SOIL TEST REPORT

AT

TANKS T-6152,

T-6153 & T-6154

5. BEARING CAPACITY OF SOIL

Formula used for computation

Square footing

For Cohesive :

$Qult = CN_cS_c + \gamma D_f N_q + 0.5\gamma BN\gamma S\gamma$

(Ref:Foundation Analysis and Design by J.E. Bowles)

qallowable = qult/F.S (F.S =3)

Mat Foundation
For Cohesive soil :

Qult = 5.14 Su (1 + s'c + d'c - I'c- b'c - g'c) + q

(Ref:Foundation Analysis and Design by J.E. Bowles)

Where, Su = qu/2

q = γD_f

s'c + d'c - I'c- b'c - g'c = Bearing Capacity Factors

Hole No.	Depth below the existing ground level in metre	N field (avg)	*qu in Kn/m²	Net allowable bearing capacity of soil in Kn/m² (F.S used 3)	
				Square footing	Mat foundation
1	1.50	5	59.84	73.91	66.65
	2.00	4	47.88	59.13	53.32
	2.50	4	47.88	59.13	53.32
	3.00	4	47.88	59.13	53.32
	3.50	1	11.97	14.78	13.33
	4.00	1	11.97	14.78	13.33
	4.50	1	11.97	14.78	13.33
2	1.50	4	47.88	59.13	53.32
	2.00	4	47.88	59.13	53.32
	2.50	4	47.88	59.13	53.32
	3.00	4	47.88	59.13	53.32
	3.50	1	11.97	14.78	13.33
	4.00	1	11.97	14.78	13.33
	4.50	1	11.97	14.78	13.33
3	1.50	4	47.88	59.13	53.32
	2.00	3	35.91	44.34	39.99
	2.50	3	35.91	44.34	39.99
	3.00	3	35.91	44.34	39.99
	3.50	2	23.94	29.56	26.66
	4.00	2	23.94	29.56	26.66
	4.50	2	23.94	29.56	26.66
4	1.50	2	23.94	29.56	26.66
	2.00	2	23.94	29.56	26.66
	2.50	2	23.94	29.56	26.66
	3.00	2	23.94	29.56	26.66
	3.50	1	11.97	14.78	13.33
	4.00	1	11.97	14.78	13.33
	4.50	1	11.97	14.78	13.33

* qu = Unconfined compressive strength of soil

Eastern Refinery Limited ★ Chattogram ★

SOIL & FOUNDATION ENGINEERS

Hole No.	Depth below the existing ground level in metre	N field (avg)	*qu in Kn/m²	Net allowable bearing capacity of soil in Kn/m² (F.S used 3)	
				Square footing	Mat foundation
5	1.50	4	47.88	59.13	53.32
	2.00	1	11.97	14.78	13.33
	2.50	1	11.97	14.78	13.33
	3.00	1	11.97	14.78	13.33
	3.50	1	11.97	14.78	13.33
	4.00	1	11.97	14.78	13.33
	4.50	1	11.97	14.78	13.33
6	1.50	2	23.94	29.56	26.66
	2.00	2	23.94	29.56	26.66
	2.50	2	23.94	29.56	26.66
	3.00	2	23.94	29.56	26.66
	3.50	1	11.97	14.78	13.33
	4.00	1	11.97	14.78	13.33
	4.50	1	11.97	14.78	13.33
7	1.50	3	35.91	44.34	39.99
	2.00	2	23.94	29.56	26.66
	2.50	2	23.94	29.56	26.66
	3.00	2	23.94	29.56	26.66
	3.50	1	11.97	14.78	13.33
	4.00	1	11.97	14.78	13.33
	4.50	1	11.97	14.78	13.33
8	1.50	4	47.88	59.13	53.32
	2.00	3	35.91	44.34	39.99
	2.50	3	35.91	44.34	39.99
	3.00	3	35.91	44.34	39.99
	3.50	1	11.97	14.78	13.33
	4.00	1	11.97	14.78	13.33
	4.50	1	11.97	14.78	13.33
9	1.50	3	35.91	44.34	39.99
	2.00	2	23.94	29.56	26.66
	2.50	2	23.94	29.56	26.66
	3.00	2	23.94	29.56	26.66
	3.50	1	11.97	14.78	13.33
	4.00	1	11.97	14.78	13.33
	4.50	1	11.97	14.78	13.33
10	1.50	5	59.84	73.91	66.65
	2.00	3	35.91	44.34	39.99
	2.50	3	35.91	44.34	39.99
	3.00	3	35.91	44.34	39.99
	3.50	2	23.94	29.56	26.66
	4.00	2	23.94	29.56	26.66
	4.50	2	23.94	29.56	26.66

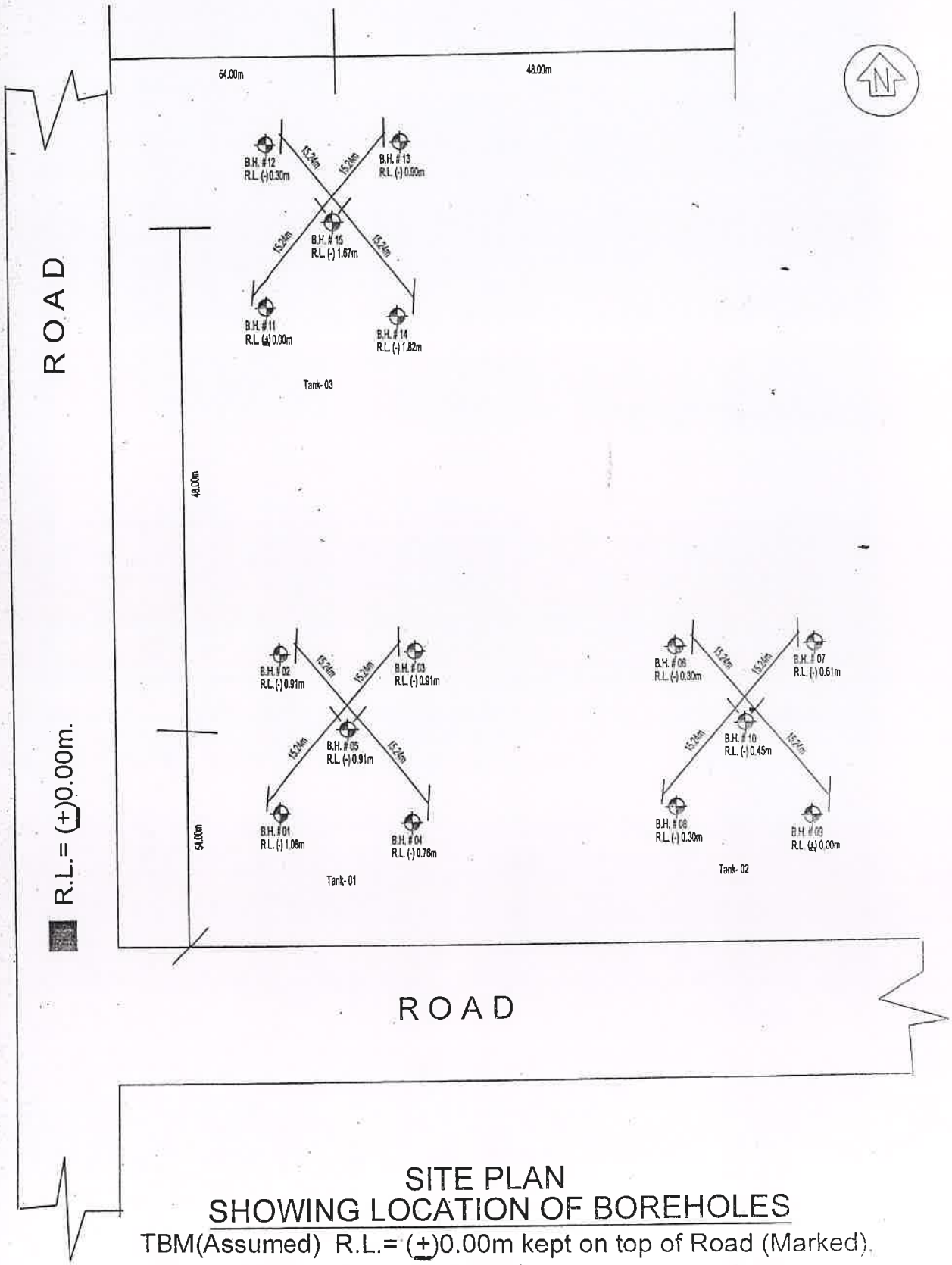
* qu = Unconfined compressive strength of soil

Eastern Refinery Limited ★ Chattogram ★

Hole No.	Depth below the existing ground level in metre	N field (avg)	*qu in Kn/m²	Net allowable bearing capacity of soil in Kn/m² (F.S used 3)	
				Square footing	Mat foundation
11	1.50	4	47.88	59.13	53.32
	2.00	4	47.88	59.13	53.32
	2.50	5	59.84	73.91	66.65
	3.00	5	59.84	73.91	66.65
	3.50	2	23.94	29.56	26.66
	4.00	2	23.94	29.56	26.66
	4.50	2	23.94	29.56	26.66
12	1.50	4	47.88	59.13	53.32
	2.00	1	11.97	14.78	13.33
	2.50	1	11.97	14.78	13.33
	3.00	1	11.97	14.78	13.33
	3.50	1	11.97	14.78	13.33
	4.00	1	11.97	14.78	13.33
	4.50	1	11.97	14.78	13.33
13	1.50	3	35.91	44.34	39.99
	2.00	3	35.91	44.34	39.99
	2.50	4	47.88	59.13	53.32
	3.00	4	47.88	59.13	53.32
	3.50	2	23.94	29.56	26.66
	4.00	2	23.94	29.56	26.66
	4.50	2	23.94	29.56	26.66
14	1.50	4	47.88	59.13	53.32
	2.00	3	35.91	44.34	39.99
	2.50	3	35.91	44.34	39.99
	3.00	3	35.91	44.34	39.99
	3.50	2	23.94	29.56	26.66
	4.00	1	11.97	14.78	13.33
	4.50	1	11.97	14.78	13.33
15	1.50	2	23.94	29.56	26.66
	2.00	2	23.94	29.56	26.66
	2.50	2	23.94	29.56	26.66
	3.00	2	23.94	29.56	26.66
	3.50	1	11.97	14.78	13.33
	4.50	1	11.97	14.78	13.33

* qu = Unconfined compressive strength of soil

Eastern Refinery Limited ★ Chattogram ★



SITE PLAN
SHOWING LOCATION OF BOREHOLES

TBM(Assumed) R.L.= (±)0.00m kept on top of Road (Marked).

Not to scale

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

Eastern Refinery Limited ★ Chattogram ★

SOIL & FOUNDATION ENGINEERS Drawn By :S. Alam Checked. By : Drg. NO :

BORE LOGS

SHEET 1 OF 1

LOG FOR BORE HOLE NO. # 01

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong..

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 04/02/2011

DEPTH (m)	CLASSICAFICATION OF SOIL	LOG	R.L (-) 1.06 (m)	STANDARD PENETRATION TEST RESULT (N-VALUES)	G.W.T	SAMPLNG
0	Lt. Grey to Grey SILT, some clay			0 10 20 30 40 50		D-1
				5		UD-1
				4		D-2
				1		D-3
3.0				1		D-4
				2		D-5
(3.5m)				4		UD-2
						D-6
6.0				3		D-7
				4		D-8
				6		D-9
	Gray FINE SAND trace silt & mica			17		D-10
15.0				21		D-11
(6.0m)				27		D-12
				30		D-13
20.0	Gray SILT, some clay, trace fine sand			13		D-14
(6.0m)				14		D-15
				17		D-16
25.0				13		D-17
				31		D-18
(4.5m)	Gray FINE SAND trace silt & mica			38		D-19
30.0				51		D-20

End of the bore hole

SUMMARY OF LABORATORY TEST RESULTS

SAMPLNG	G_S	W (%)	ATT.LIMITS L_w	ATT.LIMITS P_w	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S. DISTRIBUTION CLAY (%)	G.S. DISTRIBUTION SILT (%)	G.S. DISTRIBUTION SAND (%)	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/c Kg/cm²	SHEAR CHARACTERISTICS (%) ∅	CONSOLIDATION CHARACTERISTICS e_o	CONSOLIDATION CHARACTERISTICS C_c	CONSOLIDATION CHARACTERISTICS P_c
D-1															
UD-1	2.68	30.5	58	26	1.79	1.37	32	66	2	UC	0.61	20.0	.956	.235	
D-2															
D-3															
D-4															
D-5															
UD-2	2.68	38.5	57	25	1.67	1.21				UC	0.38	20.0			
D-6															
D-7	2.676		55	27			27	69	4						
D-8															
D-9															
D-10										DS	.036	30.0			
D-11	2.66	15.5	N	P			-	7	93						
D-12										DS	.028	32.0			
D-13															
D-14															
D-15															
D-16															
D-17															
D-18										DS	.020	32.5			
D-19	2.65	14.2	N	P			-	4	96						
D-20										DS	0.00	36.5			

SOIL & FOUNDATAION ENGINEERS, DHAKA.

DRAWN BY : Eusufzai	CHECKED : M. C. Roy	DATE :	DRG. NO. :

Eastern Refinery Limited ★ Chattogram ★

LOG FOR BORE HOLE NO. # 02

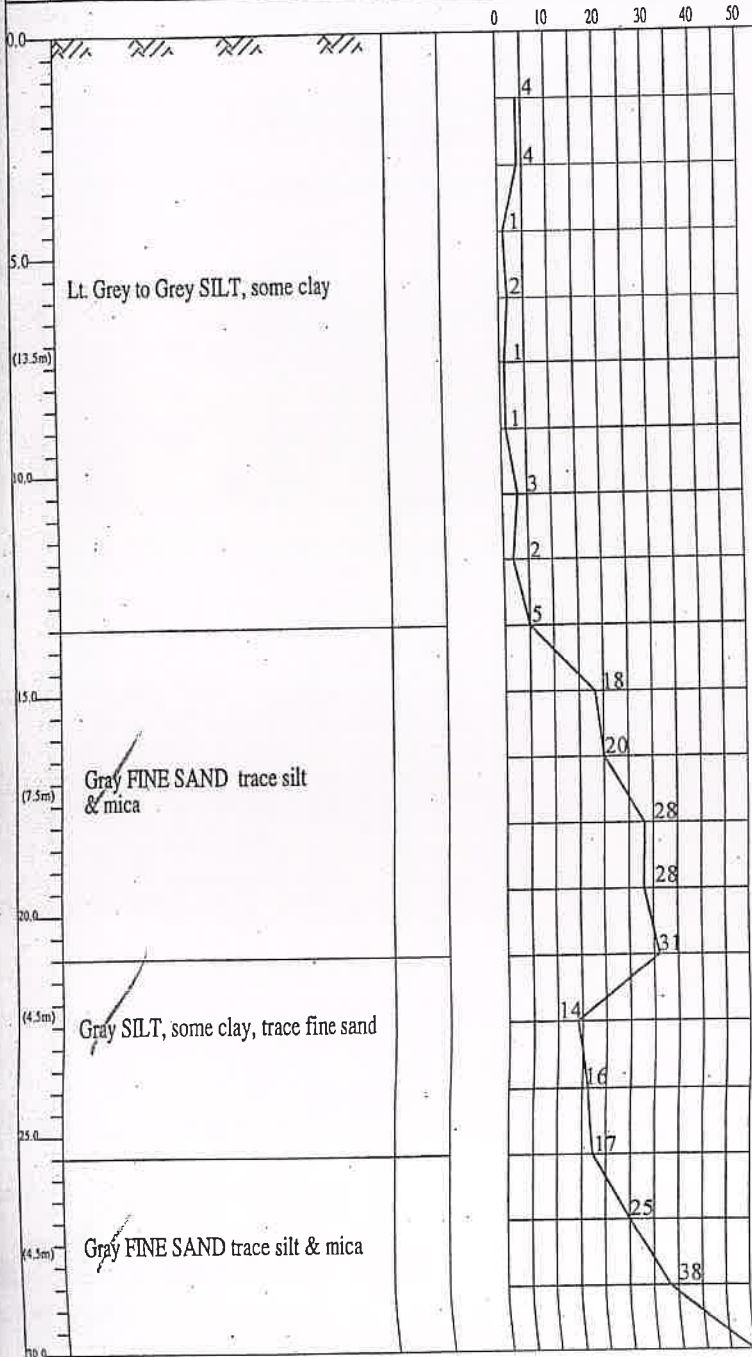
CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 05/02/2011

DEPTH (m)	CLASSICAFICATION OF SOIL	LOG	R.L (-) 0.91 (m)	STANDARD PENETRATION TEST RESULT (N-VALUES)	G.W.T	SAMPLING

SUMMARY OF LABORATORY TEST RESULTS

SAMPLING	G_s	W (%)	ATT.LIMITS L_w	ATT.LIMITS P_w	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S.DISTRIBUTION CLAY (%)	G.S.DISTRIBUTION SILT (%)	G.S.DISTRIBUTION SAND (%)	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/c Kg/cm²	SHEAR CHARACTERISTICS (%) ∅	CONSOLIDATION CHARACTERISTICS e_o	CONSOLIDATION CHARACTERISTICS C_c	CONSOLIDATION CHARACTERISTICS P_c
D-1															
UD-1	2.68	34.9	56	26	1.78	1.32	30	67	3	UC	0.49	20.0			
D-2															
UD-2	2.67	33.5	58	27	1.80	1.35				UC	0.45	20.0	1.033	.240	
D-3															
D-4															
D-5															
D-6															
D-7	2.68	31.7	57	25			33	65	2						
D-8															
D-9															
D-10															
D-11										DS	.035	31.5			
D-12	2.66	16.3	N	P			-	4	96						
D-13										DS	.030	32.5			
D-14															
D-15															
D-16	2.68	22.8	55	25			27	68	5						
D-17															
D-18										DS	.030	31.0			
D-19	2.65	13.8	N	P			-	6	94						
D-20										DS	0.00	36.0			



End of the bore hole

SOIL & FOUNDATAION ENGINEERS, DHAKA.

DRAWN BY : Eusufzai	CHECKED : M. C. Roy	DATE :	DRG. NO. :

Eastern Refinery Limited ★ Chattogram ★

LOG FOR BORE HOLE NO. # 03

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 06/02/2011

SUMMARY OF LABORATORY TEST RESULTS

DEPTH (m)	CLASSICAFICATION OF SOIL	LOG	R.L (-) 0.91 (m)	STANDARD PENETRATION TEST RESULT (N-VALUES)	G.W.T	SAMPLNG	G_s -	W (%)	ATT.LIMITS L_w -	ATT.LIMITS P_w -	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S.DISTRIBUTION CLAY (%)	G.S.DISTRIBUTION SILT (%)	G.S.DISTRIBUTION SAND (%)	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/C Kg/cm²	SHEAR CHARACTERISTICS (°) ∅	CONSOLIDATION CHARACTERISTICS e_o -	CONSOLIDATION CHARACTERISTICS C_c -	CONSOLIDATION CHARACTERISTICS P_c
0.0				0 10 20 30 40 50		D-1															
				4		UD-1	2.68	30.9	56	27	1.73	1.32				UC	0.49	20.0	1.063	.315	
				3		D-2															
				2		UD-2	2.67	34.6	57	26	1.76	1.31	31	66	3	DS	0.32	20.0			
				1		D-3															
5.0	Lt. Grey to Grey SILT, some clay			1		D-4															
(13.5m)				2		D-5															
				2		D-6															
10.0				3		D-7	2.68	30.8	54	25			26	69	5						
				4		D-8															
				18		D-9															
15.0				21		D-10											DS	.030	30.5		
	Gray FINE SAND trace silt & mica			28		D-11															
(7.5m)				38		D-12	2.66	16.3	N	P			-	6	94						
20.0				23		D-13											DS	.016	33.5		
				10		D-14															
(4.5m)	Gray SILT, some clay, trace fine sand			15		D-15															
25.0				21		D-16	2.67	24.1	56	27			28	68	4						
				35		D-17															
(4.5m)	Gray FINE SAND trace silt & mica			38		D-18											DS	.018	33.0		
30.0				44		D-19	2.64	13.6	N	P			-	3	97						
						D-20											DS	0.014	35.0		

End of the bore hole

SOIL & FOUNDATAION ENGINEERS, DHAKA.

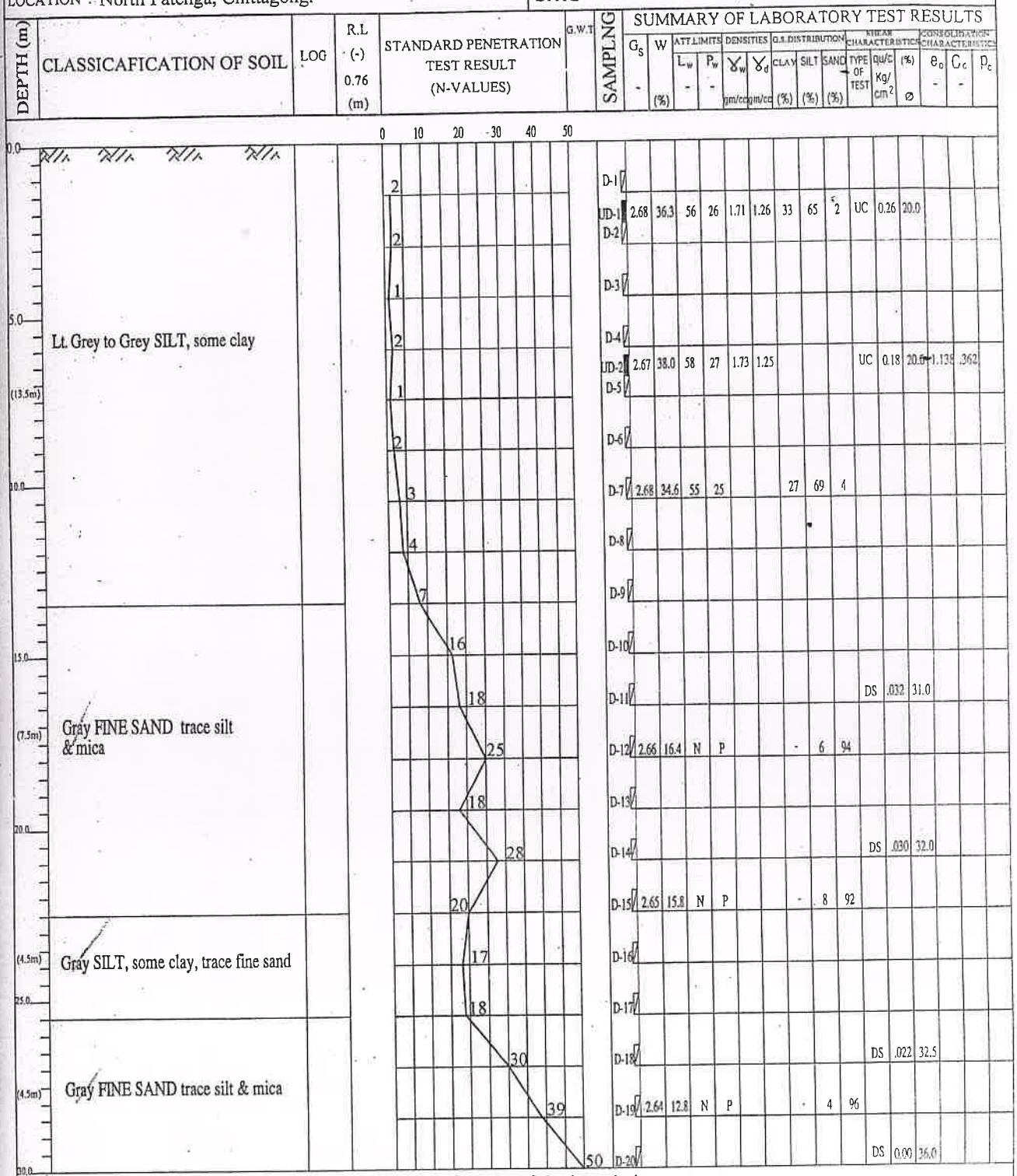
DRAWN BY : Eusufzai	CHECKED : M. C. Rud	DATE :	DRG. NO. :

Eastern Refinery Limited ★ Chattogram ★

LOG FOR BORE HOLE NO. # 04

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 08/02/2011



SUMMARY OF LABORATORY TEST RESULTS

	G_s	W (%)	ATT.LIMITS L_w -	ATT.LIMITS P_w -	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S.DISTRIBUTION CLAY (%)	G.S.DISTRIBUTION SILT (%)	G.S.DISTRIBUTION SAND (%)	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/c Kg/cm²	SHEAR CHARACTERISTICS (%) ∅	CONSOLIDATION CHARACTERISTICS e_o -	CONSOLIDATION CHARACTERISTICS C_c -	CONSOLIDATION CHARACTERISTICS P_c
D-1															
UD-1	2.68	36.3	56	26	1.71	1.26	33	65	2	UC	0.26	20.0			
D-2															
D-3															
D-4															
UD-2	2.67	38.0	58	27	1.73	1.25				UC	0.18	20.0	1.139	.362	
D-5															
D-6															
D-7	2.68	34.6	55	25			27	69	4						
D-8															
D-9															
D-10															
D-11										DS	.032	31.0			
D-12	2.66	16.4	N	P			-	6	94						
D-13															
D-14										DS	.030	32.0			
D-15	2.65	15.8	N	P			-	8	92						
D-16															
D-17															
D-18										DS	.022	32.5			
D-19	2.64	12.8	N	P			-	4	96						
D-20										DS	0.00	36.0			

End of the bore hole

SOIL & FOUNDATAION ENGINEERS, DHAKA.

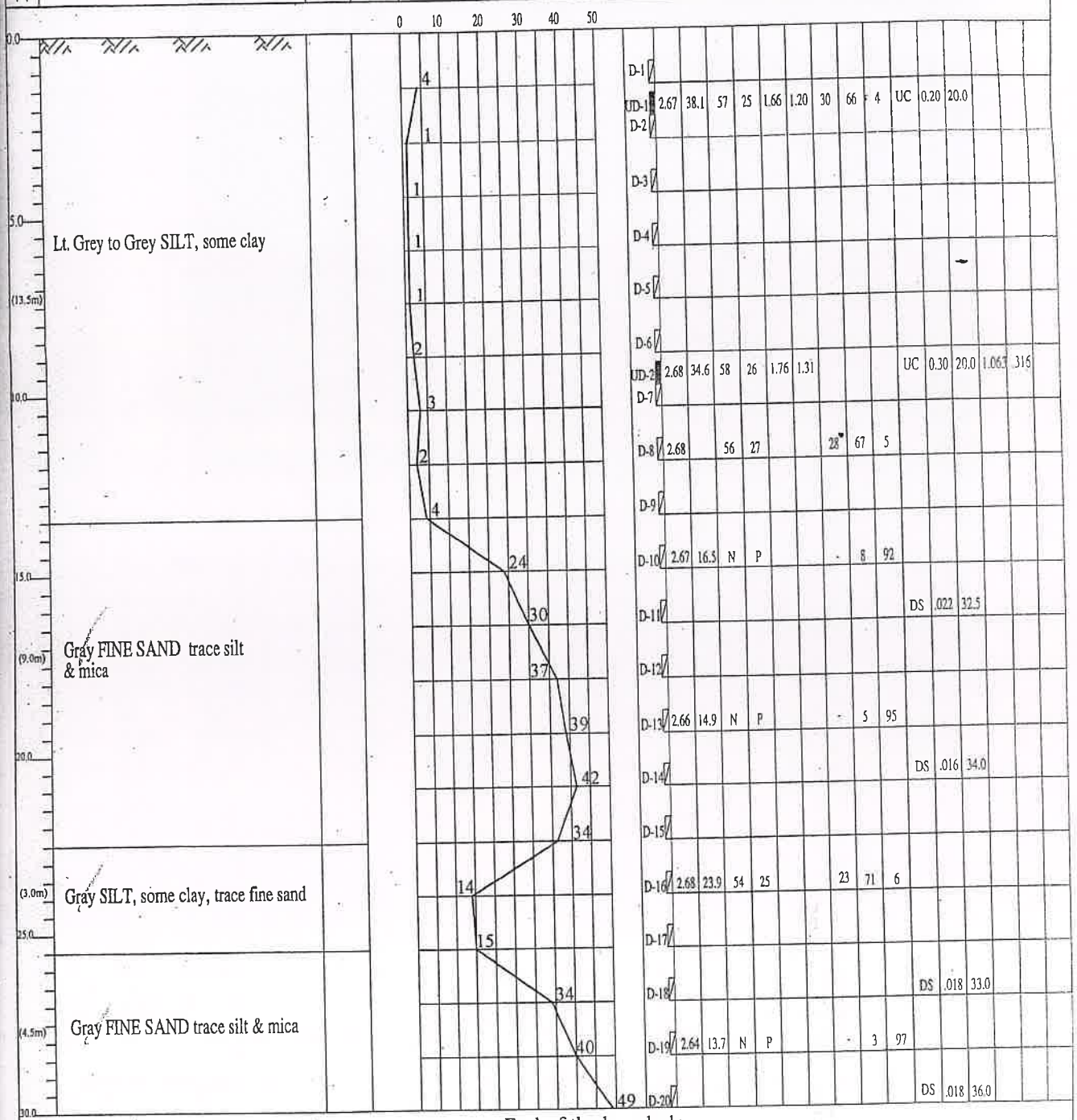
DRAWN BY : Eusufzai	CHECKED : M.C.	DATE :	DRG. NO. :

Eastern Refinery Limited ★ Chattogram ★

LOG FOR BORE HOLE NO. # 05

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 09/02/2011



SUMMARY OF LABORATORY TEST RESULTS

SAMPLNG	G_S	W (%)	ATT. LIMITS L_w	ATT. LIMITS P_w	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S DISTRIBUTION CLAY (%)	G.S DISTRIBUTION SILT (%)	G.S DISTRIBUTION SAND (%)	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/c Kg/cm²	SHEAR CHARACTERISTICS ∅ (%)	CONSOLIDATION CHARACTERISTICS e_o	CONSOLIDATION CHARACTERISTICS C_c	CONSOLIDATION CHARACTERISTICS P_c
D-1															
UD-1	2.67	38.1	57	25	1.66	1.20	30	66	4	UC	0.20	20.0			
D-2															
D-3															
D-4															
D-5															
D-6															
UD-2	2.68	34.6	58	26	1.76	1.31				UC	0.30	20.0	1.067	.316	
D-7															
D-8	2.68		56	27			28	67	5						
D-9															
D-10	2.67	16.5	N	P			-	8	92						
D-11										DS	.022	32.5			
D-12															
D-13	2.66	14.9	N	P			-	5	95						
D-14										DS	.016	34.0			
D-15															
D-16	2.68	23.9	54	25			23	71	6						
D-17															
D-18										DS	.018	33.0			
D-19	2.64	13.7	N	P			-	3	97						
D-20										DS	.018	36.0			

End of the bore hole

SOIL & FOUNDATAION ENGINEERS, DHAKA.

DRAWN BY : Eusufzai	CHECKED : M.C.	DATE :	DRG NO. :

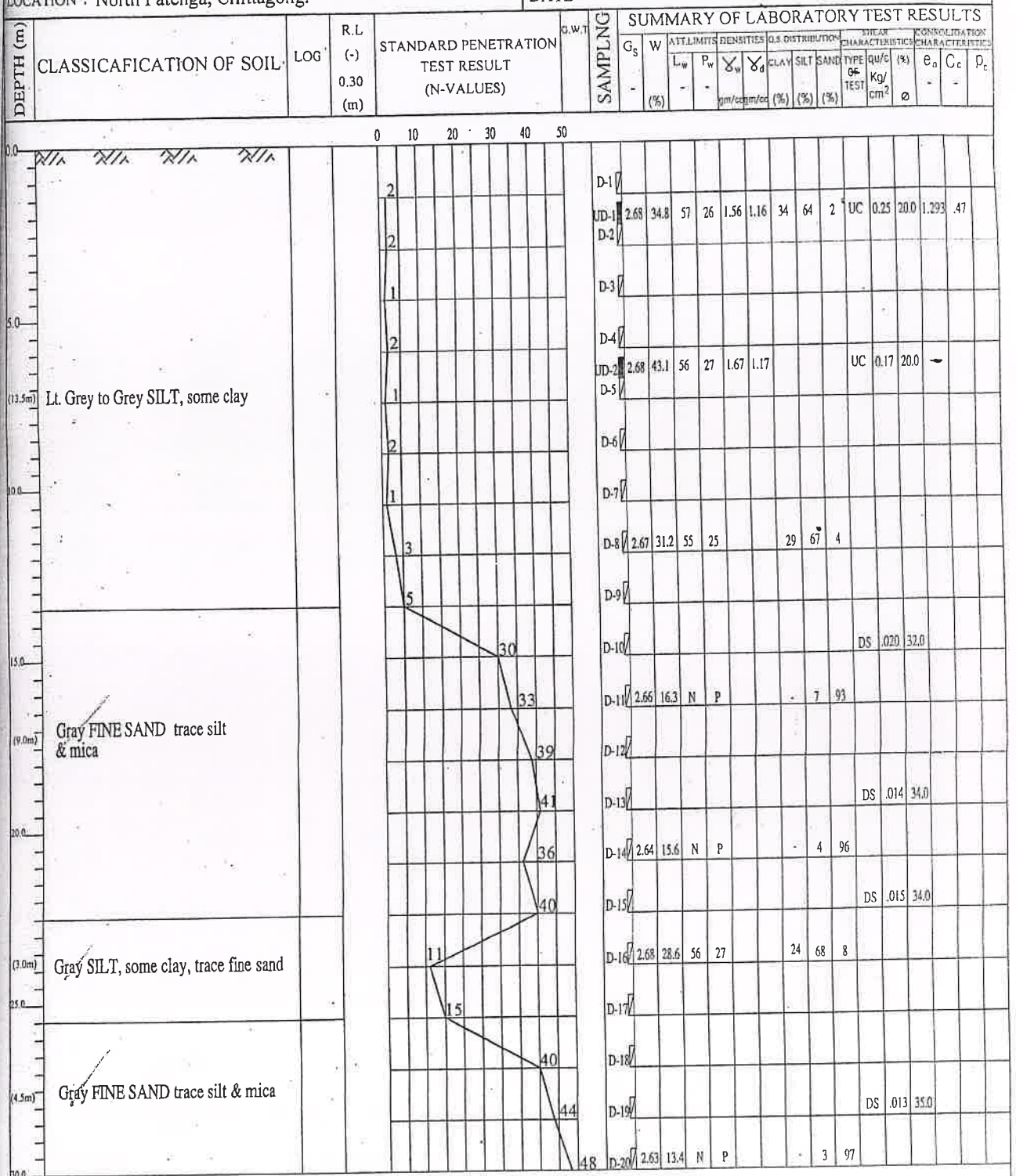
Eastern Refinery Limited ★ Chattogram ★

SHEET 1 OF 1

LOG FOR BORE HOLE NO. # 06

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 10/02/2011



SUMMARY OF LABORATORY TEST RESULTS

SAMPLNG	G_s	W (%)	ATT.LIMITS L_w	ATT.LIMITS P_w	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S. DISTRIBUTION CLAY (%)	G.S. DISTRIBUTION SILT (%)	G.S. DISTRIBUTION SAND (%)	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/c Kg/cm²	SHEAR CHARACTERISTICS ϕ (°)	CONSOLIDATION CHARACTERISTICS e_o	CONSOLIDATION CHARACTERISTICS C_c	CONSOLIDATION CHARACTERISTICS P_c
D-1															
UD-1	2.68	34.8	57	26	1.56	1.16	34	64	2	UC	0.25	20.0	1.293	.47	
D-2															
D-3															
D-4															
UD-2	2.68	43.1	56	27	1.67	1.17				UC	0.17	20.0			
D-5															
D-6															
D-7															
D-8	2.67	31.2	55	25			29	67	4						
D-9															
D-10										DS	.020	32.0			
D-11	2.66	16.3	N	P			-	7	93						
D-12															
D-13										DS	.014	34.0			
D-14	2.64	15.6	N	P			-	4	96						
D-15										DS	.015	34.0			
D-16	2.68	28.6	56	27			24	68	8						
D-17															
D-18															
D-19										DS	.013	35.0			
D-20	2.63	13.4	N	P			-	3	97						

End of the bore hole

SOIL & FOUNDATAION ENGINEERS, DHAKA.

DRAWN BY : Eusufzai	CHECKED : M. C. Rahman	DATE :	DRG. NO. :

Eastern Refinery Limited ★ Chattogram ★

LOG FOR BORE HOLE NO. # 07

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 11/02/2011

DEPTH (m)	CLASSICAFICATION OF SOIL	LOG	R.L (-) 0.61 (m)	STANDARD PENETRATION TEST RESULT (N-VALUES)	G.W.T	SAMPLNG

SUMMARY OF LABORATORY TEST RESULTS

	G_s	W	ATT.LIMITS L_w	ATT.LIMITS P_w	DENSITIES γ_w	DENSITIES γ_d	G.S.DISTRIBUTION CLAY	G.S.DISTRIBUTION SILT	G.S.DISTRIBUTION SAND	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/c Kg/cm²	SHEAR CHARACTERISTICS (%) Ø	CONSOLIDATION CHARACTERISTICS e_o	CONSOLIDATION CHARACTERISTICS C_c	CONSOLIDATION CHARACTERISTICS P_c
	-	(%)	-	-	gm/cc	gm/cc	(%)	(%)	(%)				-	-	
D-1															
UD-1	2.68	36.4	56	25	1.80	1.32	32	65	3	UC	0.32	20.0			
D-2															
D-3															
D-4															
UD-2	2.68	36.0	57	26	1.70	1.25				UC	0.37	20.0	1.176	.380	
D-5															
D-6															
D-7															
D-8	2.67	31.5	58	27			29	67	4						
D-9															
D-10										DS	.022	32.5			
D-11	2.66	14.2	N	P			-	8	92						
D-12										DS	.018	33.0			
D-13	2.64	12.8	N	P			-	5	95						
D-14										DS	.014	34.5			
D-15															
D-16															
D-17	2.68	23.7	54	26			25	69	6						
D-18															
D-19										DS	.016	34.0			
D-20	2.63	13.3	N	P			-	4	96						

0 10 20 30 40 50

0.0
3
2
1
5.0
3
2
(13.5m)
3
10.0
3
4
3
15.0
31
36
(7.5m)
32
38
20.0
41
(4.5m)
43
12
25.0
13
38
(4.5m)
38
30.0
44

Lt. Grey to Grey SILT, some clay

Gray FINE SAND trace silt & mica

Gray SILT, some clay, trace fine sand

Gray FINE SAND trace silt & mica

End of the bore hole

SOIL & FOUNDATAION ENGINEERS, DHAKA.

DRAWN BY : Eusufzai	CHECKED : M. C. Roy	DATE :	DRG. NO. :

Eastern Refinery Limited ★ Chattogram ★

SHEET 1 OF 1

LOG FOR BORE HOLE NO. # 08

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 12/02/2011

DEPTH (m)	CLASSICAFICATION OF SOIL	LOG	R.L (-) 0.30 (m)	STANDARD PENETRATION TEST RESULT (N-VALUES)	G.W.T
0.0				0 10 20 30 40 50	
				4	
				3	
				1	
5.0	Lt. Grey to Grey SILT, some clay			1	
(13.5m)				2	
				1	
10.0				3	
				4	
				6	
15.0				21	
				22	
(9.0m)	Gray FINE SAND trace silt & mica			25	
				28	
20.0				32	
				35	
(3.0m)	Gray SILT, some clay, trace fine sand			14	
25.0				17	
				46	
(4.5m)	Gray FINE SAND trace silt & mica			48	
30.0				49	

End of the bore hole

SUMMARY OF LABORATORY TEST RESULTS

SAMPLNG	G_s	W (%)	ATT.LIMITS L_w	ATT.LIMITS P_w	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S.DISTRIBUTION CLAY (%)	G.S.DISTRIBUTION SILT (%)	G.S.DISTRIBUTION SAND (%)	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/c Kg/cm²	SHEAR CHARACTERISTICS ∅ (%)	CONSOLIDATION CHARACTERISTICS e_o	CONSOLIDATION CHARACTERISTICS C_c	CONSOLIDATION CHARACTERISTICS p_c
D-1															
UD-1	2.68	29.1			1.76	1.37				UC	0.45	20.0	.972	.254	
D-2															
UD-2		34.4	56	27	1.79	1.33	31	66	3	UC	0.38	20.0			
D-3															
D-4															
D-5															
D-6															
D-7															
D-8															
D-9															
D-10	2.65	16.3	N	P			-	10	90						
D-11										DS	.030	30.0			
D-12															
D-13	2.65	15.5	N	P			-	7	93						
D-14										DS	.022	32.0			
D-15															
D-16	2.67	24.2	54	26			24	69	7						
D-17															
D-18										DS	.013	35.0			
D-19															
D-20	2.65	13.8	N	P			-	5	95						

SOIL & FOUNDATAION ENGINEERS, DHAKA.

DRAWN BY : Eusufzai	CHECKED : M. C. Roy	DATE :	DRG. NO. :

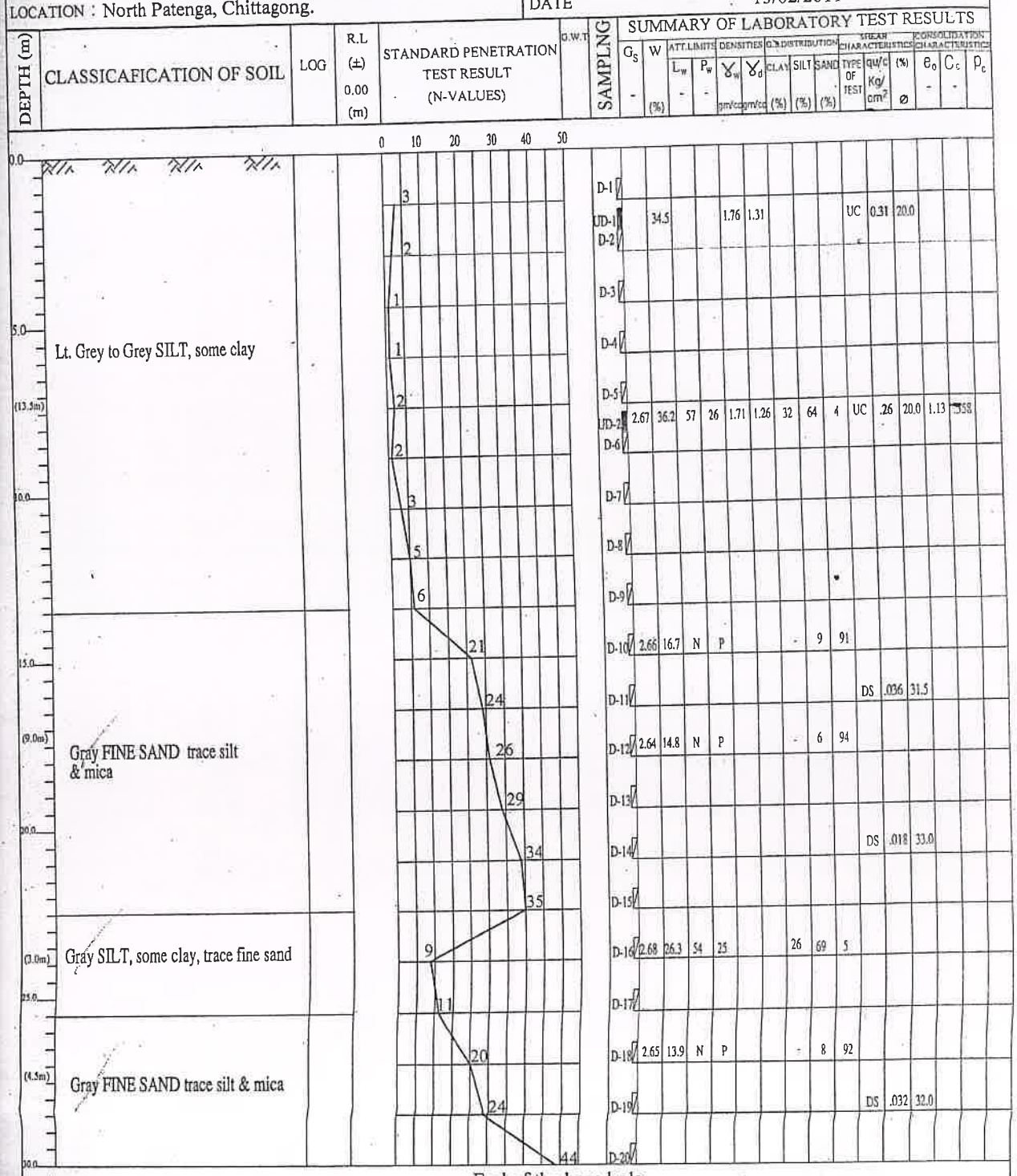
Eastern Refinery Limited ★ Chattogram ★

SHEET 1 OF 1

LOG FOR BORE HOLE NO. # 09

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 13/02/2011



SUMMARY OF LABORATORY TEST RESULTS

SAMPLNG	G_s	W (%)	ATT. LIMITS L_w	ATT. LIMITS P_w	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S. DISTRIBUTION CLAY (%)	G.S. DISTRIBUTION SILT (%)	G.S. DISTRIBUTION SAND (%)	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/c Kg/cm²	SHEAR CHARACTERISTICS ø (%)	CONSOLIDATION CHARACTERISTICS e_o	CONSOLIDATION CHARACTERISTICS C_c	CONSOLIDATION CHARACTERISTICS P_c
D-1															
UD-1		34.5			1.76	1.31				UC	0.31	20.0			
D-2															
D-3															
D-4															
D-5															
UD-2	2.67	36.2	57	26	1.71	1.26	32	64	4	UC	.26	20.0	1.13	.358	
D-6															
D-7															
D-8															
D-9															
D-10	2.66	16.7	N	P			-	9	91						
D-11										DS	.036	31.5			
D-12	2.64	14.8	N	P			-	6	94						
D-13															
D-14										DS	.018	33.0			
D-15															
D-16	2.68	26.3	54	25			26	69	5						
D-17															
D-18	2.65	13.9	N	P			-	8	92						
D-19										DS	.032	32.0			
D-20															

End of the bore hole

SOIL & FOUNDATAION ENGINEERS, DHAKA.

DRAWN BY : Eusufzai	CHECKED : M.C.	DATE :	DRG. NO. :

Eastern Refinery Limited ★ Chittagong ★

LOG FOR BORE HOLE NO. # 10

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 14/02/2011

DEPTH (m)	CLASSICAFICATION OF SOIL	LOG	R.L (-) 0.45 (m)	STANDARD PENETRATION TEST RESULT (N-VALUES)	G.W.T	SAMPLNG	SUMMARY OF LABORATORY TEST RESULTS

SAMPLNG	G_s -	W (%)	ATT.LIMITS L_w -	ATT.LIMITS P_w -	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S.DISTRIBUTION CLAY (%)	G.S.DISTRIBUTION SILT (%)	G.S.DISTRIBUTION SAND (%)	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/c Kg/cm²	SHEAR CHARACTERISTICS (%) ∅	CONSOLIDATION CHARACTERISTIC e_o -	CONSOLIDATION CHARACTERISTIC C_c -	CONSOLIDATION CHARACTERISTIC p_c
D-1															
UD-1	2.68	30.9	56	26	1.73	1.32	32	65	3	UC	0.48	20.0	1.063	.312	
D-2															
UD-2		33.6			1.78	1.33				UC	.40	20.0			
D-3															
D-4															
D-5															
D-6															
D-7															
D-8	2.67	31.3	55	25			28	67	5						
D-9															
D-10															
D-11										DS	.030	32.0			
D-12	2.66	15.4	N	P			-	8	92						
D-13															
D-14										DS	.014	34.0			
D-15															
D-16															
D-17	2.67	25.6	53	26			24	69	7						
D-18															
D-19										DS	.018	33.0			
D-20	2.64	13.8	N	P			-	5	95						

0 10 20 30 40 50

0
5.0 (13.5m)
10.0 (10.0m)
15.0 (3.0m)
20.0 (4.5m)
25.0
30.0

5 3 2 2 1 1 2 3 5 20 28 32 36 39 41 8 10 14 34 45

Lt. Grey to Grey SILT, some clay

Grey FINE SAND trace silt & mica

Grey SILT, some clay, trace fine sand

Grey FINE SAND trace silt & mica

End of the bore hole

SOIL & FOUNDATAION ENGINEERS, DHAKA.

DRAWN BY : Eusufzai	CHECKED :	DATE :	DRG. NO. :

Eastern Refinery Limited ★ Chattogram ★

LOG FOR BORE HOLE NO. # 11

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 15/02/2011

SUMMARY OF LABORATORY TEST RESULTS

DEPTH (m)	CLASSICAFICATION OF SOIL	LOG	R.L (±) 0.00 (m)	STANDARD PENETRATION TEST RESULT (N-VALUES)	G.W.T	SAMPLNG	G_s	W (%)	ATT.LIMITS L_w	ATT.LIMITS P_w	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S.DISTRIBUTION CLAY (%)	G.S.DISTRIBUTION SILT (%)	G.S.DISTRIBUTION SAND (%)	SHEAR CHARACTERISTIC TYPE OF TEST	SHEAR CHARACTERISTIC qu/c Kg/cm²	SHEAR CHARACTERISTIC (%) ø	CONSOLIDATION CHARACTERISTIC e_o -	CONSOLIDATION CHARACTERISTIC C_c -	CONSOLIDATION CHARACTERISTIC P_c
0.0	Lt. Grey to Grey SILT, some clay			0 10 20 30 40 50		D-1															
				4		UD-1		33.2			1.78	1.33				UC	0.56	20.0			
				5		D-2															
				2		UD-2	2.68	28.5	57	25	1.76	1.37	34	64	2	UC	0.51	20.0	.964	.265	
5.0				2		D-3															
				1		D-4															
(13.5m)				1		D-5															
10.0				2		D-6															
				1		D-7															
				2		D-8															
				24		D-9															
15.0				29		D-10	2.66	16.1	N	P			-	9	91						
	Gray FINE SAND trace silt & mica			28		D-11										DS	.028	32.5			
(9.0m)				36		D-12															
				40		D-13	2.65	14.7	N	P			-	6	94						
20.0				37		D-14										DS	.014	34.0			
				12		D-15															
	Gray SILT, some clay, trace fine sand			11		D-16															
(4.5m)				13		D-17	2.68	25.6	55	27				25	69	6					
25.0				38		D-18															
	Gray FINE SAND trace silt & mica			42		D-19	2.65	13.8	N	P						DS	.016	33.5			
(3.0m)						D-20							-	6	94						
30.0																					

End of the bore hole

SOIL & FOUNDATAION ENGINEERS, DHAKA.

DRAWN BY : Eusufzai | CHECKED: M.C.Das | DATE : | DRG. NO. :

Eastern Refinery Limited Chattogram

LOG FOR BORE HOLE NO. # 12

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 13/02/2011

SUMMARY OF LABORATORY TEST RESULTS

DEPTH (m)	CLASSICAFICATION OF SOIL	LOG	R.L (-) 0.30 (m)	STANDARD PENETRATION TEST RESULT (N-VALUES)	G.W.T	SAMPLNG	G_s -	W (%)	ATT.LIMITS L_w -	ATT.LIMITS P_w -	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S.DISTRIBUTION CLAY (%)	G.S.DISTRIBUTION SILT (%)	G.S.DISTRIBUTION SAND (%)	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/c Kg/cm²	SHEAR CHARACTERISTICS ϕ (%)	CONSOLIDATION CHARACTERISTICS e_o -	CONSOLIDATION CHARACTERISTICS C_c -	p_c
0.0				0 10 20 30 40 50		D-1															
				4		UD-1	2.68	25.2			1.77	1.31				UC	0.24	20.0			
				1		D-2															
				1		D-3															
5.0						UD-2	2.67	37.9	56	25	1.71	1.24	31	65	4	UC	0.39	20.0	1.178	.384	
	Lt. Grey to Grey SILT, some clay			1		D-4															
(13.5m)				1		D-5															
				2		D-6															
10.0				3		D-7															
				2		D-8															
				4		D-9															
15.0				24		D-10	2.66	16.5	N	P			-	7	93						
				30		D-11										DS	.030	32.5			
(9.0m)	Gray FINE SAND trace silt & mica			37		D-12															
				39		D-13										DS	.016	34.0			
20.0				42		D-14	2.66	14.9	N	P			-	4	96						
				34		D-15															
(3.0m)	Gray SILT, some clay, trace fine sand			14		D-16															
25.0				15		D-17	2.68	27.6	54	27			25	71	4						
				34		D-18															
(4.5m)	Gray FINE SAND trace silt & mica			40		D-19	2.65	14.2	N	P			-	4	96						
30.0				49		D-20										DS	.014	34.0			

End of the bore hole

SOIL & FOUNDATAION ENGINEERS, DHAKA.

DRAWN BY : Eusufzai	CHECKED : M. C. Roy	DATE :	DRG. NO. :

Eastern Refinery Limited ★ Chattogram ★

LOG FOR BORE HOLE NO. # 13

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong..

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 17/02/2011

DEPTH (m)	CLASSICAFICATION OF SOIL	LOG	R.L (-) 0.90 (m)	STANDARD PENETRATION TEST RESULT (N-VALUES)	G.W.T	SAMPLING

SUMMARY OF LABORATORY TEST RESULTS

SAMPLING	G_s	W (%)	ATT.LIMITS L_w	ATT.LIMITS P_w	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S.DISTRIBUTION CLAY (%)	G.S.DISTRIBUTION SILT (%)	G.S.DISTRIBUTION SAND (%)	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/c Kg/cm²	SHEAR CHARACTERISTICS (%) ∅	CONSOLIDATION CHARACTERISTICS e_o -	CONSOLIDATION CHARACTERISTICS C_c -	CONSOLIDATION CHARACTERISTICS P_c
D-1															
UD-1	2.68	34.5			1.79	1.33				UC	0.38	20.0	1.025	.311	
D-2															
UD-2		30.5	56	27	1.79	1.37	29	67	4	UC	0.52	20.0			
D-3															
D-4															
D-5															
D-6															
D-7															
D-8															
D-9															
D-10			N	P					9	91					
D-11										DS	.032	31.0			
D-12															
D-13			N	P					6	94					
D-14										DS	.018	33.5			
D-15															
D-16															
D-17			52	25			23	70	7						
D-18															
D-19										DS	.036	30.5			
D-20			N	P					4	96					

0 10 20 30 40 50

0.0
3 4 2 1 2 1 2 2 4 18 22 26 31 37 39
5.0
(13.5m) Lt. Grey to Grey SILT, some clay
10.0
15.0
(9.0m) Gray FINE SAND trace silt & mica
20.0
10 13 12 15 30
(4.5m)
25.0
Gray SILT, some clay, trace fine sand
(3.0m)
30.0
Gray FINE SAND trace silt & mica

End of the bore hole

SOIL & FOUNDATAION ENGINEERS, DHAKA.

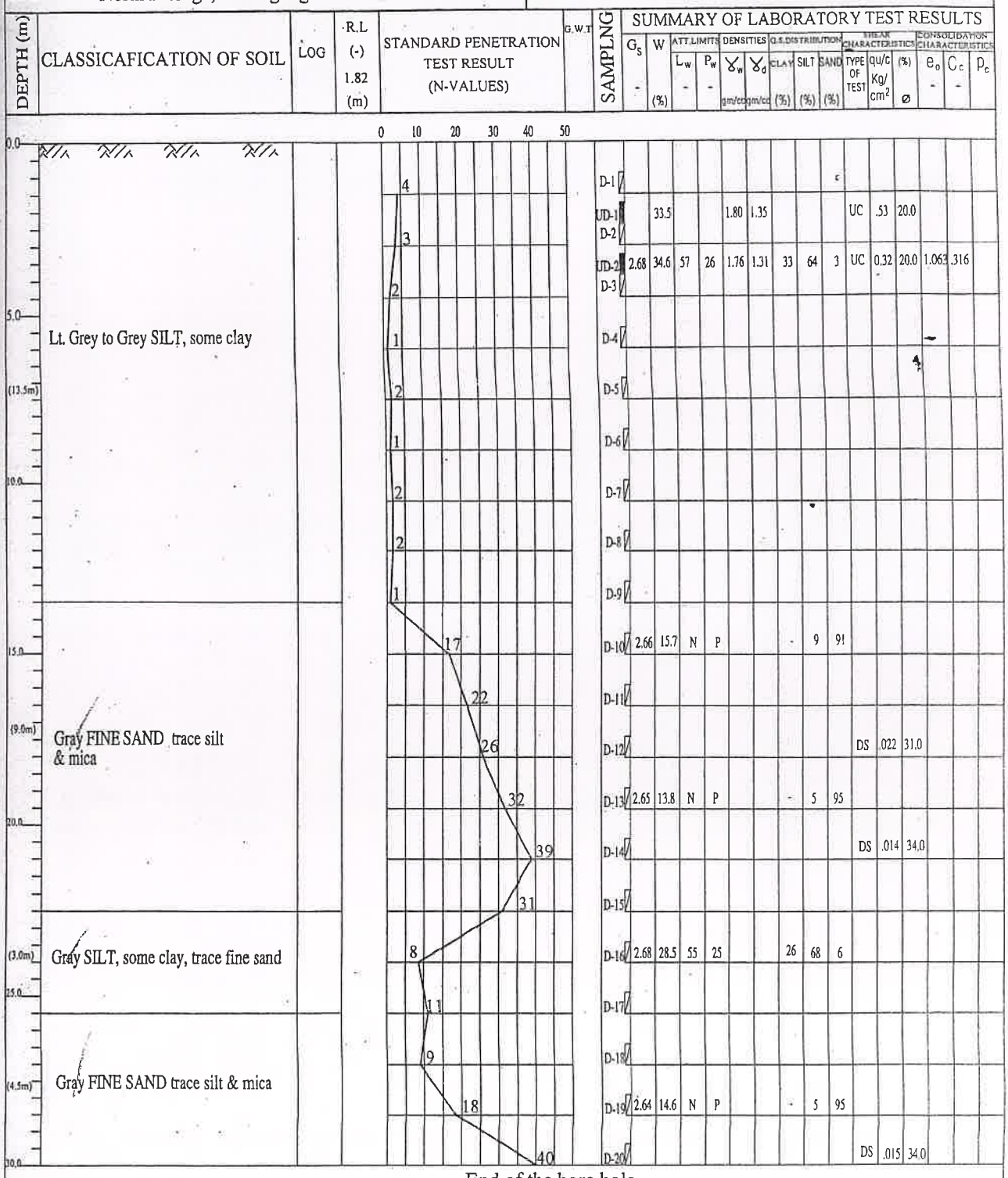
DRAWN BY : Eusufzai	CHECKED : M. C. Ang	DATE :	DRG. NO. :

Eastern Refinery Limited ★ Chattogram ★

LOG FOR BORE HOLE NO. # 14

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 18/02/2011



SUMMARY OF LABORATORY TEST RESULTS

SAMPLNG	G_s	W (%)	ATT. LIMITS L_w	ATT. LIMITS P_w	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S. DISTRIBUTION CLAY (%)	G.S. DISTRIBUTION SILT (%)	G.S. DISTRIBUTION SAND (%)	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/c Kg/cm²	SHEAR CHARACTERISTICS (%) ø	CONSOLIDATION CHARACTERISTICS e_o	CONSOLIDATION CHARACTERISTICS C_c	CONSOLIDATION CHARACTERISTICS P_c
D-1															
UD-1		33.5			1.80	1.35				UC	.53	20.0			
D-2															
UD-2	2.68	34.6	57	26	1.76	1.31	33	64	3	UC	0.32	20.0	1.063	.316	
D-3															
D-4															
D-5															
D-6															
D-7															
D-8															
D-9															
D-10	2.66	15.7	N	P			-	9	91						
D-11															
D-12										DS	.022	31.0			
D-13	2.65	13.8	N	P			-	5	95						
D-14										DS	.014	34.0			
D-15															
D-16	2.68	28.5	55	25			26	68	6						
D-17															
D-18															
D-19	2.64	14.6	N	P			-	5	95						
D-20										DS	.015	34.0			

End of the bore hole

SOIL & FOUNDATAION ENGINEERS, DHAKA.

DRAWN BY : Eusufzai	CHECKED : M. C. Ray	DATE :	DRG. NO. :

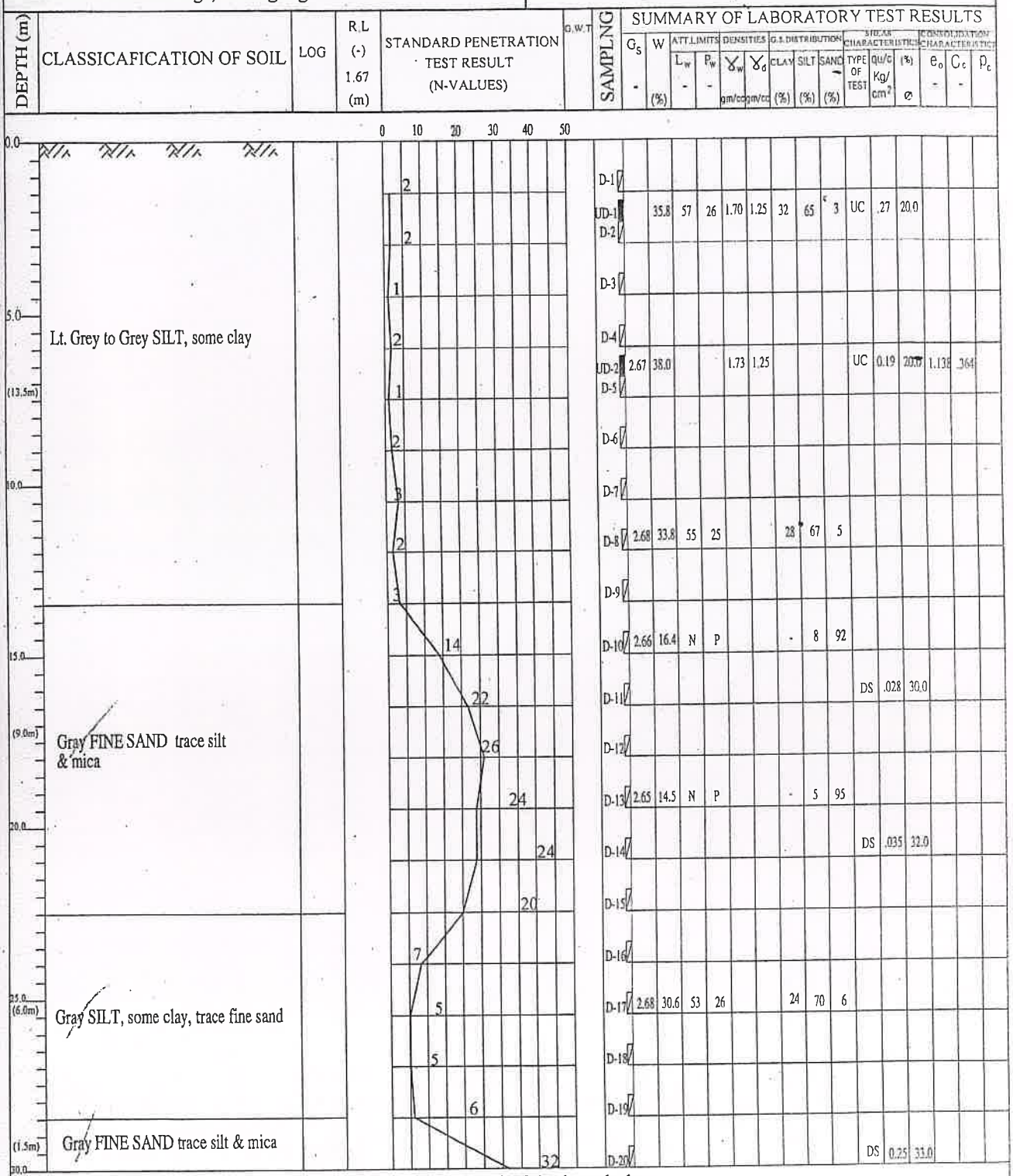
Eastern Refinery Limited ★ Chittagong ★

SHEET 1 OF 1

LOG FOR BORE HOLE NO. # 15

CLIENT : Eastern Refinery Ltd.,
PROJECT : Const. of Petroleum Product Storage Tank
LOCATION : North Patenga, Chittagong.

METHOD OF BORING : Wash
DIAMETER OF BORING : 120mm
DATE : 19/02/2011



SUMMARY OF LABORATORY TEST RESULTS

SAMPLNG	G_s -	W (%)	ATT.LIMITS L_w -	ATT.LIMITS P_w -	DENSITIES γ_w gm/cc	DENSITIES γ_d gm/cc	G.S. DISTRIBUTION CLAY (%)	G.S. DISTRIBUTION SILT (%)	G.S. DISTRIBUTION SAND (%)	SHEAR CHARACTERISTICS TYPE OF TEST	SHEAR CHARACTERISTICS qu/c Kg/cm²	SHEAR CHARACTERISTICS ∅ (°)	CONSOLIDATION CHARACTERISTICS e_o -	CONSOLIDATION CHARACTERISTICS C_c -	CONSOLIDATION CHARACTERISTICS P_c
D-1															
UD-1		35.8	57	26	1.70	1.25	32	65	3	UC	.27	20.0			
D-2															
D-3															
D-4															
UD-2	2.67	38.0			1.73	1.25				UC	0.19	20.0	1.138	.364	
D-5															
D-6															
D-7															
D-8	2.68	33.8	55	25			28	67	5						
D-9															
D-10	2.66	16.4	N	P			-	8	92						
D-11										DS	.028	30.0			
D-12															
D-13	2.65	14.5	N	P			-	5	95						
D-14										DS	.035	32.0			
D-15															
D-16															
D-17	2.68	30.6	53	26			24	70	6						
D-18															
D-19															
D-20										DS	0.25	33.0			

End of the bore hole

SOIL & FOUNDATAION ENGINEERS, DHAKA.

DRAWN BY : Eusufzai	CHECKED :	DATE :	DRG. NO. :

Eastern Refinery Limited ★ Chattogram ★