669.208	1.64
21	LD2-12-1a	2400362.700	383069.833	0.94
22	LD2-12-1b	2399921.465	383069.018	1.33
23	LD2-13-1	2400518.785	383469.984	1.38
24	LD2-13-2	2400120.520	383473.460	1.34
25	LD2-13-3	2399680.090	383469.277	1.06
26	PP-14-1	2400522.219	383758.291	1.27
27	PP-14-2	2400120.086	383745.414	1.02
28	PP-14-3	2399680.037	383757.140	1.26
29	PP-17-1	2400112.759	384144.803	1.35
30	PP-21-1	2400362.657	384791.125	0.57
31	PP-21-2	2400114.873	384808.766	1.12
32	PP-21-3	2399801.120	384785.112	1.03
33	PP-24-1	2400120.101	385294.216	0.68
34	PP3-15-1	2400362.638	383867.147	1.08
35	PP3-15-2	2399802.402	383860.146	1.32
36	PP3-17-1	2400362.661	384179.147	1.00
37	PP3-17-2	2399802.417	384179.171	0.97
38	PP3-19-1	2400363.246	384491.452	1.25
39	PP3-19-2	2400120.458	384491.550	0.87
40	PP3-19-3	2399802.407	384491.114	1.08
41	PP3-23-1	2400362.678	385091.133	0.73
42	PP3-23-2	2400120.440	385111.240	0.20
43	PP3-23-3	2399786.852	385101.273	-0.15
44	PP3-24-1	2400366.089	385292.696	0.95
45	PP3-24-2	2399904.297	385281.191	0.89

Marine seismic survey lines

	MSS line name	No	Coordinate	
			N (m)	E (m)
1	MSS-SN-01	n	2,400,920	380,825
		s	2,399,320	380,292
2	MSS-SN-02	n	2,400,920	381,225
		s	2,399,320	380,692
3	MSS-SN-03	n	2,400,920	381,625
		s	2,399,320	381,092
4	MSS-SN-04	n	2,400,920	382,025
		s	2,399,320	381,492
5	MSS-SN-05	n	2,401,220	382,525
		s	2,399,019	381,791
6	MSS-WE-10a	w	2,400,920	380,825
		e	2,400,920	382,425
7	MSS-WE-11	w	2,400,720	380,758
		e	2,400,720	382,358
8	MSS-WE-12	w	2,400,520	380,692
		e	2,400,520	382,292
9	MSS-WE-13a	w	2,400,320	380,625
		e	2,400,321	382,225
10	MSS-WE-14	w	2,400,120	380,558
		e	2,400,121	382,159
11	MSS-WE-15	w	2,399,920	380,492
		e	2,399,921	382,092
12	MSS-WE-16a	w	2,399,720	380,425
		e	2,399,720	382,025
13	MSS-WE-17a	w	2,399,520	380,358
		e	2,399,520	381,958
14	MSS-WE-18a	w	2,399,320	380,292
		e	2,399,320	381,892
15	MSS-CL-01	a	2,399,320	380,482
		b	2,399,520	380,593
		c	2,399,679	380,681
		d	2,400,120	381,585
		e	2,400,121	382,159
		f	2,400,120	382,669

Sea bottom sediment survey lines

No	BSS Line No.	Points name	Coordinate	
			N (m)	E (m)
1	Line 1	1a	2,399,905	382,520
		1b	2,401,084	380,303
2	Line 2	2a	2,400,376	382,744
		2b	2,401,534	380,555
3	Line 3	3a	2,399,493	382,269
		3b	2,400,643	380,056

Appendix-C17-05

Entry Permission

কোল পাওয়ার জেনারেশন কোম্পানী বাংলাদেশ লিমিটেড
Coal Power Generation Company Bangladesh Limited (CPGCBL)
(An enterprise of Government of Peoples Republic of Bangladesh)
বিদ্যুৎ ভবন, ৯তলা, কক্ষ নং-৯১৮, ১ আব্দুল গণি রোড, ঢাকা-১০০০

Memo No. 999/CPGCBL/MD/2014 Date: 11/08/2014

Deputy Team Leader
JICA Study Team

Subject : Entry Permission to Conduct Environmental Survey for the Construction of Matarbari Ultra Super Critical Coal Fired Power Plant.

Ref. No.: Your Email dated 12/08/2014

Dear Sir:

With respect to above subject matter and minutes of discussion signed between JICA and the Government of Bangladesh on 3rd March 2014, and as desired by the JICA Study Team, following members of JICA Study Team are permitted to conduct the environmental survey for the Construction of Matarbari Ultra Super Critical Coal Fired Power Plant starting from 24th August 2014 to till the completion of the survey.

Sl. No.	Name	Designation	Passport No
1		Deputy Team Leader / General Soil Investigation Evaluation	
2		Sand Transportation Analysis Expert	
3		Port and Channel Engineering Expert (Marine Area)	
4		Environmental and Social Consideration Expert	
5		Port and Channel Engineering Expert (Land Area)	
6		Land Development Engineering Expert	
7		Construction Material Procurement Expert	
8		Site Manager	
9		Assistant Site Manager, Technical	
10		Assistant Site Manager, Administration	
11		Site Supervisor	
12		Chief Geophysicist	
13		Geophysicist	
14		Geophysicist	
15		Geophysicist	
16		Site Supervisor	
17		Site Supervisor	
18		Site Supervisor	

Sincerely Yours,

Managing Director

Copy

1. PS to Secretary, Power Division, MPEMR
2. Chief Representative, JICA, Dhaka Office
3. Company Secretary, CPGCBL
2. Office File