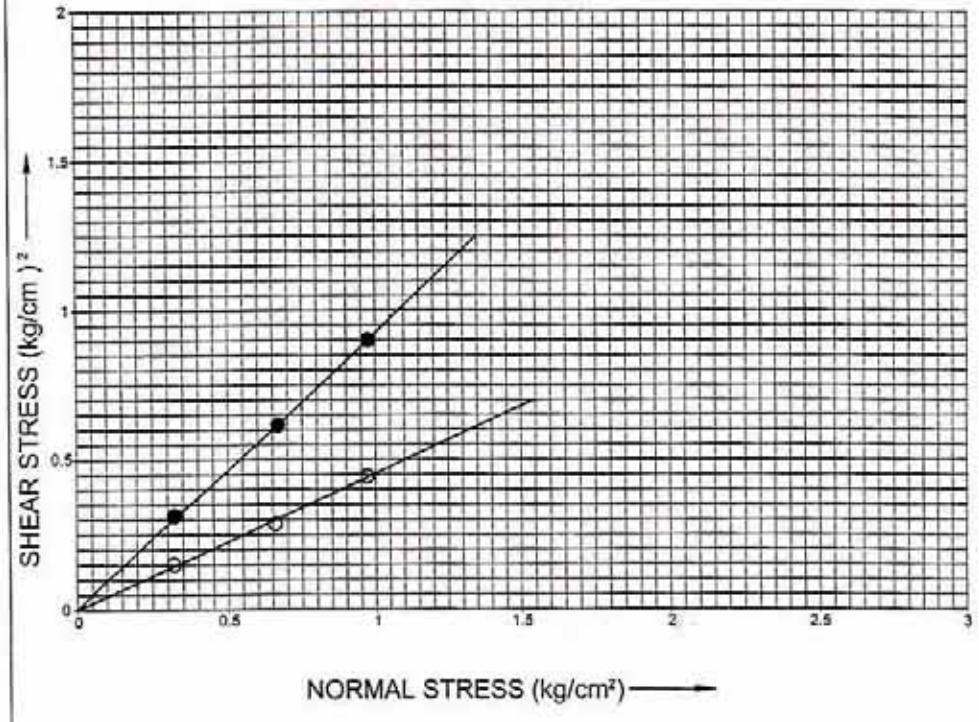
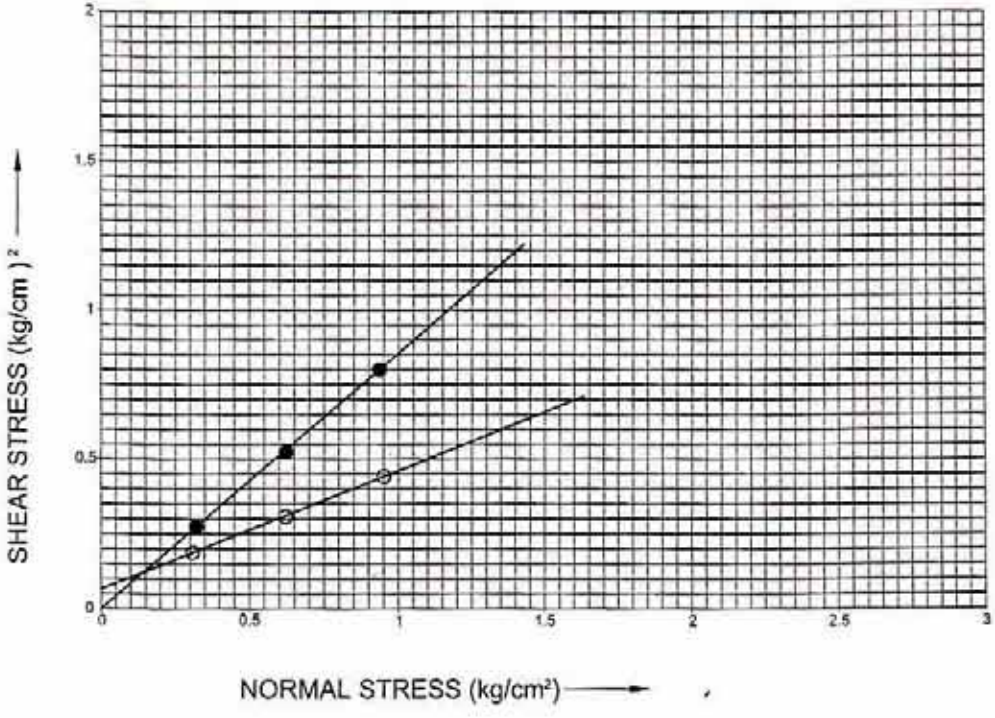
GRAIN SIZE ANALYSIS / DIRECT SHARE TEST

DIRECT SHEAR TEST

Client :-TEPSCO
Location :-Bheramara Power Station Area, Kushtia Bangladesh.
Project :-Feasibility Study on 450MW Combined Cycle Power Station at Bheramara





SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	COHESION (kg/cm)	ANGLE (0)
o—o	1	D - 10	10m	00	25
●—●	1	D - 24	24m	00	44

SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	COHESION (kg/cm)	ANGLE (0)
o—o	2	D - 6	6m	0.05	00
●—●	2	D - 21	21m	00	40

GRAIN SIZE ANALYSIS

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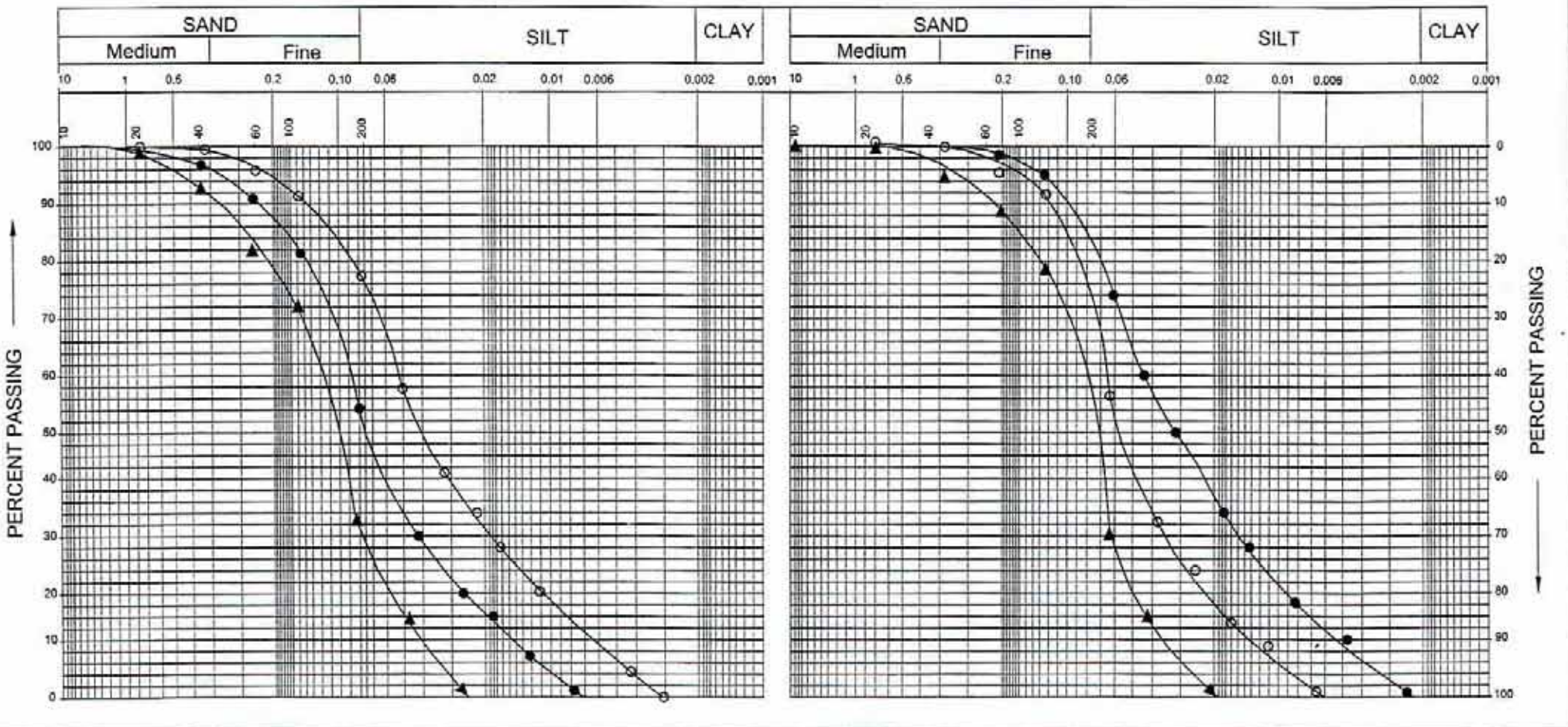

SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	SAND(%)	SILT(%)	CLAY(%)
o—o	1	D - 2	2m	23	77	00
●—●	1	D - 4	4m	47	53	00
▲—▲	1	D - 20	20m	68	32	00

SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	SAND(%)	SILT(%)	CLAY(%)
o—o	2	D - 6	6m	45	55	00
●—●	2	D - 17	17m	26	74	00
▲—▲	2	D - 28	28m	70	30	00

DIRECT SHEAR TEST

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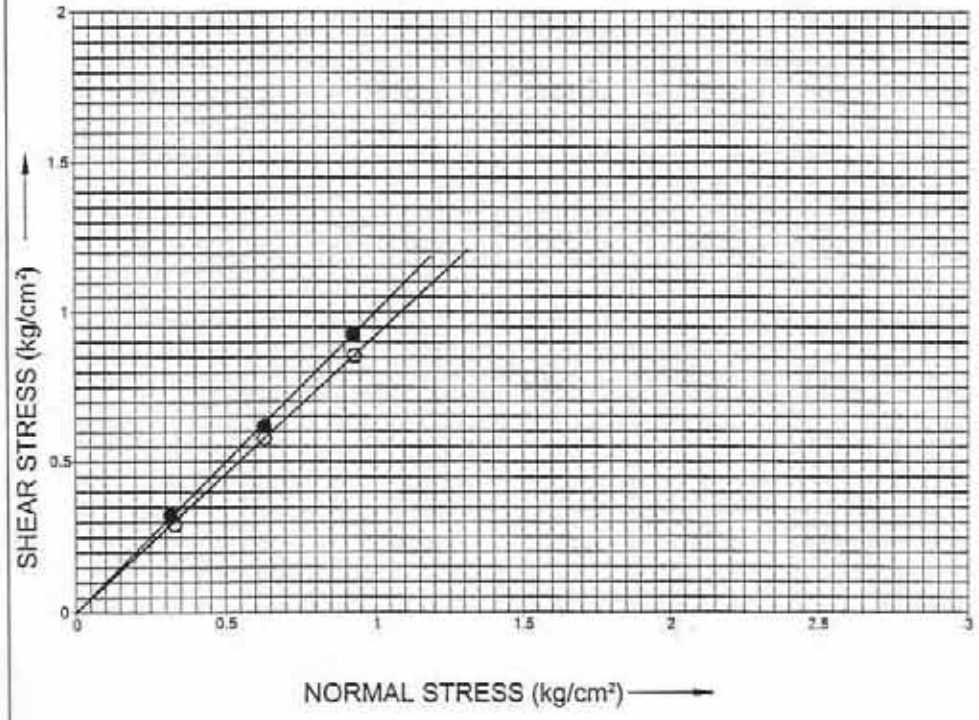
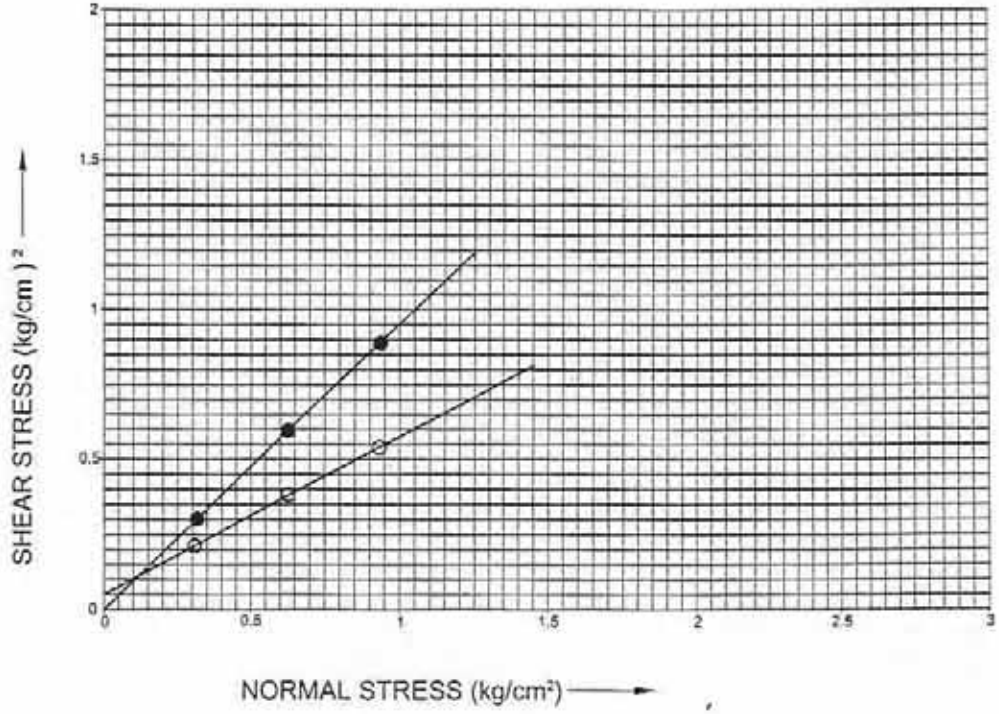
Project :-Feasibility Study on 450MW Combined Cycle Power Station at Bheramara



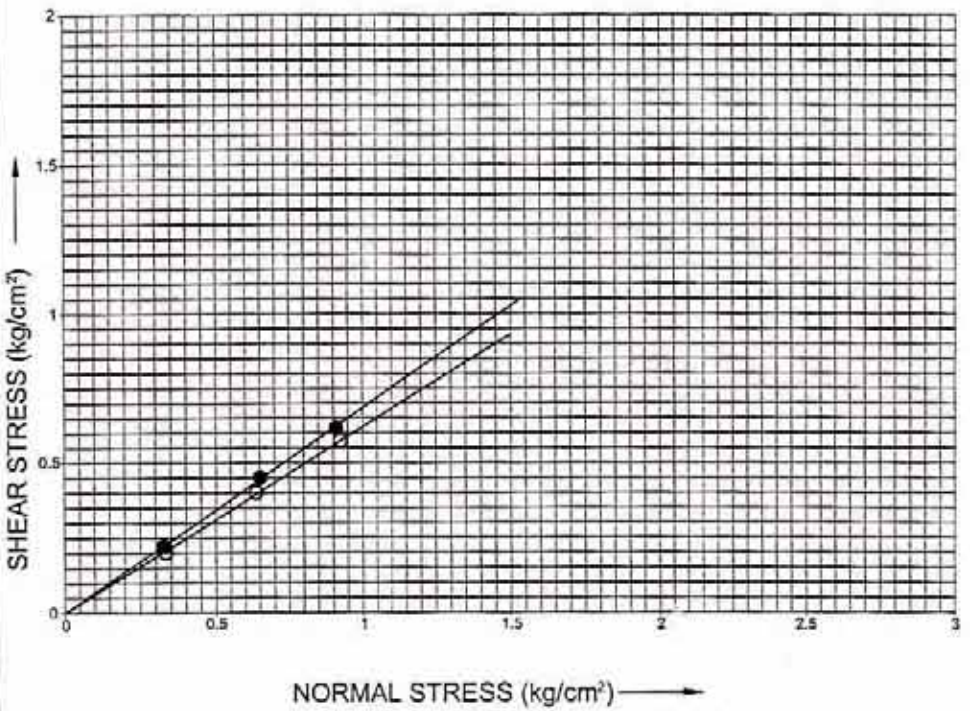


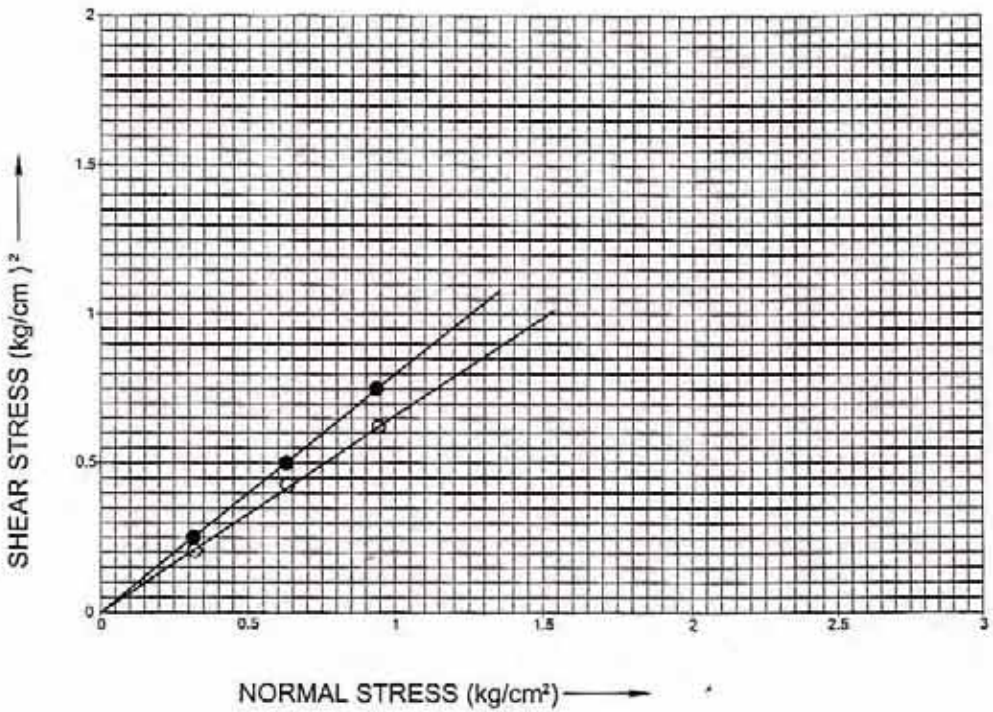
SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	COHESION (kg/cm)	ANGLE (0)
O—O	3	D - 8	8m	00	42
●—●	3	D - 25	25m	00	44

SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	COHESION (kg/cm)	ANGLE (0)
O—O	4	D - 11	11m	0.05	27
●—●	4	D - 23	23m	00	43

DIRECT SHEAR TEST

Client :-TEPSCO
Location :-Bheramara Power Station Area, Kushtia Bangladesh.
Project :-Feasibility Study on 450MW Combined Cycle Power Station at Bheramara





SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	COHESION (kg/cm)	ANGLE (0)
o—o	5	D - 13	13m	00	32
●—●	5	D - 25	25m	00	34

SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	COHESION (kg/cm)	ANGLE (0)
o—o	6	D - 12	12m	00	33
●—●	6	D - 27	27m	00	38

GRAIN SIZE ANALYSIS

Client :-TEPSCO
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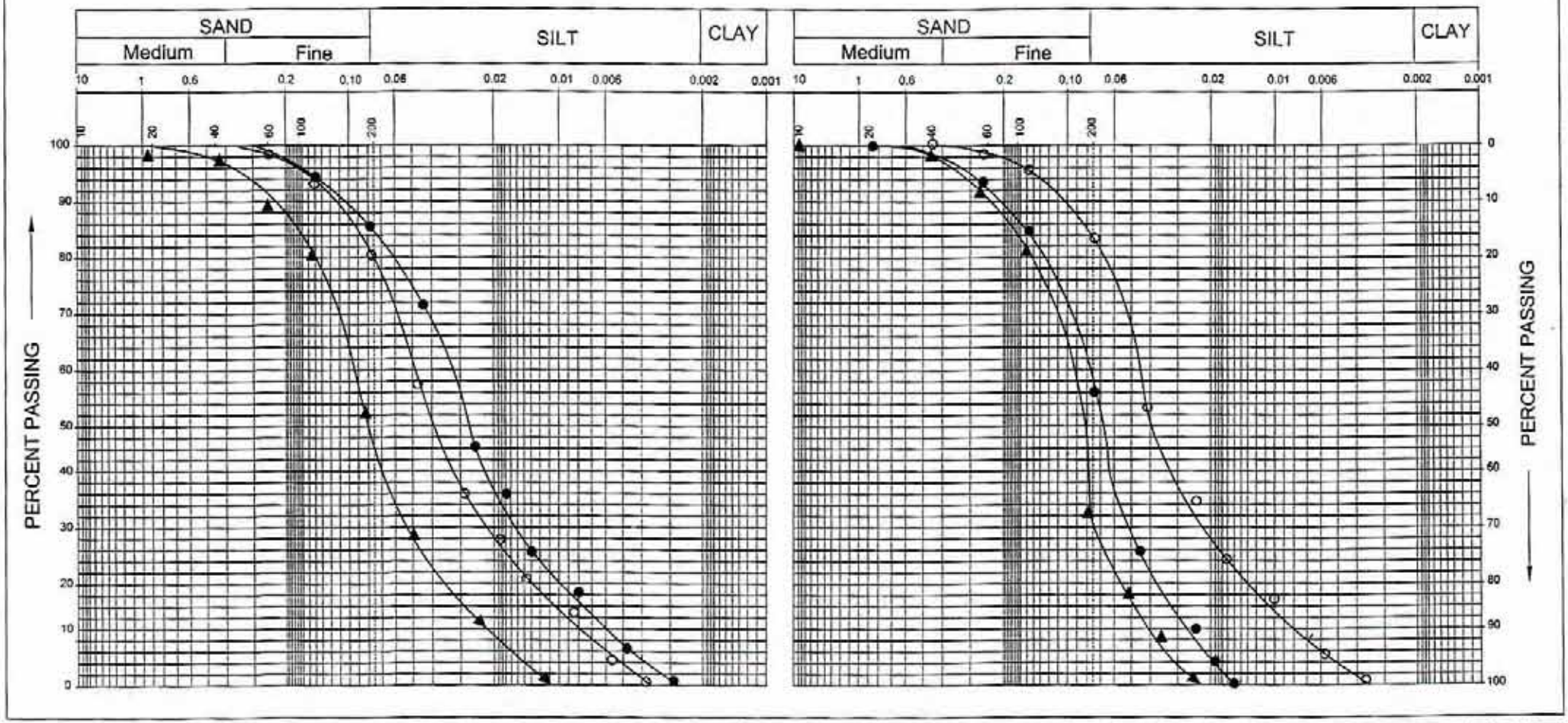
Project :-Feasibility Study on 450MW Combined Cycle Power Station at Bheramara



SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	SAND(%)	SILT(%)	CLAY(%)
o—o	5	D - 2	2m	20	80	00
●—●	5	D - 6	6m	15	85	00
▲—▲	5	D - 19	19m	49	51	00

SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	SAND(%)	SILT(%)	CLAY(%)
o—o	6	D - 5	5m	17	83	00
●—●	6	D - 15	15m	45	55	00
▲—▲	6	D - 25	25m	68	32	00

DIRECT SHEAR TEST

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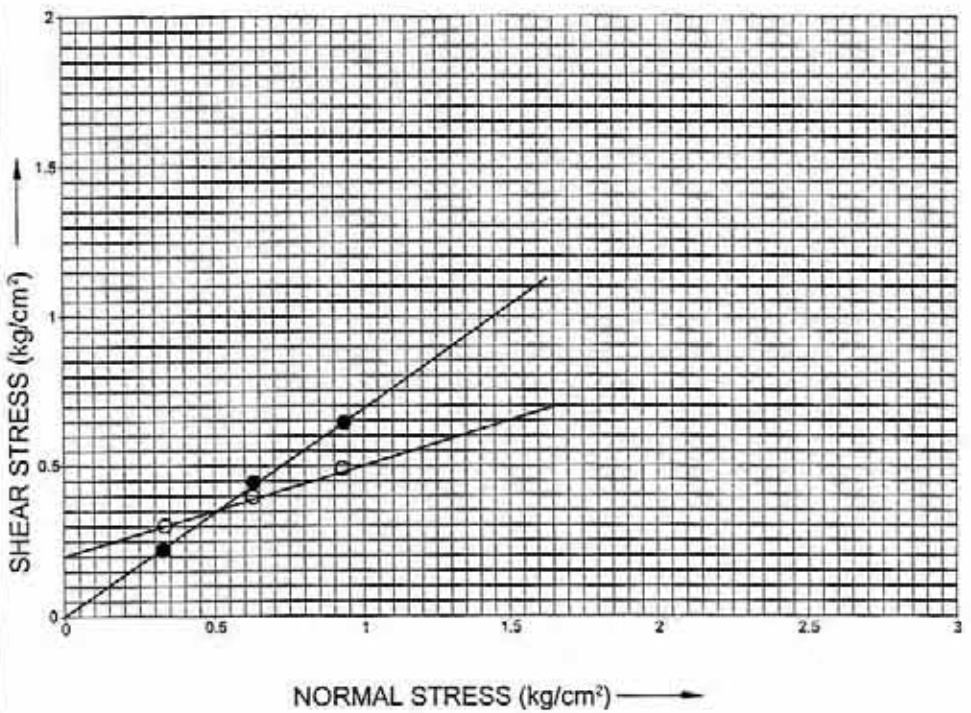
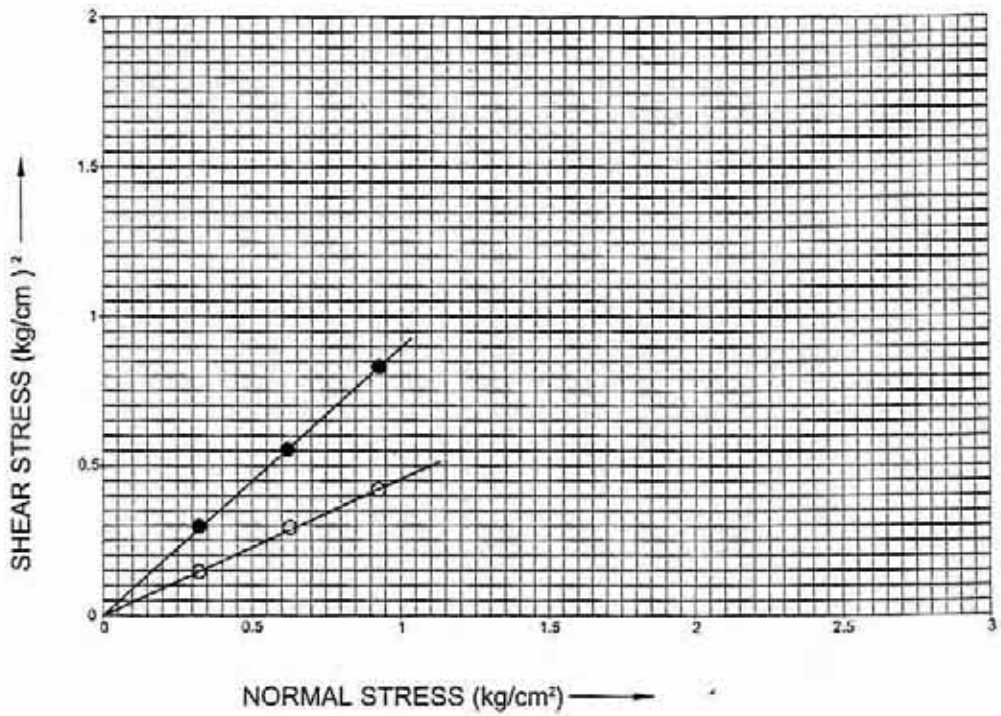


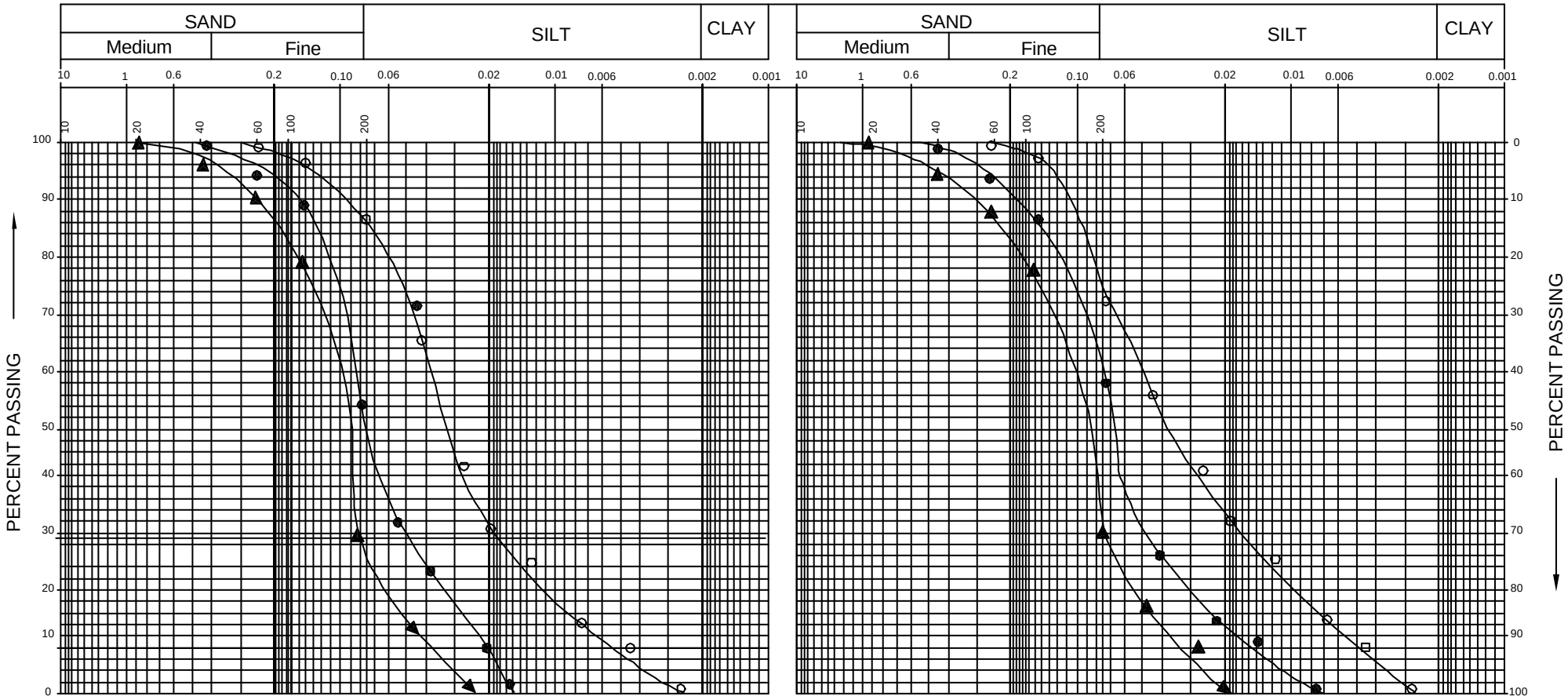


SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	COHESION (kg/cm)	ANGLE (0)
o—o	7	D - 10	10m	0.20	17
●—●	7	D - 23	23m	00	35

SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	COHESION (kg/cm)	ANGLE (0)
o—o	8	D - 17	17m	00	24
●—●	8	D - 27	27m	00	45

GRAIN SIZE ANALYSIS

Client :-TEPSCO
Location :-Bheramara Power Station Area, Kushtia Bangladesh.
Project :-Feasibility Study on 450MW Combined Cycle Power Station at Bheramara



SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	SAND(%)	SILT(%)	CLAY(%)
○—○	7	D - 7	7m	14	86	00
●—●	7	D - 14	14m	47	53	00
▲—▲	7	D - 29	25m	71	29	00

SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	SAND(%)	SILT(%)	CLAY(%)
○—○	8	D - 7	7m	28	72	00
●—●	8	D - 9	9m	43	57	00
▲—▲	8	D - 23	23m	70	30	00

DIRECT SHEAR TEST

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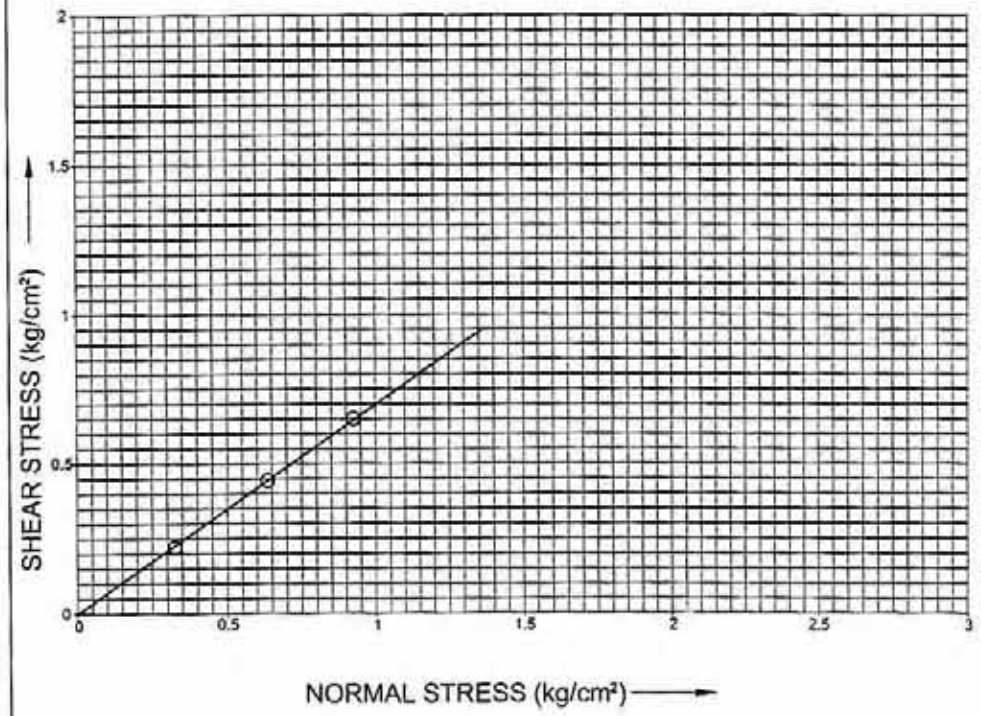

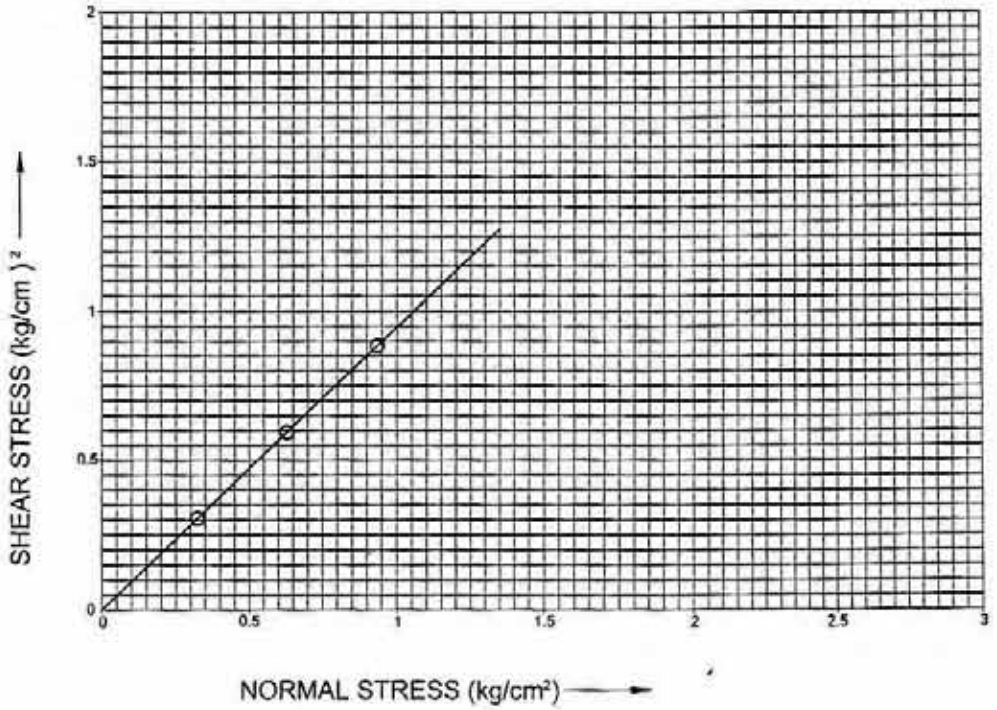

SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	COHESION (kg/cm)	ANGLE (0)
o—o	9	D - 13	13m	00	35
●—●					

SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	COHESION (kg/cm)	ANGLE (0)
o—o	9	D - 26	26m	00	42
●—●					

GRAIN SIZE ANALYSIS

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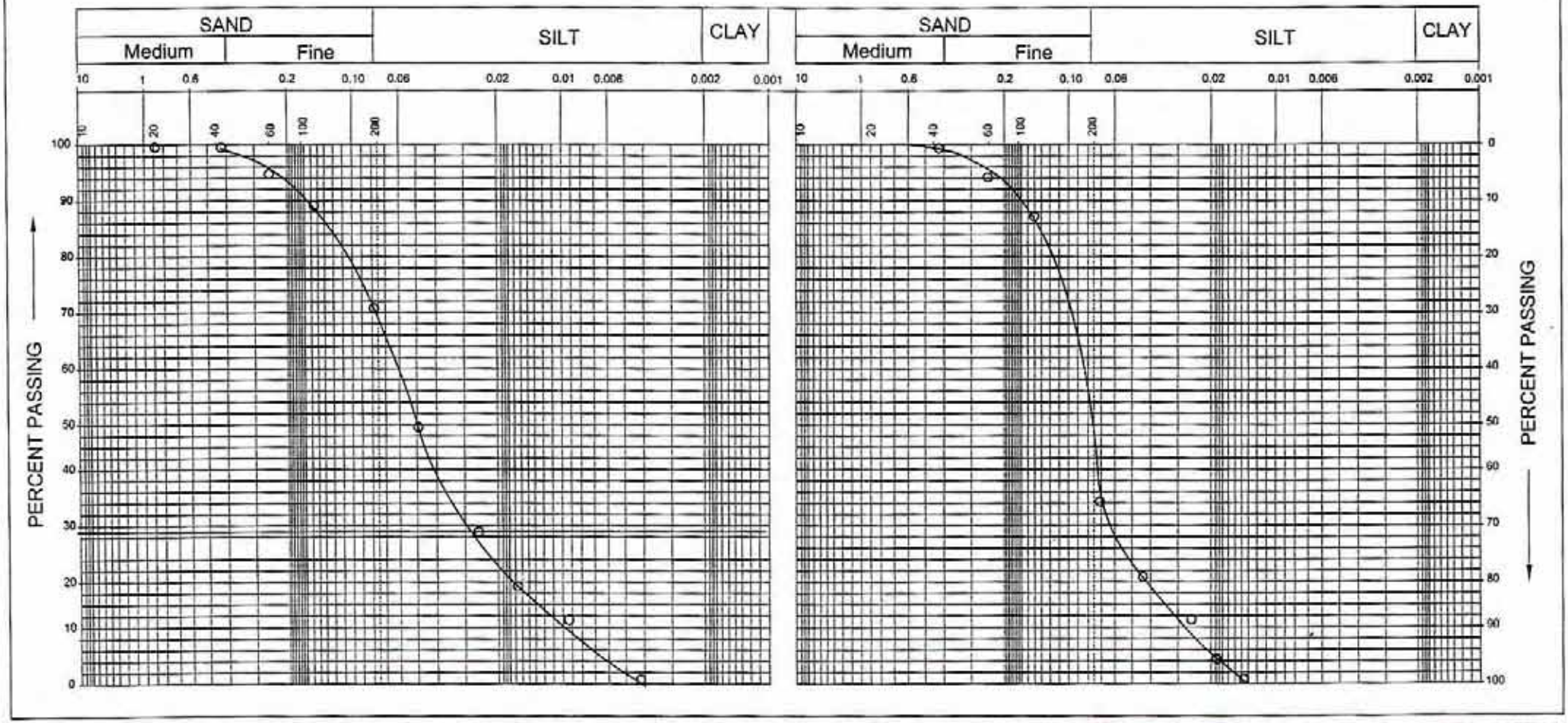
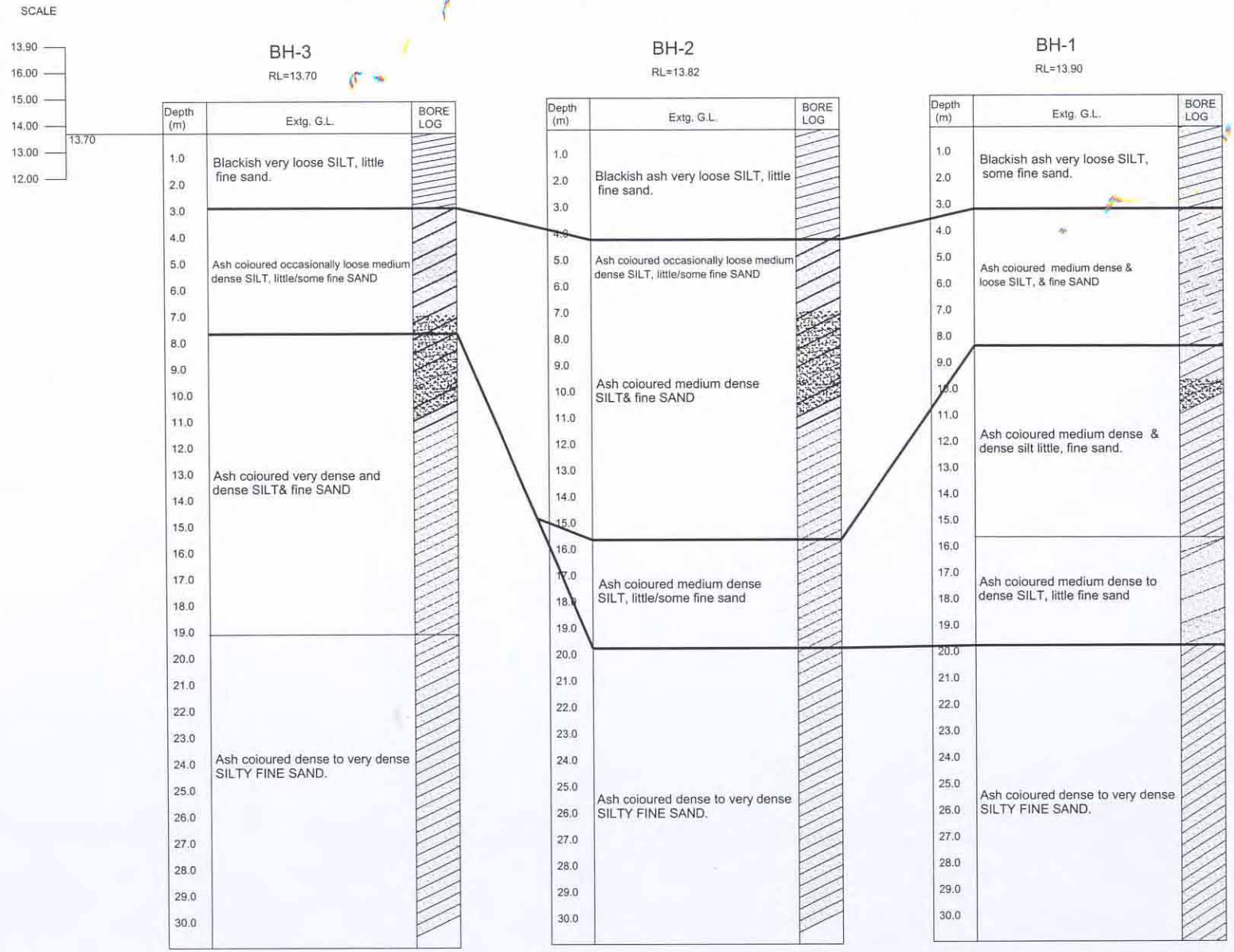


SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	SAND(%)	SILT(%)	CLAY(%)
○—○	9	D - 9	9m	30	70	00
●—●						
▲—▲						

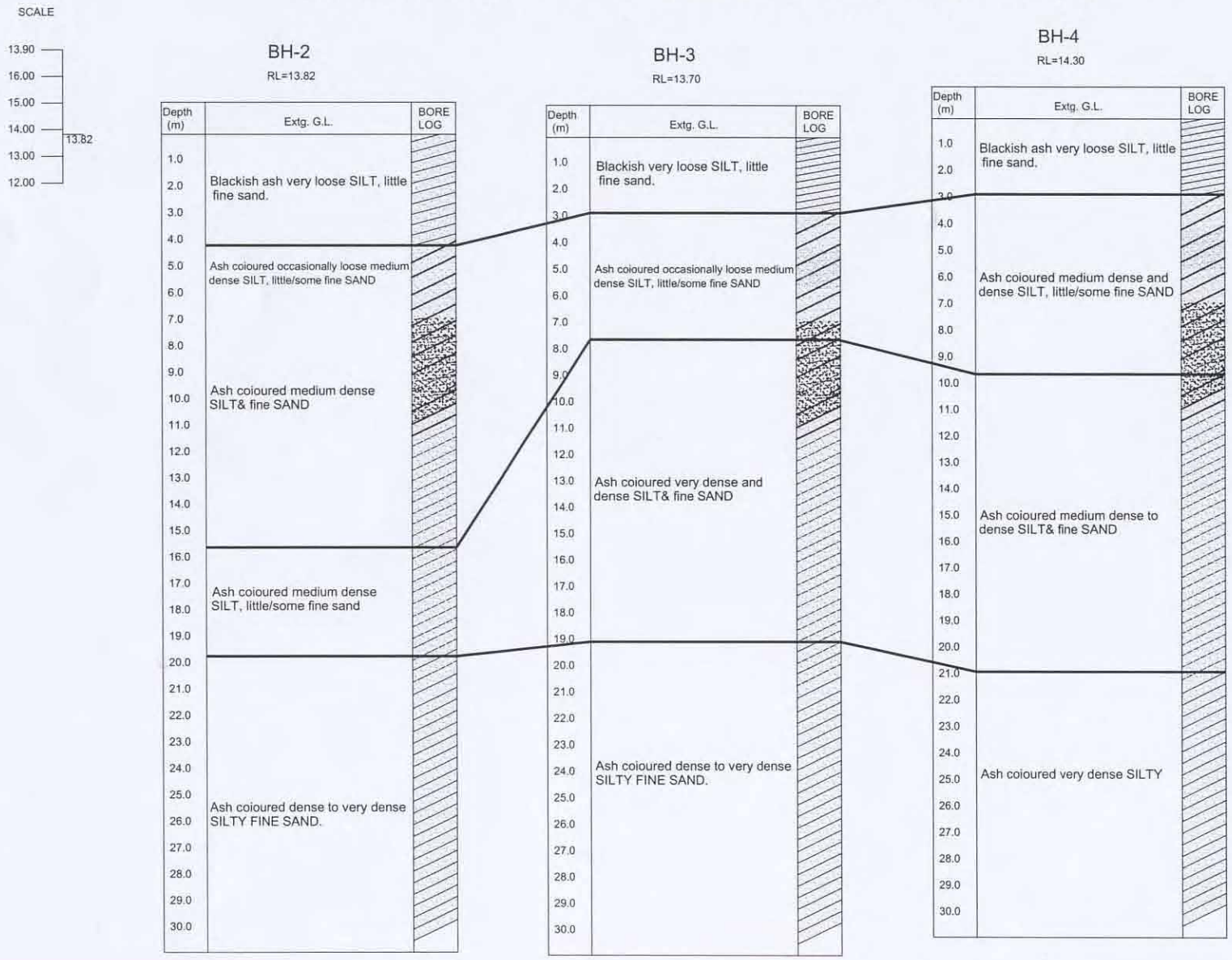
SYMBOL	BORING NO	SAMPLE NO	DEPTH (m)	SAND(%)	SILT(%)	CLAY(%)
○—○	9	D - 20	20m	66	34	00
●—●						
▲—▲						

LONGITUDINAL CROSS SECTION OF BORE HOLE

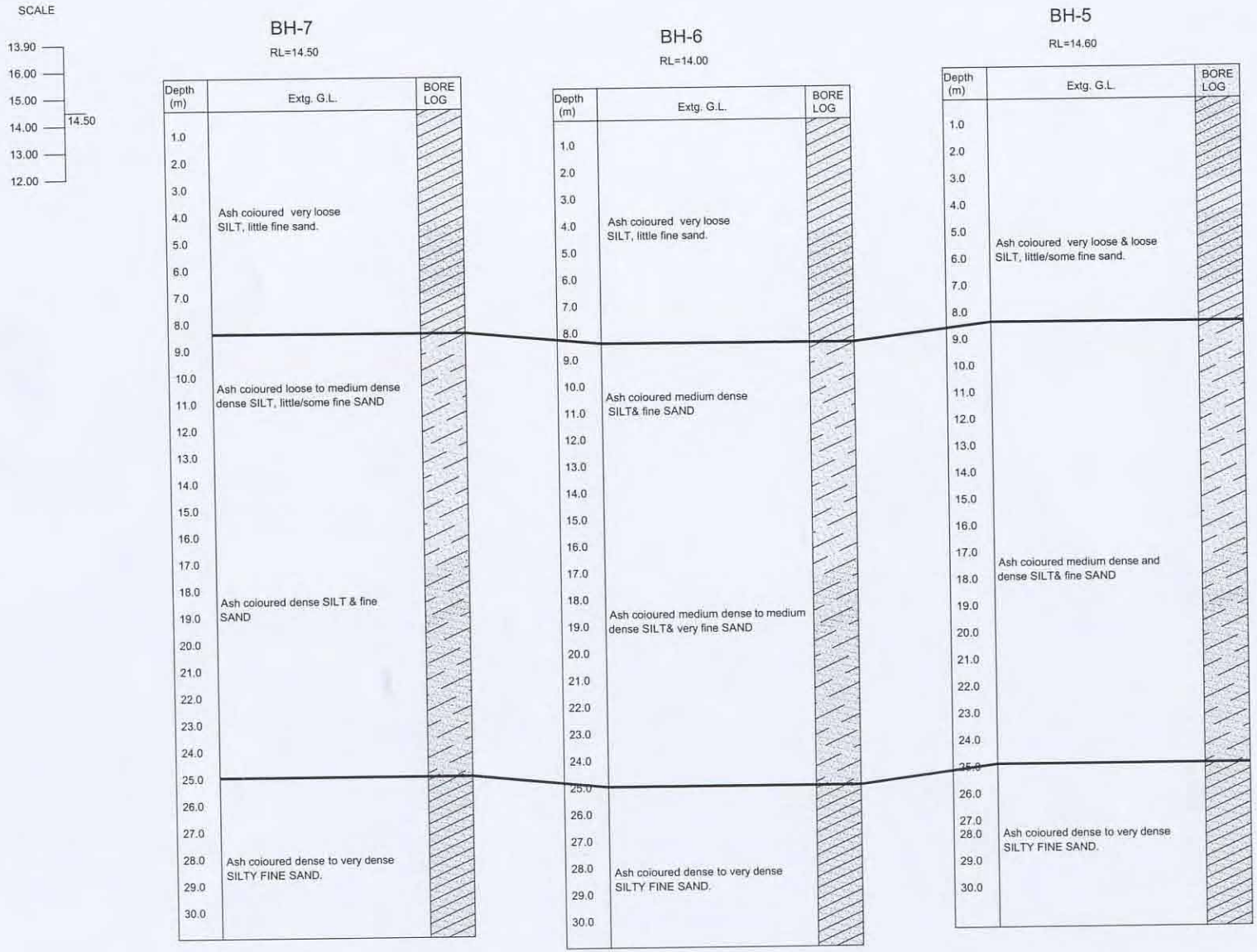
LONGITUDINAL CROSS SECTION-1, OF BH # 3,2&1



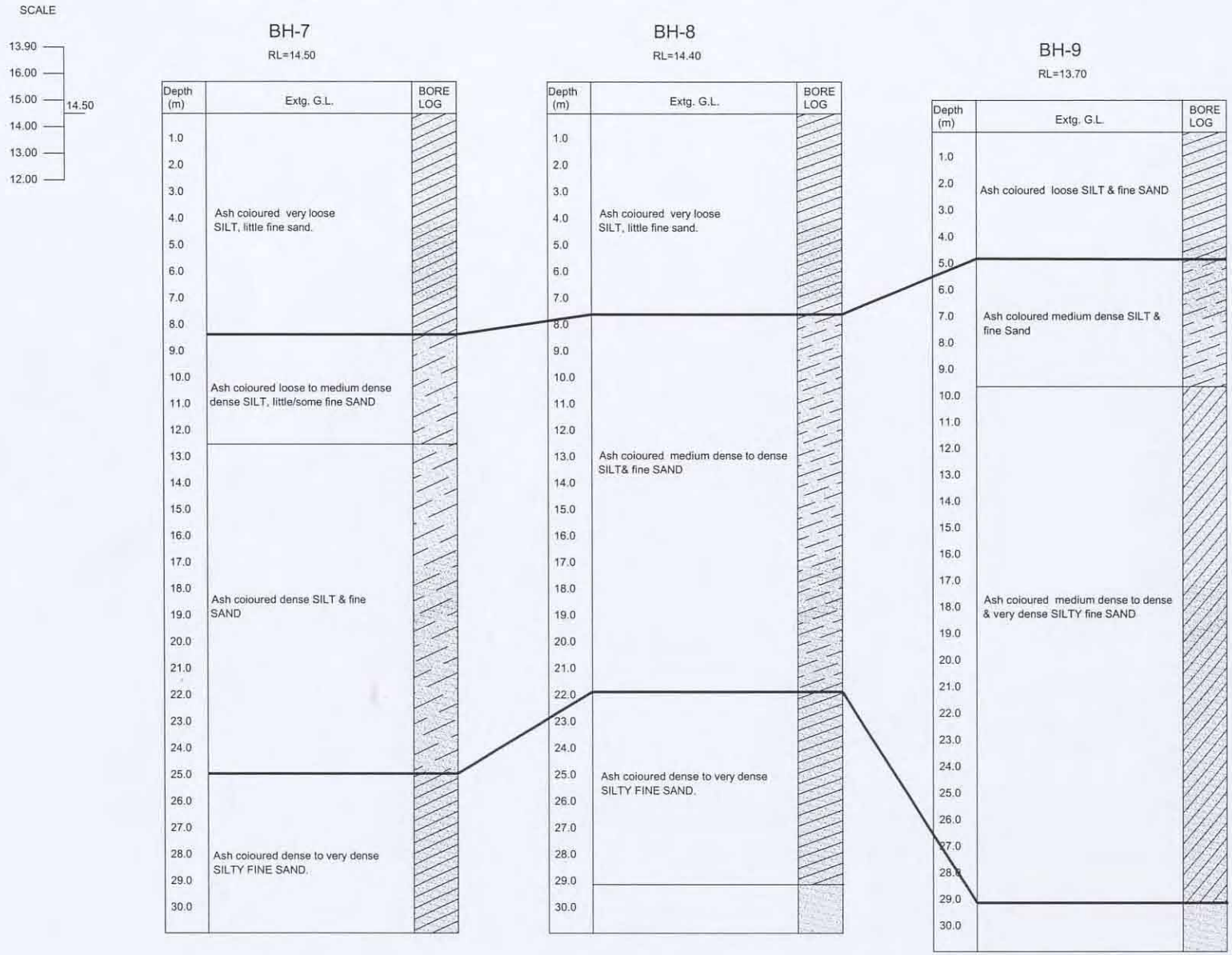
LONGITUDINAL CROSS SECTION -2, OF BH # 2,3&4



LONGITUDINAL CROSS SECTION -3, OF BH # 7,6&5



LONGITUDINAL CROSS SECTION -4, OF BH # 7,8&9



SUMMARY SHEET FOR TEST RESULT

ENGINEERS ASSOCIATES LIMITED	SUMMARY SHEET FOR TEST RESULT	Project : 450 M.W. Combined Cycle Power Station
		Clients : Tokyo Electric Power Services Co, Ltd.
		Location : Bheramara, Kustia. Bangladesh.

BORING NO.	SAMPLE	Sample Depth (M)	Moisture Content (%)	Unconfined Compression test		Unit weight (gm/cc)		Grain Size Analysis			Specific Gravity Test	Direct Shear test		Consolidation Test		Atterberg Limit Test		
				q_u (kg/cm^2	Strain (%)	γ wet	γ dry	Sand (%)	Silt (%)	CLAY (%)		Cohesion (Kg/cm^2)	Angle in degree	Cc	Void ratio	Liquid limit	Plastic Index	Plasticity Index
BH-1	D-2	2.0	21					23.0	77.0	00.0	2.634							
	D-4	4.0						47.0	53.0	0.00	2.62							
	D-10	10.0										0.00	25.0					
	D-20	20.0						68.0	32.0	0.00	2.60							
	D-24	24.0										0.00	44.0					
BH-2	D-1	1.0	18															
	D-6	6.0						45.0	55.0	0.00	2.62	0.05	22.0					
	D-17	17.0						26.0	74.0	0.00	2.63							
	D-21	21.0										0.0	40.0					
	D-28	28.0						70.0	30.0	0.00	2.60							
BH-3	D-3	3.0	15					20.0	80.0	0.00	2.63							
	D-8	8.0										0.00	42.0					
	D-16	16.0						52.0	48.0	00.0	2.62							
	D-22	22.0						72.0	28.0	0.00	2.60							
	D-25	25.0										0.00	44.0					
BH-4	D-3	3.0	18					24.0	76.0	0.00	2.63							
	D-11	11.0										0.05	27.0					
	D-19	19.0						48.0	52.0	0.00	2.62							
	D-23	23.0										0.00	43.0					
	D-26	26.0						74.0	26.0	0.00	2.60							

ENGINEERS ASSOCIATES LIMITED	SUMMARY SHEET FOR TEST RESULT	Project : 450 M.W. Combined Cycle Power Station
		Clients : Tokyo Electric Power Services Co, Ltd.
		Location : Bheramara, Kustia. Bangladesh.

BORING NO.	SAMPLE	Sample Depth (M)	Moisture Content (%)	Unconfined Compression test		Unit weight (gm/cc)		Grain Size Analysis			Specific Gravity Test	Direct Shear test		Consolidation Test		Atterberg Limit Test		
				q_u (kg/cm^2	Strain (%)	γ wet	γ dry	Sand (%)	Silt (%)	CLAY (%)		Cohesion (Kg/cm^2)	Angle in degree	Cc	Void ratio	Liquid limit	Plastic Index	Plasticity Index
BH-5	D-2	2.0	12					20.0	80.0	0.00	2.642							
	D-6	6.0						15.0	85.0	0.00	2.64							
	D-13	13.0										0.00	32.0					
	D-19	19.0						49.0	51.0	0.00	2.62							
	D-25	25.0										0.00	34.0					
BH-6	D-5	5.0	17					17.0	83.0	0.00	2.64							
	D-12	12.0										0.00	33.0					
	D-15	15.0						45.0	55.0	0.00	2.62							
	D-25	25.0						68.0	32.0	0.00	2.61							
	D-27	27.0										0.00	38.0					
BH-7	D-2	2.0	20															
	D-7	7.0						14.0	86.0	0.00	2.64							
	D-10	10.0										0.20	17.0					
	D-14	14.0						47.0	53.0	0.00	2.62							
	D-23	23.0										0.0	35.0					
	D-25	25.0						71.0	29.0	0.00	2.60							
BH-8	D-2	2.00	9															
	D-7	7.00						28.0	72.0	00.0	2.632							
	D-9	9.00						43.0	57.0	00.0	2.62							
	D-17	17.0										0.00	24.0					
	D-23	23.0						70.0	30.0	00.0	2.60							
	D-27	27.0										0.00	45.0					

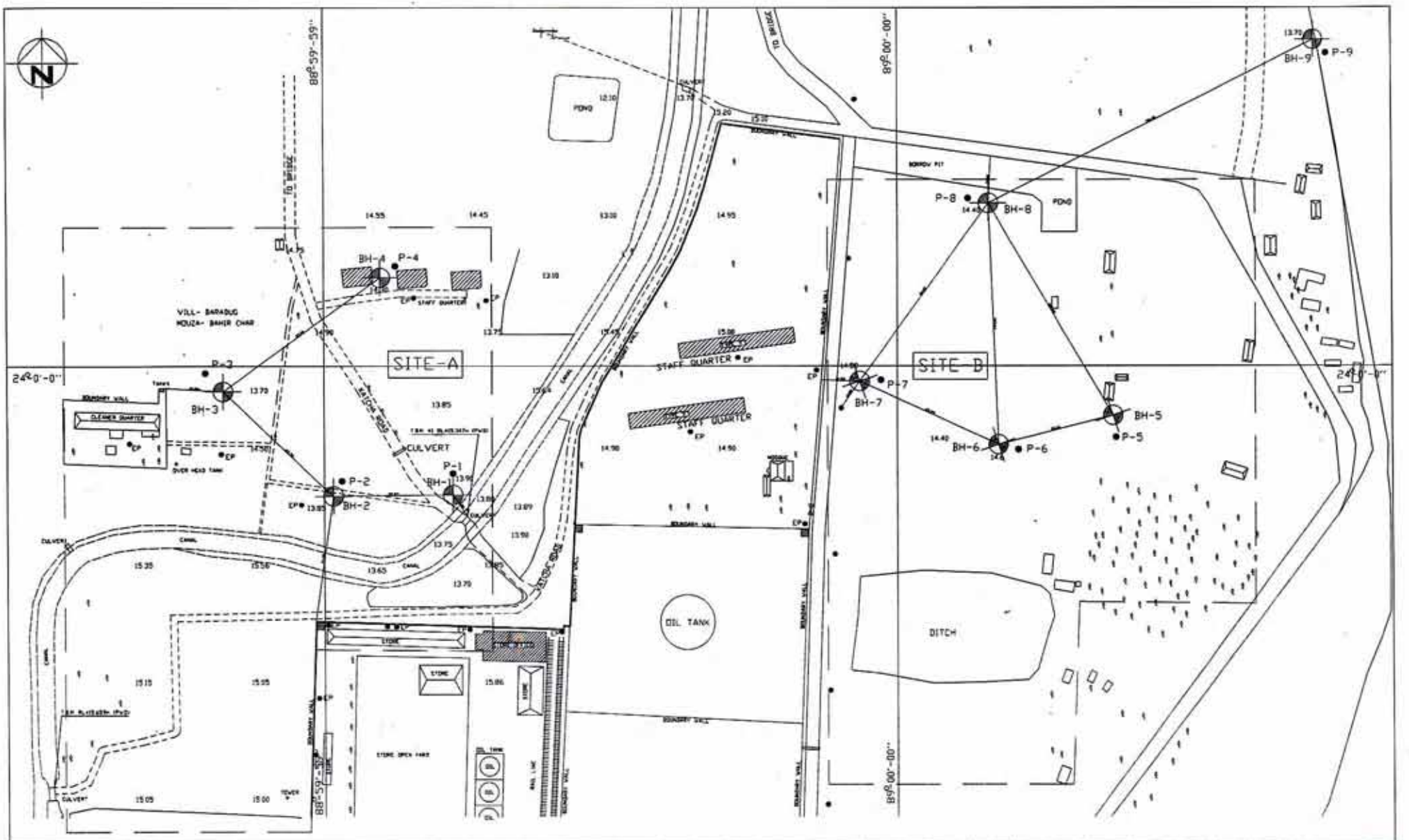
ENGINEERS ASSOCIATES LIMITED	**SUMMARY SHEET FOR TEST RESULT**	**Project : 450 M.W. Combined Cycle Power Station** **Clients : Tokyo Electric Power Services Co, Ltd.** **Location : Bheramara, Kustia. Bangladesh.**

BORING NO.	SAMPLE	Sample Depth (M)	Moisture Content (%)	Unconfined Compression test		Unit weight (gm/cc)		Grain Size Analysis			Specific Gravity Test	Direct Shear test		Consolidation Test		Atterberg Limit Test		
				q_u (kg/cm^2	Strain (%)	γ wet	γ dry	Sand (%)	Silt (%)	CLAY (%)		Cohesion (Kg/cm^2)	Angle in degree	Cc	Void ratio	Liquid limit	Plastic Index	Plasticity Index
BH-9	D-3	3.00	14															
	D-9	9.00						30.0	70.0	0.00	2.63							
	D-13	13.0										0.00	35.0					
	D-20	20.0						66.0	34.0	0.00	2.61							
	D-26	26.0										0.00	42.0					

ANNEX – 1 :
BORE HOLE LOCATION MAP

ANNEX-1

BOREHOLE LOCATION MAP



LOCATION OF BOR E HOLE
P= Pit Sample for Permeability test

PROJECT : PROPOSED 450 MW COMBINED CYCLE POWER STATION, BHERAMARA

DATE : 23-07-2008

PHOTOGRAPHS

Photograph of SPT Sample of Bore Hole – 01 in field

Photograph of SPT Sample of Bore Hole – 02 in field

Photograph of SPT Sample of Bore Hole – 03 in field

Photograph of SPT Sample of Bore Hole – 04 in field

Photograph of field Boring and
SPT Sample of Bore Hole – 05 in field

Photograph of field Boring and
SPT Sample of Bore Hole – 06 in field

Photograph of SPT Sample of Bore Hole – 06 in field

Photograph of SPT Sample of Bore Hole – 07 in field

Photograph of field Boring of Bore Hole – 07 in field

Photograph of field Boring and
SPT Sample of Bore Hole – 08 in field

Photograph of field Boring of Bore Hole – 08 in field

Photograph of field Boring of Bore Hole – 09 in field