

Bore Hole : RB - 21	1 of 2	Ground Water Level (GWL):	meter	Date :	24 - 9 - 1997 to 26 - 9 - 1997
Location : LEFT BANK		Coordinate :	x = y =	Dredged by :	Tatang
Boring Depth : 20.00 meter		Angle :	Bearing :	Logged by :	Rudy Mulyanto
Elevation : + 0.610 meter		Drilling Machine :	YSO - 1	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					19				20									
									Standard Penetration Test					13	14	15	16	17	18	Afterberg Limits			Strength Test				
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	GWL	DESCRIPTION	N - Value Number of Blows per 30 Cm Penetration											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (T/m ³)	Void Ratio, e	● Plastic Limit (%)	□ Plastic Index (%)
									0	10	20	30	40	50					0	40	80	120					
24 SEPTEMBER 1997	1							0.00 - 2.45 m: CLAYEY SILT, brown to greyish brown, soft to firm, medium to low plasticity, moist, containing some amount of plant roots.	3/30																		
	2			2.45		ML		2.45 - 5.30 m: SILTY SAND, grey, very fine to medium grained, well graded, loose; containing some mollusca shell and gravels with diameter up to 1.00 cm.	3/30	Ac																	
	3					SW		5.30 - 12.00 m: SILTY CLAY, grey, soft, low to medium plasticity, moist; containing some mollusca shell.	3/30													21	24	45			
	4									7/30																	
	5			5.30					3/30	As	1.637	41.263	1.821	0.870													
	6								3/30																		
	7					CL			6/30		2.577	52.700	1.733	1.227													
	8								6/30																		
	9									3/30		2.730	64.650	1.606	1.636												
	10							0.60																			
	11																										
	12				12.00				12.00 - 16.35 m: SILTY-CLAYEY SAND, grey, very fine to medium grained, poorly graded, loose, moist (in 14.40 m depth getting medium dense and containing gravels with diameter up to 1.00 cm).	2/30	Ac																
	13																										
	14																										
	15																										

LEGEND: CORING S.P.T. V.O.S.



PT. Geo ACE
Jln. Pejajaran no. 123
BANDUNG, INDONESIA

**SOIL MECHANICS SURVEY FOR
THE DETAILED DESIGN OF FLOOD CONTROL,
URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : RB-22	Sheet : 1 of 2	Ground Water Level (GWL) : meter	Date : 25-9-1997 to 27-9-1997
Location : RIGHT BAIK	Coordinate : x* y*	Drilled by : Komardi	
Boring Depth : 20.00 meter	Angle : Bearing :	Logged by : Rudy Muranto	
Elevation : + 1992 meter	Drilling Machine : YSO-1	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12				13	14	15	16	17	18	19			20											
									Standard Penetration Test										Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _m)	Void Ratio, e	Aberberg Limits			Type	Strength Test				
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	G.W.L	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration				Cohesion (kg/cm ²)																				
									0	10	20	30		40	50					0	40	80	120		Angle internal friction (°)								
26 SEPTEMBER 1997				370	CH		2.20	0.00 - 3.70 m: SILTY CLAY, brown to dark brown, firm, medium to high plasticity, moist, containing plant roots.	0	0	0	0	0	0	400	B	2.583	52.440	1.704	1.311	26*	44	472										
								3.70 - 4.55 m: GRAVELY-SANDY SILT, grey, soft to firm, low plasticity, moist, containing gravels with diameter up to 0.50 cm.	4	10	30	10	30	10	30	450	Bo																
								4.55 - 6.20 m: GRAVELY SAND, grey, coarse to very coarse grained, poorly graded, medium dense. GRAVELS, diameter up to 6.00 cm.	5	35	35	35	35	35	35	2100	As	2.735	59.200	1.569	1.579	26*	59	455									
								6.20 - 7.35 m: CLAYEY SAND, grey, very fine to medium grained, poorly graded, loose, moist.	6	3	3	3	3	3	3	300																	
								7.35 - 14.30 m: SILTY CLAY, grey, soft, low plasticity, occasional gravels with diameter up to 0.50 cm.	7	3	3	3	3	3	3	300																	
								14.30 - 16.15 m: SILTY SAND, grey, medium to very coarse grained, very dense, well graded.	14	3	3	3	3	3	3	300	Ac	2.650	51.700	1.751	1.270	22*	247	460									
												14.30	SW		2.20		14.30																
28 SEPTEMBER 1997					CL				8	3	3	3	3	3	300																		
									9	3	3	3	3	3	300																		
									10	3	3	3	3	3	300																		
									11	3	3	3	3	3	300																		
									12	3	3	3	3	3	300																		
									13	3	3	3	3	3	300																		
									14	3	3	3	3	3	300																		
									15	3	3	3	3	3	300																		

LEGEND: [Symbol] COARSE [Symbol] SPT [Symbol] UCS

Bore Hole : RB-22	Sheet : 2 of 2	Ground Water Level (GWL) :	meter	Date :	25-9-1997 to 27-9-1997
Location :	RIGHT BANK	Coordinate :	x = y =	Drilled by :	Komardi
Boring Depth :	20.00 meter	Angle :		Logged by :	Rudy Murtanto
Elevation :	+ 1.992 meter	Drilling Machine :	YSD-1	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1 Date	2 Scale	3 Elevation	4 Stratum Thickness	5 Depth (m)	6 Soil Profile	7 Classification	8 G.W.L.	9 DESCRIPTION	12 Standard Penetration Test											19 Atterberg Limits				20 Strength Test						
									N-Value Number of Blows per 30 Cm Penetration					13 Geological Strata	14 Method of Sampling	15 Specific Gravity	16 Water Content (%)	17 Unit Weight (γ _{mo})	18 Void Ratio, e	● Plastic Limit (%) □ Percent liquid (%) ▲ Liquid Limit (%)				Type	Angle internal friction (°)	Cohesion (kg/cm ²)				
0 10 20 30 40 50					0 40 80 120 160																									
27 SEPTEMBER 1997	15				•••••			14.30 - 16.15 m: SILTY SAND, grey, medium to very coarse grained, very dense, well graded.	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						
	15			16.15	•••••	SW			16.15 - 20.00 m: CLAY, grey, high plasticity, very stiff, moist.	14/00	43/00	29/00	24/00	20/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00
	17				•••••		CH	24/00		24/00	24/00	24/00	24/00	24/00	24/00	24/00	24/00	24/00	24/00	24/00	24/00	24/00	24/00	24/00	24/00	24/00	24/00	24/00	24/00	
	18				•••••			20/00		20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00
	19				•••••			20/00		20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00	20/00
	20				20.00	•••••				2.20	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00
	21					•••••					23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00
	22					•••••					23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00
	23					•••••					23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00
	24					•••••					23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00
	25					•••••					23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00
	26					•••••				23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	
27					•••••			23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00			
28					•••••			23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00			
29					•••••			23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00			
30					•••••			23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00	23/00			

LEGEND: CGANO S.P.T. UDS



PT. Geo ACE
 Jln. Pejajaran no. 125
 BANDUNG, INDONESIA

**SOIL MECHANICS SURVEY FOR
 THE DETAILED DESIGN OF FLOOD CONTROL,
 URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
 IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : RB-23	Sheet : 1 of 1	Ground Water Level (GWL): 6.570 meter	Date : 21-9-1997 to 22-9-1997
Location : LEFT BANK	Coordinate : x* y*	Drilled by : UUS	
Boring Depth : 15.00 meter	Angle : Bearing :	Logged by : Rudy Mulianto	
Elevation : + 2.355 meter	Drilling Machine : YBM-3E	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12							13			19			20																		
									Standard Penetration Test N-Value Number of Blows per 30 Cm Penetration 0 10 20 30 40 50							13 Geological Strata	14 Method of Sampling	15 Specific Gravity	16 Water Content (%)	17 Unit Weight (t/m ³)	18 Void Ratio, e	Atterberg Limits ● Plastic Limit (%) □ Plastic Index (%) ▲ Liquid Limit (%)			Strength Test Type Angle internal friction (°) Cohesion (kN/m ²)															
21 SEPTEMBER 1997				0.55		UL		0.00 - 0.55 m: CLAYEY SILT, brown, stiff to very stiff, firm - soft, low to plasticity, moist to dry, containing some plant roots, some gravels with diameter up to 1.00 cm.	10/30																															
								0.55 - 3.55 m: SILTY CLAY, light brown, firm - stiff, high plasticity, moist.	6/30																															
				3.55						7/30																														
					4.55				3.55 - 4.55 m: SILTY SAND, dark grey, medium to very coarse grained, medium graded, medium dense; with some amount of gravels diameter up to 0.50 cm.	10/30	Ac																													
									4.55 - 11.40 m: SILTY SAND, grey, very fine to fine grained, poorly graded, containing some mollusca shell.	5/30																														
										5/30																														
										11/30																														
										3/30																														
										2/30																														
										6/30																														
										13/30																														
	22 SEPTEMBER 1997				11.40				11.40 - 12.50 m: CLAYEY SILT, greyish brown, low to medium plasticity, hard.	67/30	As																													
				12.50				12.50 - 15.00 m: CLAY, brown, high plasticity, stiff to very stiff.	27/30																															
				15.00					6.57																															
BOTTOM OF HOLE																																								

LEGEND: [Symbol] CORNO [Symbol] SPT [Symbol] ULS

**SOIL MECHANICS SURVEY FOR
 THE DETAILED DESIGN OF FLOOD CONTROL,
 URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
 IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : RB-24	Sheet : 1 of 1	Ground Water Level (GWL):	meter	Date :	11-9-1997 to 12-9-1997
Location : RIGHT BANK		Coordinate :	x = y =	Drilled by :	Ade K/Kosasih
Boring Depth : 15.00 meter		Angle :	Bearing :	Logged by :	Rudy Mulianto
Elevation : + 2.649 meter		Drilling Machine :	YBM-3ES	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12		13	14	15	16	17	18	19			20			
									Standard Penetration Test								Atterberg Limits			Strength Test			
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	G.W.L	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration		Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Undrained Weight (Um3)	Void Ratio, e	● Plastic Limit (%)	□ Plastic Index (%)	▲ Liquid Limit (%)	Type	Angle Internal Friction (°)	Cohesion (kg/cm ²)	
11 SEPTEMBER 1997						ML		0.00 - 1.40 m: CLAYEY SILT, brown, low plasticity, firm, moist.	0		B												
				1.40		CH		1.40 - 3.43 m: SILTY CLAY, brown to greyish brown, medium to high plasticity, firm, moist.	10														
				3.43		SW		3.43 - 5.55 m: SILTY SAND, grey, fine to coarse grained, well graded, medium dense.	20		Ac			2.630	44.810					25	29	27	
				5.55				5.55 - 12.10 m: CLAYEY SAND, grey, very fine grained, poorly graded, medium dense, become plastic if moulded by hand.	30														
									40														
									50														
									60														
									70														
									80														
									90														
									100														
									110														
									12.10														
	12 SEPTEMBER 1997								12.10 - 15.00 m: SAND, grey, medium to coarse grained, well graded, dense, occasionally GRAVELS with diameter up to 0.50 cm.	40		Dc											
										34													
									30														
								15.00		Ds													

BOTTOM OF HOLE

LEGEND: CORAS S.P.T. U.O.S

**SOIL MECHANICS SURVEY FOR
 THE DETAILED DESIGN OF FLOOD CONTROL,
 URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
 IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : RB-25	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 23-9-1997 to 24-9-1997
Location : LEFT BANK	Coordinate : X* Y*	Drilled by : Uus	
Boring Depth : 15.00 meter	Angle : Bearing :	Logged by : Rudy Mukanto	
Elevation : + 3.679 meter	Drilling Machine : YBM-3ES	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					19				20								
									Standard Penetration Test					13	14	15	16	17	18	Atterberg Limits				Strength Test		
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (kN/m ³)	Void Ratio, e	● Plastic Limit (%) □ Plastic Index (%) ▲ Liquid Limit (%)
									0	10	20	30	40	50						0	40	80	120			
				0.45		ML		0.00 - 0.45 m: CLAYEY SILT, brown to dark brown, soft to firm, low plasticity, moist, containing plant roots.																		
				2.00				0.45 - 2.00 m: SILTY SAND, brown, very fine to fine grained, poorly graded, loose to medium dense.																		
				2.80				2.00 - 2.80 m: SANDY SILT, light brown, firm, medium to high plasticity, moist.																		
				5.00				2.80 - 5.00 m: SILTY CLAY, brownish grey, firm to stiff, high plasticity, moist.																		
				6.13				5.00 - 6.13 m: SILTY CLAY, dark brown to black, high plasticity, moist.																		
				6.70				6.13 - 6.70 m: SILTY SAND, grey, medium to coarse grained, loose, well graded, occasionally gravels with diameter up to 0.50 cm.																		
								6.70 - 15.00 m: SILTY CLAY, dark grey to grey, high plasticity, stiff to very stiff, moist.																		
23 SEPTEMBER 1997																										
24 SEPTEMBER 1997				15.00			5.17																			

BOTTOM OF HOLE

LEGEND: COMPACT S.P.T. VOID

**SOIL MECHANICS SURVEY FOR
 THE DETAILED DESIGN OF FLOOD CONTROL,
 URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
 IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : RB-26	Sheet : 1 of 1	Ground Water Level (GWL):	meter	Date :	8-9-1997 to 9-9-1997
Location : RIGHT BANK		Coordinate :	x * y *	Drilled by :	Ade K. Kolesih
Boring Depth : 15.00 meter		Angle :	Bearing :	Logged by :	Rudy Mulyanto
Elevation : + 3.107 meter		Drilling Machine :	YBM-3ES	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19				20																																																																																																			
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _m)	Void Ratio, e	Atterberg Limits				Strength Test																																																																																													
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration					Type	Angle Internal Friction (°)	Cohesion (kg/cm ²)	● Plastic Limit (%) □ Plastic Index (%) ▲ Liquid Limit (%)																																																																																																										
									0	10	20	30	40				50																																																																																																										
8 SEPTEMBER 1997	1	2	3	4	5	6	7	8	0.00 - 3.60 m:	SANDY SILT, light brown to brown, low plasticity, soft to stiff, moist; containing some amount of plant roots.					Ac	As	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																																																																																					
									3.60 - 10.00 m:	CLAY, greyish brown to black, high plasticity, firm to stiff, moist.																													Ac	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																																																										
									10.00 - 15.00 m:	SANDY-SILTY CLAY, grey, high plasticity, firm to stiff, moist.																																																								Ac	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																														
									15.00	15.00	3.60	4.30	4.30	4.30																																																																																4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
									10	11	12	13	14	15																																																																																15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15

BOTTOM OF HOLE

LEGEND: CCR740 SPT UCS

**SOIL MECHANICS SURVEY FOR
 THE DETAILED DESIGN OF FLOOD CONTROL,
 URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
 IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : RB-27	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 27-9-1997 to 28-9-1997
Location : RIGHT BANK	Coordinate : x* y*	Drilled by : Uus Koswara	
Boring Depth : 15.00 meter	Angle : Bearing :	Logged by : Rudy Muranta	
Elevation : + 3.476 meter	Drilling Machine : YBM-3E	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19				20					
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _m)	Void Ratio, e	Atterberg Limits			
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration					Type	Angle Internal friction (°)	Cohesion (kg/cm ²)													
									0	10	20	30	40				50												
27 SEPTEMBER 1997				1.35		ML		0.00 - 1.35 m: SANDY SILT, brown, soft to firm, medium to low plasticity, moist; containing some amount of plant roots, gravels with diameter up to 3.00 cm.	5/30						Ac														
				4.35		SC		1.35 - 4.35 m: SILTY SAND, dark brown, fine to medium grained, poorly graded, dense to very dense; containing some amount of gravels with diameter up to 5.00 cm.	41/30																				
				6.50		CH		4.35 - 6.50 m: SANDY CLAY, greyish brown, high plasticity, very stiff to hard, moist.	54/30																				
				4.05		SW	4.05	6.50 - 10.00 m: CLAYEY SAND, brown, fine to medium grained, medium to well graded, medium dense to dense; having some amount of gravels with diameter up to 1.50 cm.	67/30																				
					10.00				10.00 - 10.55 m: SANDSTONE, greyish brown, medium to very coarse grained, well sorted, high porosity.	35/30																			
					10.55				10.55 - 12.65 m: SAND, brown, fine to very fine grained (in 12.00 m depth become medium to very coarse grained and very dense), poorly graded, dense.	71/30																			
	23 SEPTEMBER 1997				12.65		SP		12.65 - 15.00 m: GRAVELY SAND, brownish grey to dark grey, coarse to very coarse grained, poorly graded, very dense; having gravels with diameter up to 8.00 cm.	102/30																			
									107/30																				
									107/30																				
				15.00		SP	375		50/14																				
									50/14																				
									42/30																				
									87/30																				
									27/30																				
									27/30																				
									50/7																				
									50/13																				
									50/10																				

BOTTOM OF HOLE

LEGEND: CORSG S.P.T. UDS



PT. Geo ACE
Jln. Pajajaran no. 123
BANDUNG, INDONESIA

SOIL MECHANICS SURVEY FOR
THE DETAILED DESIGN OF FLOOD CONTROL,
URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
IN SEMARANG IN THE REPUBLIC OF INDONESIA

BORING LOG

Bore Hole : R3-28	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 15-9-1997
Location : RIGBT BANK	Coordinate : x * y *	Drilled by : Ade K Kosasih	
Boring Depth : 15.00 meter	Angle : Bearing :	Logged by : Rudy Murtanto	
Elevation : + 1.520 meter	Drilling Machine : YBM-3ES	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12						19			20									
									Standard Penetration Test					Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _{mb})	Void Ratio, e	Atterberg Limits			Strength Test				
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration											Type	Angle internal friction (φ°)	Cohesion (kg/cm ²)					
									10	20	30	40	50				0	40	80								
				0.90				0.00 - 0.90 m: GRAVEL, (retaining wall).																			
								0.90 - 6.20 m: SILTY CLAY, greyish brown to reddish brown, high plasticity, stiff to very stiff, moist.																			
								6.20 - 9.80 m: TUFACEOUS-CLAYEY SILT, yellowish brown, low to medium plasticity, stiff to very stiff, moist.																			
								9.80 - 15.00 m: TUFACEOUS SAND, yellowish grey, fine to medium grained, poorly graded, dense, medium cemented (derived from highly weathered of volcanic breccia), containing some amount of GRAVELS with diameter up to 3.00 cm.																			

BOTTOM OF HOLE

LEGEND: [Symbol] CORNS [Symbol] SPK [Symbol] UDS

**SOIL MECHANICS SURVEY FOR
THE DETAILED DESIGN OF FLOOD CONTROL,
URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : RB-29	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 13-9-1997
Location : LEFT BANK	Coordinates : x* y*	Drilled by : Uus K.	
Boring Depth : 15.00 meter	Angle : Bearing :	Logged by : Rudy Murtanto	
Elevation : + 7.217 meter	Drying Machine : YBM-3E	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12				13	14	15	16	17	18	19				20							
									Standard Penetration Test										Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _{mo})	Void Ratio, e	Atterberg Limits				Strength Test	
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration																● Plastic Limit (%)	□ Plastic Index	▲ Liquid Limit (%)	Type	Angle Internal friction (°)	Cohesion (kg/cm ²)
13 SEPTEMBER 1997	1	2.20	2.20	2.20	ML	ML	-	0.00 - 2.20 m: CLAYEY SILT, brown, low to medium plasticity, stiff, moist.	0	12/30	12/30	2.538	42.21	-	-	24	41	55	-	-	-	-	-	-						
								2.20 - 8.00 m: SILTY CLAY, grey with yellowish brown mottled, high plasticity, firm to stiff, moist.	2	5/30	5/30	2.62	56.86	1.81	0.98	25	53	58	UU	15	13	0	44							
								8.00 - 11.15 m: SANDY CLAY, greyish brown to grey, high plasticity, firm to stiff, moist.	3	6/30	6/30	2.55	52.97	-	-	23	58	51	-	-	-	-	-	-						
								11.15 - 13.80 m: CLAYEY SAND, grey, very fine to medium grained, poorly graded, medium dense.	4	14/30	14/30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
								13.80 - 15.00 m: SAND, grey, medium to coarse grained, well graded, dense to very dense, containing some amount of GRAVELS with diameter up to 3.00 cm.	5	16/30	16/30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
								6	10/30	10/30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
								7	6/30	6/30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
								8	5/30	5/30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
								9	7/30	7/30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
								10	6/30	6/30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
								11	Ac	Ac	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
								12	As	As	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
								13	20/30	20/30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
								14	50/15	50/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
								15	50/17	50/17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

BOTTOM OF HOLE

LEGEND: CORANG S.P.T. UDS



PT. Geo ACE
Jln. Pajajaran no. 125
BANDUNG, INDONESIA

SOIL MECHANICS SURVEY FOR
THE DETAILED DESIGN OF FLOOD CONTROL,
URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
IN SEMARANG IN THE REPUBLIC OF INDONESIA

BORING LOG

Bore Hole : PB-39	Sheet : 1 of 1	Ground Water Level (GWL) :	meter	Date :	13-9-1997 to 14-9-1997
Location : RIGHT BANK		Coordinate :	x = y =	Drilled by :	Tatang
Boring Depth : 15.00 meter		Angle :	Bearing :	Logged by :	Rudy Mulanto
Elevation : + 7.097 meter		Drilling Machine :	YSO-1	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12		13	14	15	16	17	18	19			20			
									Standard Penetration Test								Atterberg Limits			Strength Test			
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	G.W.L.	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration	Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (t/m ³)	Void Ratio, e	Peak Limit (%)	Plastic Limit (%)	Liquid Limit (%)	Type	Angle Internal friction (°)	Cohesion (kg/cm ²)		
13 SEPTEMBER 1997	1					ML		0.00 - 1.60 m: CLAYEY SILT, brown, low to medium plasticity, firm to stiff, moist; containing some amount of organic and anorganic materials.															
	2			1.60				1.60 - 7.00 m: SILTY CLAY, light brown to brownish grey, high plasticity, stiff to very stiff, moist.		B													
	3																						
	4					CH							2.62	56.91	-	-	26*	60	84				
	5												2.75	43.75	1.619	1.224	26*	58	84	UU	23.13	0.15	
	6																						
	7			7.00			SW	2.75	7.00 - 8.70 m: SILTY SAND, grey, medium to coarse grained, well graded, loose to medium dense.														
14 SEPTEMBER 1997	8			8.70																			
	9							8.70 - 11.00 m: SANDY CLAY, grey, high plasticity, firm, moist.															
	10					CH							2.51	55.11	-	-	27*	56	82				
	11			11.00																			
	12							11.00 - 15.00 m: SAND, grey, medium to coarse grained, well graded, medium dense; having some amount of GRAVELS with diameter up to 3.00 cm.															
	13					SW																	
	14																						
	15			15.00				3.10															

BOTTOM OF HOLE

LEGEND CORES SPT VCS

**SOIL MECHANICS SURVEY FOR
THE DETAILED DESIGN OF FLOOD CONTROL,
URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : RB-31	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 9-9-1997 to 10-9-1997
Location : LEFT BANK	Coordinate : x = y =	Drilled by : UUS	
Boring Depth : 15.00 meter	Angle : Bearing :	Logged by : Rudy Mulyanto	
Elevation : + 8.669 meter	Drilling Machine : YBM-3E	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

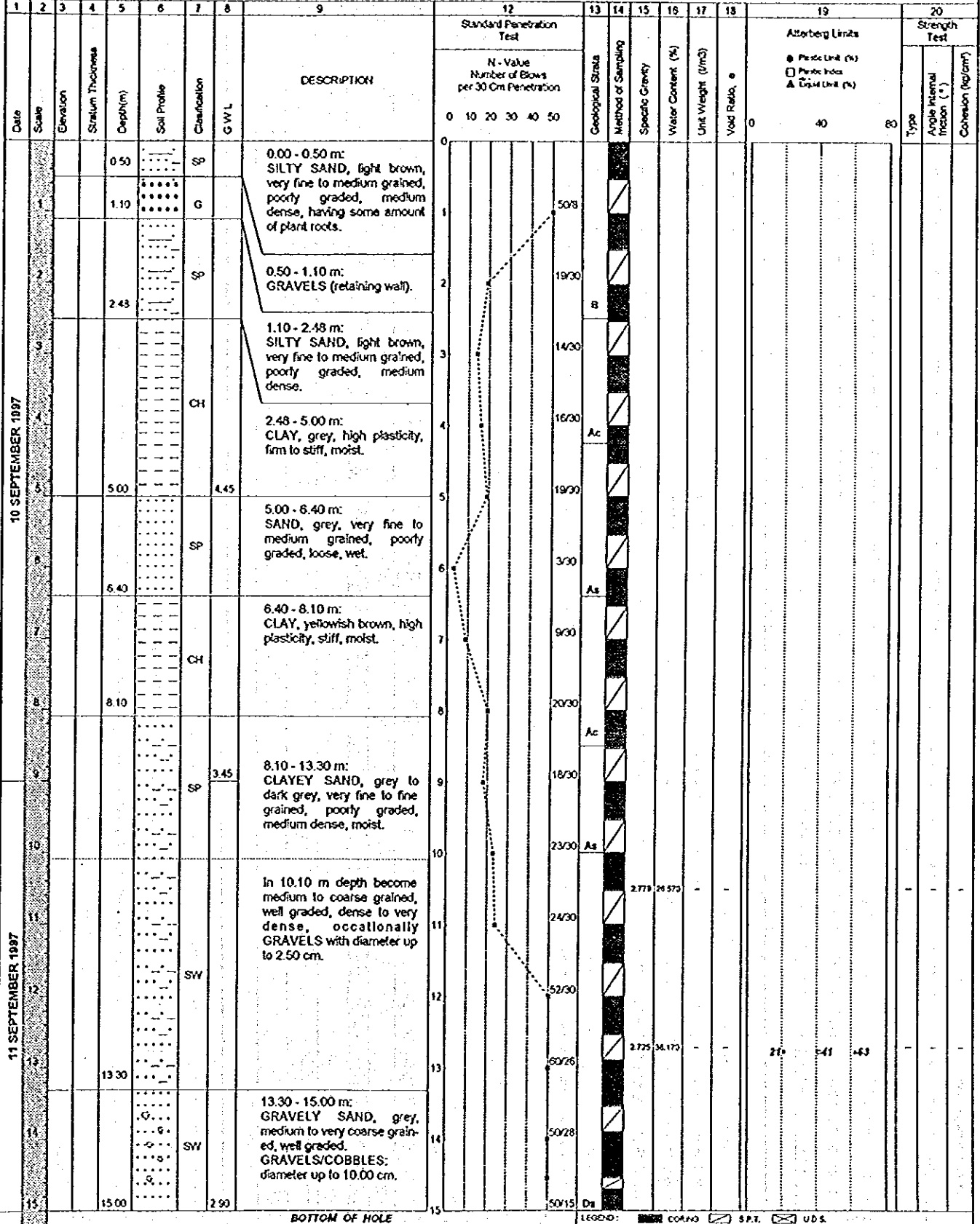
1	2	3	4	5	6	7	8	9	12							19				20											
									Standard Penetration Test					13	14	15	16	17	18	Atterberg Limits			Strength Test								
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration 0 10 20 30 40 50											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (m ³)	Void Ratio, e	Plastic Limit (%)	Plastic Index (%)	Liquid Limit (%)	Type	Angle internal friction (°)	Cohesion (kg/cm ²)
9 SEPTEMBER 1997				5.20	-	CH		0.00 - 5.20 m: SILTY CLAY, brown with yellow & white spotting to grey, medium to high plasticity, firm to stiff, moist.	12/30					B							27	57	79	-	-	-					
								5.20 - 6.80 m: CLAYEY SAND, brownish grey to grey, very fine to very coarse grained, well graded, medium dense; occasionally GRAVELS with diameter up to 1.50 cm.	12/30					As																	
								6.80 - 9.30 m: GRAVELY SAND, grey, coarse to very coarse grained, poorly graded, dense. GRAVELS: angular to subangular, diameter up to 5.00 cm.	10/30								2.576	36.560													
								9.30 - 11.40 m: SAND, grey with white speckling, fine to coarse grained, well graded, medium dense.	7/00																						
								11.40 - 15.00 m: GRAVELY SAND, grey, coarse to very coarse grained, well graded, dense. GRAVELS: subrounded to angular, diameter up to 3.00 cm.	7/00					Ac																	
10 SEPTEMBER 1997				6.80		SW		5.20 - 6.80 m: CLAYEY SAND, brownish grey to grey, very fine to very coarse grained, well graded, medium dense; occasionally GRAVELS with diameter up to 1.50 cm.	14/30					As																	
								6.80 - 9.30 m: GRAVELY SAND, grey, coarse to very coarse grained, poorly graded, dense. GRAVELS: angular to subangular, diameter up to 5.00 cm.	26/30																						
								9.30 - 11.40 m: SAND, grey with white speckling, fine to coarse grained, well graded, medium dense.	36/30								2.887	13.120													
								11.40 - 15.00 m: GRAVELY SAND, grey, coarse to very coarse grained, well graded, dense. GRAVELS: subrounded to angular, diameter up to 3.00 cm.	46/30																						
								15.00 - 15.00 m: GRAVELY SAND, grey, coarse to very coarse grained, well graded, dense. GRAVELS: subrounded to angular, diameter up to 3.00 cm.	27/00																						
				9.30		SW		9.30 - 11.40 m: SAND, grey with white speckling, fine to coarse grained, well graded, medium dense.	44/30																						
								11.40 - 15.00 m: GRAVELY SAND, grey, coarse to very coarse grained, well graded, dense. GRAVELS: subrounded to angular, diameter up to 3.00 cm.	2.850								8.170														
								15.00 - 15.00 m: GRAVELY SAND, grey, coarse to very coarse grained, well graded, dense. GRAVELS: subrounded to angular, diameter up to 3.00 cm.	50/30																						
									50/11																						
									50/13																						
				15.00				15.00 - 15.00 m: GRAVELY SAND, grey, coarse to very coarse grained, well graded, dense. GRAVELS: subrounded to angular, diameter up to 3.00 cm.	50/21					Da																	

BOTTOM OF HOLE

LEGEND: CORNO SPT UDR

Bore Hole : RB-32	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 10-9-1997 to 11-9-1997
Location : RIGHT BANK	Coordinate : x * y *	Drifted by : Teting	Logged by : Rudy Muranto
Boring Depth : 15.00 meter	Angle : Bearing :	Supervisor :	
Elevation : + 8.787 meter	Drilling Machine : YSO-01		

CLASSIFICATION AND DESCRIPTION OF MATERIAL



LEGEND: [Symbol] CORING [Symbol] S.P.T. [Symbol] U.D.S.

Bore Hole : RB-33	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 7-9-1997 to 9-9-1997
Location : LEFT BANK	Coordinate : x = y =	Drilled by : Uus K	
Boring Depth : 15.00 meter	Angle : Bearing :	Logged by : Rudy Muhranta	
Elevation : + 8.909 meter	Drilling Machine : YBM-3E	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19			20												
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (t/m ³)	Void Ratio, e	Atterberg Limits			Strength Test						
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration																					Type	Angle Internal Friction (°)	Cohesion (kg/cm ²)			
7 SEPTEMBER 1997	1:1	8.909	-	-	-	-	-	0.00 - 4.18 m: SILTY CLAY, brown to light brown, high plasticity, soft to stiff, moist, containing some amount of plant roots.	0	10	20	30	40	50	Ac	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
								1	10	20	30	40	50	7/30																	26	47	23		
								2	10	20	30	40	50	5/30																					
								3	10	20	30	40	50	3/30																					
8 SEPTEMBER 1997	1:1	8.909	-	4.18	-	-	3.79	4.18 - 8.10 m: SILTY SAND, grey to dark grey, fine to very coarse grained, well graded, loose to medium dense.	0	10	20	30	40	50	As	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
								4	10	20	30	40	50	3/30																	2.65	51.500			
								5	10	20	30	40	50	6/30																					
								6	10	20	30	40	50	15/30																					
9 SEPTEMBER 1997	1:1	8.909	-	8.10	-	-	3.97	8.10 - 13.10 m: CLAY, greyish brown, high plasticity, stiff to very stiff, moist.	0	10	20	30	40	50	Dc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
								8	10	20	30	40	50	9/30																					
								9	10	20	30	40	50	21/30																					
								10	10	20	30	40	50	21/30																					
9 SEPTEMBER 1997	1:1	8.909	-	13.10	-	-	-	13.10 - 13.55 m: SILTY SAND, grey to dark grey, very fine to medium grained, poorly graded, medium dense.	0	10	20	30	40	50	Dc	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
								11	10	20	30	40	50	31/30																					
								12	10	20	30	40	50	26/30																					
9 SEPTEMBER 1997	1:1	8.909	-	13.55	-	-	-	13.55 - 15.00 m: SANDY GRAVEL, angular to subangular, with diameter up to 4.00 cm.	0	10	20	30	40	50	Dc	-	-	-	-	-	-	-	-	-	-	-	-	-							
								13	10	20	30	40	50	13/30															2.75	43.210	26	47	23		
				15.00			3.99		14	10	20	30	40	50																					

BOTTOM OF HOLE

LEGEND:  CORNO  S.P.T.  UDS

Bore Hole : RB-34	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 8-9-1997 to 9-9-1997
Location : RIGHT BANK	Coordinate : x = y =	Drilled by : Teling	
Boring Depth : 15.00 meter	Angle : Bearing :	Logged by : Rudy Muranto	
Elevation : + 7.493 meter	Drilling Machine : YSO-1	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19			20				
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _{mb})	Void Ratio, e	Atterberg Limits	
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration					● Plastic Limit (%) □ Plastic Index (%) ▲ Liquid Limit (%)	Strength Test												
									0	10	20	30	40			50					0	40	80	120			
8 SEPTEMBER 1997						ML		0.00 - 3.30 m: CLAYEY SILT, light brown to greyish brown, firm to stiff, medium to low plasticity, moist.																			
					3.30			3.30 - 5.00 m: SILTY SAND, grey, very fine to medium grained, poorly graded, loose.								2.61, 2.70							2.26	0.38			
					5.00		SW		5.00 - 7.15 m: SAND, grey, medium to very coarse grained, well graded, medium dense, occasionally GRAVELS with diameter up to 1.50 cm.																		
					7.15			3.06	7.15 - 12.40 m: CLAY, grey to dark brown, high plasticity, stiff, moist, having some amount of GRAVELS, diameter up to 0.5 cm.								2.65, 2.20							2.61	0.62	0.38	
							Ch	4.65	12.40 - 12.55 m: SILTY SAND, yellowish grey, fine to medium grained, well graded, dense.																		
9 SEPTEMBER 1997				12.40		SW		12.55 - 15.00 m: GRAVELY SAND, grey, fine to coarse grained, well graded, very dense.																			
				12.55		SW																					
				15.00			2.80																				
								BOTTOM OF HOLE																			

LEGEND: [Symbol] CORNS [Symbol] S.P.T. [Symbol] U.D.S

SOIL MECHANICS SURVEY FOR
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IN SEMARANG IN THE REPUBLIC OF INDONESIA

BORING LOG

Bore Hole : RB-35	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 31-9-1997
Location : LEFT BANK	Coordinate : x * y *	Drilled by : UUS	
Boring Depth : 10.00 meter	Angle : Bearing :	Logged by : Rudy Mukarto	
Elevation : +10.450 meter	Drilling Machine : YBM-3E	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12				13	14	15	16	17	18	19			20																				
									Standard Penetration Test										Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _m)	Void Ratio, e	Atterberg Limits			Strength Test														
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	GWL	DESCRIPTION	N - Value Number of Blows per 30 Cm Penetration																																	
31 SEPTEMBER 1997	100	10.00		2.10	3.10	3.40	5.00		0.00 - 2.10 m: SANDY SILT, brown, firm to soft, low plasticity, moist; containing some amount of gravels with diameter up to 8.00 cm; cobbles with diameter up to 10.00 cm; some amount of plant roots.	0	11/30	11/30	11/30	11/30																												
									2.10 - 3.10 m: SILTY CLAY, brown, high plasticity, firm to stiff, moist.	2	6/30	6/30	6/30																													
									3.10 - 3.40 m: CLAYEY SAND, brownish grey, medium to coarse grained, well graded, medium dense.	3	17/30	17/30	17/30	B																												
									3.40 - 5.00 m: SILTY CLAY, light brown, high plasticity, stiff, moist.	4	8/30	8/30	8/30																													
									5.00 - 10.00 m: CLAYEY-GRAVELY SAND, brownish grey, fine to medium grained, poorly graded, very dense, well cemented.	5	37/20	37/20	37/20																													
										6	50/17	50/17	50/17																													
										7	50/20	50/20	50/20																													
										8	50/12	50/12	50/12																													
										9	50/5	50/5	50/5																													
										10																																
	11																																									
	12																																									
	13																																									
	14																																									
	15																																									

LEGEND: CORM2 SP1 VPS

Bore Hole : RB - 35	Sheet : 1 of 1	Ground Water Level (GWL) :	meter	Date :	12-9-1997
Location : RIGHT BANK		Coordinate :	x* y*	Drilled by :	Komandi
Boring Depth: 10.00 meter		Angle :	Bearing :	Logged by :	Rudy Mulyono
Elevation : + 5.665 meter		Drilling Machine :	YSO - 1	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12				13	14	15	16	17	18	19				20			
									Standard Penetration Test										Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _m)	Void Ratio, e	Atterberg Limits	
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	G.W.L.	DESCRIPTION	N - Value Number of Blows per 30 Cm Penetration																	
									0 10 20 30 40 50										0 40 80 120							
12 SEPTEMBER 1997				0.55		GP		0.00 - 0.55 m: GRAVEL, subrounded to subangular, diameter up to 4.00 cm.	0																	
								0.55 - 4.40 m: SAND, grey, fine to medium grained, well graded, loose, moist to wet.	5/30																	
						SW			4/30																	
									3/30																	
				4.40					4.40 - 5.00 m: GRAVELLY SAND, grey, medium to coarse grained, well graded, medium dense.	5/30					2.833	19.45										
					5.00		SW			45/30		As														
							CH		5.00 - 6.35 m: SANDY CLAY, grey, high plasticity, firm, moist.	5/30		Ac														
				6.35					6.35 - 10.00 m: GRAVELLY SAND, grey, medium to coarse grained, dense to very dense, well graded.	53/30																
							SW			45/30																
										48/30																
			10.00						58/30		Ds															
								BOTTOM OF HOLE																		

LEGEND: CORNS S.P.T. UDS.



PT. Geo ACE
Jln. Pajajaran no. 125
BANDUNG, INDONESIA

SOIL MECHANICS SURVEY FOR
THE DETAILED DESIGN OF FLOOD CONTROL,
URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
IN SEMARANG IN THE REPUBLIC OF INDONESIA

BORING LOG

Bore Hole : RB-37	Sheet : 1 of 1	Ground Water Level (GWL) :	meter	Date :	3-9-1997 to 4-9-1997
Location : LEFT BANK	Coordinate :	x =	y =	Drilled by :	UCS
Boring Depth : 10.00 meter	Angle :	Bearing :		Logged by :	Rudy Mulianto
Elevation : + 9.735 meter	Drilling Machine :	Y64-3E		Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19				20														
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (kN/m ³)	Void Ratio, e	Atterberg Limits				Type	Strength Test							
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration 0 10 20 30 40 50					Moisture Limit (w _L)	Plasticity Index (I _p)	Liquid Limit (w _L)	Shrinkage Limit (w _s)	Cohesion (kN/cm ²)																				
3 SEPTEMBER 1997 4/3 - 1997									0.00 - 4.35 m: SILTY CLAY, light brown to greyish brown, high plasticity, firm to stiff, moist.																													
BOTTOM OF HOLE																																						

LEGEND UCS SPT

**SOIL MECHANICS SURVEY FOR
 THE DETAILED DESIGN OF FLOOD CONTROL,
 URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
 IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : RB-33	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 9-9-1997 to 10-9-1997
Location : LEFT BANK	Coordinate : x = y =	Drilled by : Komardi	
Boring Depth : 10.00 meter	Angle : Bearing :	Logged by : Rudy Mufianto	
Elevation : + 7.173 meter	Drilling Machine : YSO-1	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12				13	14	15	16	17	18	19			20					
									Standard Penetration Test										Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (t/m ³)	Void Ratio, e	Atterberg Limits		
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	C.W.L.	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration																	● Plastic Limit (%)	□ Plastic Index (%)
9 SEPTEMBER 1997	1:1	7.173	-	0.00 - 1.20	-	ML	-	0.00 - 1.20 m: SANDY SILT, reddish brown, low plasticity, soft to firm, moist; some amount of plant roots.	0	0	0	0	6/30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				1.20 - 1.80		GP		1.20 - 1.80 m: GRAVEL (Andesitic), grey, diameter 7.00 cm (as retaining wall).	1	1	1	1	50/1														
				1.80 - 2.50		CH		1.80 - 2.50 m: SANDY CLAY, greyish brown, high plasticity, wet; having small amount of GRAVELS with diameter up to 1.50 cm.	2	2	2	2	18/30														
				2.50 - 4.10		SW		2.50 - 4.10 m: GRAVELY SAND, brownish grey, coarse to very coarse grained, well graded, dense. GRAVELS: angular to sub-angular, diameter up to 3.00 cm.	3	3	3	3	17/30														
				4.10 - 10.00		CH		4.10 - 10.00 m: CLAY, grey, high plasticity, soft to firm, moist; in 9.00 m depth become SILTY CLAY light brown, hard, moist, occasionally GRAVELS with diameter up to 3.00 cm.	4	4	4	4	6/30														
10 SEPTEMBER 1997	1:1	7.173	-	10.00	-		-	BOTTOM OF HOLE	5	5	5	5	6/30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				11				6	6	6	6	3/30															
				12				7	7	7	7	3/30															
				13				8	8	8	8	3/30															
				14				9	9	9	9	3/30															
15		10.00		10	10	10	10	5/30	51/30	Ac	2782	42.510	27.9	44													

LEGEND: CORE NO. S.P.T. UDS



PT. Geo ACE
Jln. Pajajaran no. 125
BANDUNG, INDONESIA

SOIL MECHANICS SURVEY FOR
THE DETAILED DESIGN OF FLOOD CONTROL,
URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
IN SEMARANG IN THE REPUBLIC OF INDONESIA

BORING LOG

Bore Hole : RB-39	Sheet : 1 of 1	Ground Water Level (GWL) :	meter	Date :	5-9-1997
Location : LEFT BANK		Coordinate :	x = y =	Drilled by :	UUS
Boring Depth : 10.00 meter		Angle :	Bearing :	Logged by :	Rudy Muranto
Elevation : +II.310 meter		Drilling Machine :	YEM-3E	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19				20					
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (t/m ³)	Void Ratio, e	Atterberg Limits			
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration																	● Plastic Limit (%) □ Plastic Index ▲ Liquid Limit (%)			
									0 10 20 30 40 50																				
6 SEPTEMBER 1997				0.45		CH		0.00 - 0.45 m: SILTY CLAY, brown, high plasticity, firm, moist; occasionally GRAVELS with diameter up to 3.00 cm.	0																				
								0.45 - 6.40 m: GRAVELLY SAND, dark grey, coarse to very coarse grained, poorly graded, very dense. GRAVELS, COBBLES: andesitic, angular to subangular, diameter up to 10.00 cm.	1	22/30																			
									2	50/10																			
									3	50/5																			
									4	50/4																			
									5	50/2																			
									6	50/6																			
					6.40				6.40 - 10.00 m: TUFFACEOUS SAND, yellowish grey, fine to coarse grained, well graded, very dense, moist.	7	78/30																		
										8	47/30																		
										9	45/30																		
				10.00			6.90	BOTTOM OF HOLE	10	43/30	Dr				2.675	30.210													
									11																				
									12																				
									13																				
									14																				
									15																				

LEGEND: [Symbol] COARSE [Symbol] SPT [Symbol] UGS

**SOIL MECHANICS SURVEY FOR
THE DETAILED DESIGN OF FLOOD CONTROL,
URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT
IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : RB- 40	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 7-9-1997 to 8-9-1997
Location : RIGHT BANK	Coordinate : X* y *	Drilled by : Komardi	
Boring Depth : 10.00 meter	Angle : Bearing :	Logged by : Rudy Mukarto	
Elevation : +10.859 meter	Drilling Machine : YSO-01	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12										19			20														
									Standard Penetration Test	N-Value Number of Blows per 30 Cm Penetration					13	14	15	16	17	18	Atterberg Limits			Strength Test												
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	GWL	DESCRIPTION	0	10	20	30	40	50							Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (kN/m3)	Void Ratio, e	0	40	60	120	Type	Angle Internal Friction (°)	Cohesion (kN/m ²)			
7 SEPTEMBER 1997								0.00 - 3.42 m: SILTY CLAY, brown, high plasticity, firm to stiff.	0						900																					
							CH		1						900																					
					3.42				2						900																					
									3						1100			2.70	20.815	-	-			21	42	63										
								SW	3.42 - 6.05 m: GRAVELY SAND, brownish grey, fine to coarse grained, well graded, dense to very dense. GRAVELS: subangular to subrounded, diameter up to 7.00 cm.	4						4300																				
									5						5200																					
8 SEPTEMBER 1997				6.05			GW	6.05 - 10.00 m: SANDY GRAVEL-COBBLE, grey, subangular to subrounded, diameter up to 10.00 cm.	6						5100																					
								7						5100																						
								8						5200																						
								9						5500																						
					10.00				10						5200			2.86	5.000	-	-															
								11																												
								12																												
								13																												
								14																												
								15																												
									BOTTOM OF HOLE																											

LEGEND: SAND SPT UDS



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**SOIL MECHANICS SURVEY FOR
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IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : RB - 41	Sheet : 1 of 1	Ground Water Level (GWL) :	meter	Date :	5 - 9 - 1997 to 6 - 9 - 1997
Location : LEFT BANK		Coordinate :	x = y =	Drilled by :	Ade K. Kosasih
Boring Depth : 10.00 meter		Angle :	Bearing :	Logged by :	Rudy M. Rianto
Elevation : + 9.304 meter		Drilling Machine :	YBM - 3ES	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12				13	14	15	16	17	18	19			20										
									Standard Penetration Test										Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _{mo})	Void Ratio, e	Atterberg Limits			Strength Test				
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	G.W.L.	DESCRIPTION	N - Value Number of Blows per 30 Cm Penetration																● Plastic Limit (%)	□ Plastic Index (%)	▲ Liquid Limit (%)	Type	Angle Internal Friction (°)	Cohesion (kg/cm ²)		
									0 10 20 30 40 50										0 40 80													
6 SEPTEMBER 1997	m	9.304		2.00	[Soil Profile]	CH	4.45	0.00 - 2.00 m: SANDY-SILTY CLAY, light brown, high plasticity, stiff, moist.	0	1	2	3	4	5	6	7	8	9	10													
6 SEPTEMBER 1997	m	9.304		5.00	[Soil Profile]	CH	3.50	2.00 - 5.00 m: SANDY CLAY, brown, high plasticity, hard, moist.	11/00	13/00	11/00	30/00	56/00	51/13	51/15	50/15	50/12	50/8														
				10.00				5.00 - 10.00 m: CLAYEY SAND, greyish brown, fine to medium grained, well graded, dense to very dense; occasionally GRAVELS: diameter up to 3.00 cm.																								
						SW																										
								BOTTOM OF HOLE																								

LEGEND: [Symbol] CORING [Symbol] SPT [Symbol] UDS



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BANDUNG, INDONESIA

**SOIL MECHANICS SURVEY FOR
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IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : RB - 42	Sheet : 1 of 1	Ground Water Level (GYL) : _____ meter	Date : 5-9-1997 to 6-9-1997
Location : RIGHT BANK	Coordinate : x = _____ y = _____	Drilled by : Tarang	
Boring Depth : 10.00 meter	Angle : _____ Bearing : _____	Logged by : Rudy Muliarto	
Elevation : +11.064 meter	Drilling Machine : YSO-01	Supervisor : _____	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19				20					
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _m)	Void Ratio, e	Atterberg Limits			
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration					Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _m)	Void Ratio, e							Liquid Limit (%)	Plastic Limit (%)	Shrinkage Limit (%)	Type
									0	10	20	30	40							50	0	40	80	120					
6 SEPTEMBER 1997	1			155	[Soil Profile]	SP		0.00 - 1.55 m: SILTY SAND, brown, very fine to fine grained, poorly graded, very dense, having some amount of plant roots.	0	12/30																			
	2				[Soil Profile]	CH		1.55 - 3.05 m: SILTY CLAY, grey, high plasticity, firm, moist.	2	9/30																			
	3			305	[Soil Profile]	CH		3.05 - 5.70 m: GRAVELY CLAY, brown, high plasticity, firm, moist.	3	23/30																			
	4				[Soil Profile]	CH	4.25		5.70 - 10.00 m: GRAVELY SAND, grey, fine to medium grained, well graded, very dense. GRAVELS: diameter up to 8.00 cm.	4	21/30	B	2347	24420								26	63	52					
6 SEPTEMBER 1997	5			570	[Soil Profile]	SW			5	50/13	Ac																		
	6				[Soil Profile]				6	50/14																			
	7				[Soil Profile]				7	51/12																			
	8				[Soil Profile]				8	50/13																			
	9				[Soil Profile]				9	50/20																			
	10			10.00	[Soil Profile]		6.00		10	50/18	Da																		
								BOTTOM OF HOLE																					

LEGEND: [Symbol] CORNS [Symbol] SPT [Symbol] UDS



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**SOIL MECHANICS SURVEY FOR
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IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : R3 - 43	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 2 - 9 - 1997 to 3 - 9 - 1997
Location : LEFT BANK	Coordinate : x = y =	Drilled by : Ade K Kosasih	
Boring Depth : 10.00 meter	Angle : Bearing :	Logged by : Rudy M. Arto	
Elevation : +10.040 meter	Drilling Machine : YBM - 3ES	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19							20				
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _m)	Void Ratio, e	Atterberg Limits					
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration																						
									10	20	30	40	50							0	10	20	30	40	50	60	70				
2 SEPTEMBER 1997	1							0.00 - 2.10 m: SILTY SAND, light brown, very fine to fine grained, poorly graded, medium dense; having some amount of plant roots.																							
	2			2.10				2.10 - 5.60 m: SILTY CLAY, brown to light brown, high plasticity, stiff, moist.						17/30																	
	3							5.60 - 7.40 m: CLAYEY SAND, brown, fine very fine grained, medium to poorly graded, dense to very dense. Containing some amount of GRAVELS with diameter up to 3.00 cm, angular to subangular.						15/30																	
	4														44/30	Ac															
	5				5.60				7.40 - 8.30 m: CLAY, reddish brown, very stiff to hard, high plasticity, moist.						65/30																
	6															73/13															
	3 SEPT. 1997	7			7.40				8.30 - 10.00 m: SANDY CLAY, brown to greyish brown, high plasticity, very stiff to hard, moist.						50/14																
8															50/6																
9				8.30										50/5																	
10				10.00			4.40	BOTTOM OF HOLE						50/12	Da																
11																															
12																															
13																															
14																															
15																															



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IN SEMARANG IN THE REPUBLIC OF INDONESIA**

BORING LOG

Bore Hole : RB - 44	Sheet : 1 of 1	Ground Water Level (GWL):	meter	Date :	5-9-1997 to 6-9-1997
Location : RIGHT BANK		Coordinate :	x = y =	Ordned by :	Asep Sobandi
Boring Depth : 10.00 meter		Angle :	Bearing :	Logged by :	Rudy Mulranto
Elevation : +11,810 meter		Drilling Machine :	YBM - 3ES	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12						19				20													
									Standard Penetration Test						13	14	15	16	17	18	Atterberg Limits				Strength Test							
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	G.W.L.	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration												Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _m)	Void Ratio, e	● Plastic Limit (%) □ Plastic Index (%) ▲ Liquid Limit (%)				Type	Angle internal friction (°)
									0	10	20	30	40	50	0	20	40	60	80													
20 AUGUST 1997								0.00 - 3.55 m: SILTY CLAY, brown, medium to high plasticity, firm to stiff, moist, having some amount of plant roots; and small amount of GRAVELS in 3.40 m depth, angular to subrounded, diameter up to 8.00 cm.																								
					3.55			3.55 - 5.00 m: CLAYEY SAND, brownish grey, very fine to medium grained, poorly graded, occasionally GRAVELS with diameter up to 3.00 cm.																								
					5.00		SP	5.00 - 6.10 m: SANDY GRAVEL, subrounded to subangular, diameter 0.50 to 5.00 cm.							65/27		2.54	22.470								25	31	45				
					6.10		GW	6.10 - 7.30 m: SANDY CLAY, greyish brown to brown, high plasticity, firm, moist; containing small amount of GRAVELS, diameter up to 1.50 cm.							50/13																	
					7.30		CH	7.30 - 9.05 m: SANDY SILT, brown to reddish brown, medium to low plasticity, stiff to very stiff, moist, having small amount of GRAVELS with diameter up to 1.00 cm.							23/30																	
								450																								
					9.05		ML	9.05 - 10.00 m: CLAYEY SAND, brown, very fine to fine grained, poorly graded, dense to very dense, with some amount of GRAVELS, diameter up to 1.00 cm.							24/30		2.54	24.500										20	50	73		
					10.00		SP								71/30																	
									BOTTOM OF HOLE						505																	

LEGEND: CORE S.P.T. U.D.S.

Bore Hole : RB - 46	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 2-9-1997 to 3-9-1997
Location : RIGHT BANK		Coordinate : x = y =	Drilled by : Asep/Sobandi
Boring Depth : 10.00 meter		Angle : Bearing :	Logged by : Rudy Muhranto
Elevation : +11.457 meter		Drilling Machine : YBM - 3E	Supervisor :

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12				13	14	15	16	17	18	19				20										
									Standard Penetration Test										Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _{sat})	Void Ratio, e	Atterberg Limits				Type	Strength Test			
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	GWL	DESCRIPTION	N - Value Number of Blows per 30 Cm Penetration				0	10	20	30	40	50							0	40	80	120		160	Angle internal friction (°)	Cohesion (kg/cm ²)	
2 SEPTEMBER 1997				3.00	[Soil Profile: Silty Clay]	CH	4.50	0.00 - 3.00 m: SILTY CLAY, brown, high plasticity, firm to stiff.	[SPT Chart: 0 to 3.00m]										[Strata Column]	[Sampling Method]	[Specific Gravity]	[Water Content]	[Unit Weight]	[Void Ratio]					[Atterberg Limits]				[Type]
								3.00 - 9.00 m: SANDY GRAVEL, subrounded to subangular, diameter up to 8.00 cm.	[SPT Chart: 3.00 to 9.00m]				[Atterberg Limits]																				
								9.00 - 10.00 m: GRAVELY SAND, grey, fine to very coarse grained, well graded, very dense.	[SPT Chart: 9.00 to 10.00m]				[Atterberg Limits]																				
								BOTTOM OF HOLE									[SPT Chart: 10.00 to 15.00m]								[Atterberg Limits]				[Strength Test]				
								3 SEPTEMBER 1997				10.00	[Soil Profile: Gravelly Sand]	SW	4.50		[SPT Chart: 10.00 to 11.00m]								[Atterberg Limits]				[Strength Test]				
																	[SPT Chart: 11.00 to 12.00m]								[Atterberg Limits]				[Strength Test]				
																	[SPT Chart: 12.00 to 13.00m]								[Atterberg Limits]				[Strength Test]				
																	[SPT Chart: 13.00 to 14.00m]								[Atterberg Limits]				[Strength Test]				
																	[SPT Chart: 14.00 to 15.00m]								[Atterberg Limits]				[Strength Test]				

LEGEND: [Symbol] CORING [Symbol] S.P.T. [Symbol] U.D.



PT. Geo ACE
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BANDUNG, INDONESIA

SOIL MECHANICS SURVEY FOR
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IN SEMARANG IN THE REPUBLIC OF INDONESIA

BORING LOG

Bore Hole : RB-47	Sheet : 1 of 1	Ground Water Level (GWL):	meter	Date :	29-9-1997 to 30-9-1997
Location : LEFT BANK		Coordinate	x = y =	Drilled by :	Ade K/Kosasih
Boring Depth: 10.00 meter		Angle	Bearing :	Logged by :	Rudy Mukarto
Elevation : +10.393 meter		Drilling Machine	: YBM-3ES	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19				20																											
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (t/m3)	Void Ratio, e	Atterberg Limits				Type	Angle Internal friction (°)	Cohesion (kg/cm ²)																			
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration					<input type="checkbox"/> Plastic Limit (%) <input type="checkbox"/> Plastic Index (%) <input type="checkbox"/> Liquid Limit (%)																																					
									10	20	30	40	50					0	40	80	120																														
29 SEPTEMBER 1997				0.40		SP	2.80	0.00 - 0.40 m:	0.00 - 0.40 m: SILTY SAND, brownish grey, fine to medium grained, loose, poorly graded. 0.40 - 1.40 m: SANDY SILT, brown, medium to low plasticity, stiff, moist. Occasionally gravels with diameter up to 4.00 cm. 1.40 - 3.40 m: SANDY CLAY, greyish brown, high plasticity, stiff moist. 3.40 - 5.00 m: SANDY-GRAVELLY CLAY, greyish brown, firm, high plasticity, moist. SAND: grey, fine to medium grained, poorly graded, medium dense. GRAVELS (SANDSTONE): grey to white, medium to coarse grained, medium to well cemented. 5.00 - 10.00 m: GRAVELLY SAND, grey, medium to very coarse grained, dense to very dense, well graded, moist to wet. GRAVELS and COBBLES (of SANDSTONE & ANDESITIC rock fragments): subangular to subrounded, diameter up to 10.00 cm. BOTTOM OF HOLE																																										
				1.40				ML																																											
30 SEPTEMBER 1997				3.40		CH	2.50																																												
				5.00																																															
				10.00																																															

LEGEND: CORNO S.P.T. UDS

Bore Hole: RB-43	Sheet: 1 of 1	Ground Water Level (GWL):	meter	Date:	30-9-1997 to 31-9-1997
Location: RUMAH BAKAR		Coordinate:	x = y =	Drifted by:	Asep/Sobandi
Boring Depth: 10.00 meter		Angle:	Bearing:	Logged by:	Rudy M. dranto
Elevation: + 9.711 meter		Drilling Machine:	YBM-3E	Supervisor:	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1 Date	2 Scale	3 Elevation	4 Stratum Thickness	5 Depth (m)	6 Soil Profile	7 Classification	8 G.W.L.	9 DESCRIPTION	12 Standard Penetration Test					13 Geological Strata	14 Method of Sampling	15 Specific Gravity	16 Water Content (%)	17 Unit Weight (kN/m ³)	18 Void Ratio, e	19 Atterberg Limits			20 Strength Test			
									N-Value Number of Blows per 30 Cm Penetration											● Plastic Limit (%) □ Plastic Index (%) ▲ Liquid Limit (%)			Type	Angle Internal friction (°)	Cohesion (kg/cm ²)	
10									10	20	30	40	50						0	20	40	60				
30 SEPTEMBER 1997								0.00 - 3.00 m: SILTY SAND, brown, fine to very fine grained, poorly graded, loose; occasionally gravels/cobbles with diameter up to 10.00 cm.																		
31 SEPTEMBER 1997								3.00 - 7.70 m: SILTY-GRAVELLY SAND, grey to dark brown, fine to very coarse grained, well graded, very dense. GRAVELS: diameter up to 4.00 cm.																		
								7.70 - 9.80 m: SILTY SAND, dark brown, fine to very fine grained, poorly graded.																		
								9.80 - 10.00 m: GRAVELLY SAND, grey, medium to coarse grained, well graded, dense very dense.																		
								BOTTOM OF HOLE																		

LEGEND: █ CORING █ S.P.T. █ U.G.S.



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BORING LOG

Bore Hole : PB-49	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 26-9-1997 to 28-9-1997
Location : RIGHT BANK	Coordinate : x = y =	Drilled by : Ade K. Kosasih	
Boring Depth : 10.00 meter	Angle : Bearing :	Logged by : Rudy Murtanto	
Elevation : + 9.268 meter	Drilling Machine : YBM-3E	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19				20												
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _m)	Void Ratio, e	Atterberg Limits				Strength Test						
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration																	● Plastic Limit (%) □ Plastic Index (%) ▲ Liquid Limit (%)				Type	Angle Internal Friction (°)	Cohesion (kg/cm ²)				
									10	20	30	40	50						0	10	20	30	40													
26 SEPTEMBER 1997				1.55		SW	2.60	0.00 - 1.55 m: SILTY SAND, greyish brown, fine to medium grained, well graded, loose; having some amount of plant roots.	18/30																											
				2.00		GP		1.55 - 2.00 m: GRAVELS, grey to brownish grey, hard, rounded to subrounded, poorly graded, diameter up to 8.00 cm.	50/10																											
				2.64		SP		2.00 - 2.64 m: GRAVELY SAND, brownish grey, medium to coarse grained, poorly graded, very dense.	50/9					27/23	14.000	1.858	0.832																			
				3.20		GP		2.64 - 3.20 m: GRAVELS, grey, hard, rounded to subrounded, poorly graded, diameter up to 8.00 cm, medium to coarse grained, poorly graded (in 3.00 m depth become sandy gravel).	50/9					50/5																						
27 SEPTEMBER 1997				6.60		CH	1.50	3.20 - 6.60 m: GRAVELY-CLAYEY SAND, grey to dark grey, medium to coarse grained, poorly graded, dense.	39/30																											
				7.00				SP	6.60 - 7.00 m: SANDY-GRAVELY CLAY, grey to dark grey, high plasticity, firm to stiff, moist.	50/5																										
28 SEPTEMBER 1997				10.00		SP	2.10	7.00 - 10.00 m: GRAVELY SAND, coarse to very coarse grained, poorly graded, very dense.	50/9																											
								BOTTOM OF HOLE																												

LEGEND: COARS S.P.L. U.D.S.



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BORING LOG

Bore Hole : RB-50	Sheet : 1 of 1	Ground Water Level (GWL) :	meter	Date :	28-9-1997 to 29-9-1997
Location : RIGHT BANK		Coordinate :	x = y =	Drilled by :	Asep Sobandi
Boring Depth : 10.00 meter		Angle :	Bearing :	Logged by :	Rudy M. Aranto
Elevation : +10.411 meter		Drilling Machine :	YBM-3E	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					19				20								
									Standard Penetration Test					13	14	15	16	17	18	Atterberg Limits				Strength Test		
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _m)	Void Ratio, e	Type
									0 10 20 30 40 50									0 20 40 60 80								
28 SEPTEMBER 1997				0.70				0.00 - 0.70 m: SILTY SAND, light brown, fine to medium grained, well graded, loose; having some amount of plant roots.																		
				2.20				0.70 - 2.20 m: SILTY CLAY, brown, soft, high plasticity, moist.																		
				2.70				2.20 - 2.70 m: SANDY CLAY, brownish grey, high plasticity, soft to firm, moist.																		
				3.68				2.70 - 3.68 m: GRAVELS: subrounded to subangular, diameter up to 8.00 cm.																		
				4.20				SANDSTONE: yellowish grey, fine to medium grained, well cemented, highly weathered.																		
29 SEPTEMBER 1997								3.68 - 4.20 m: GRAVELLY CLAY, brown, high plasticity, stiff, moist. GARVELS (andesitic): sub- rounded to subangular, dia- meter up to 8.00 cm; derived from volcanic materials.																		
								4.20 - 10.00 m: SANDY GRAVEL (andesitic), subrounded to subangular, diameter up to 8.00 cm.																		
								BOTTOM OF HOLE																		

LEGEND: CORING S.P.T. U.D.S.



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BORING LOG

Bore Hole : RB-51 Sheet : 1 of 4 Ground Water Level (GWL) : meter Date : 30-9-1997 to 7-10-1997
Location : GARANG RIVER Coordinate : x * y * Drilled by : Tetang
Boring Depth : 50.00 meter Angle : Bearing : Logged by : Rudy Muranto
Elevation : * meter Drilling Machine : YSO-1 Supervisor :

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19				20			
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (k/m ³)	Void Ratio, e	Atterberg Limits	
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration																	● Plastic Limit (%) □ Plastic Index (%) ▲ Liquid Limit (%)	
									0	10	20	30	40	50						0	40	80	120				
30 SEPTEMBER 1997								0.00 - 1.60 m: SAND, grey, medium to coarse grained, well graded, loose, some amount of organic materials (plant remains), occasionally of gravels with diameter up to 2.00 cm.																			
				1.60				1.60 - 2.00 m: GRAVEL (pillar foundation).																			
				2.00				2.00 - 2.55 m: SILTY SAND, grey, very fine to fine grained, poorly graded, very loose, containing some mollusca shells.																			
				2.55				2.55 - 11.55 m: SANDY CLAY, grey, high plasticity, very soft to firm, moist, containing some mollusca shells.																			
1 OCTOBER 1997																											
3 OCTOBER 1997																											

LEGEND: CORANG SPT UDS

Bore Hole : RB-51	Sheet : 2 of 4	Ground Water Level (GWL) : meter	Date : 30-9-1997 to 7-10-1997
Location : GARANG RIVER	Coordinate : " "	Coordinate : " "	Drawn by : Tefang
Boring Depth : 50.00 meter	Angle : " "	Bearing : " "	Logged by : Rudy Mubanto
Elevation : + meter	Drilling Machine : YSO-1		Supervisor : " "

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12		13	14	15	16	17	18	19				20	
									Standard Penetration Test								Atterberg Limits				Strength Test	
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration		Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _{sat})	Void Ratio, e	● Plastic Limit (%)	□ Plastic Index (%)	▲ Liquid Limit (%)	Type	Angle internal friction (°)	Cohesion (kg/cm ²)
									0 10 20 30 40 50							0	40	60	120			
3 OCTOBER 1997							2.10	11.55 - 26.30 m: CLAY, light brown to brown, stiff to hard, high plasticity, moist.														
4 OCTOBER 1997						CH																
6 OCTOBER 1997							4.15	26.30 - 27.20 m: SILTY SAND, greyish brown to yellowish brown, fine to medium grained, dense, poorly graded.														
						SP		27.20 - 30.23 m: CLAY, light brown to brown, very stiff to hard, high plasticity, moist.														
						CH																



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BORING LOG

Bore Hole : RB-51	Sheet : 3 of 4	Ground Water Level (GWL) :	meter	Date :	30-9-1997 to 7-10-1997
Location : GARANG RIVER	Coordinate :	x "	y "	Drilled by :	Tirano
Boring Depth : 50.09 meter	Angle :	Bearing :		Logged by :	Rudy Muranto
Elevation : + meter	Drilling Machine :	Y90-1		Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19				20						
									Standard Penetration Test											Geological State	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _{sat})	Void Ratio, e	Atterberg Limits				Strength Test
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration																		● Plastic Limit (%) □ Plastic Index (%) ▲ Liquid Limit (%)			
									0	10	20	30	40	50							0	40	80	120						
5 OCTOBER 1997	50			30.23		CH		ditto to sheet 2 of 4 (depth 27.30 - 30.23 m)	30						51/00	Dc														
		51						30.23 - 34.20 m: SAND, brownish grey to grey, coarse to very coarse grained, very dense; with some amount of gravels with diameter up to 8.00 cm (derived from highly weathered volcanic breccia).								50/20														
		52					SW								50/12															
		53													50/16															
		54			34.20		CH	10.25	34.20 - 35.40 m: CLAY, brown, hard, high plasticity, moist.							30/25														
		55			35.40		SW		35.40 - 37.05 m: SILTY SAND, brownish grey, fine to medium grained, moderately to well graded, very dense.							50/25	Dg													
		56			37.05		ML		37.05 - 38.05 m: CLAYEY SILT, light brown, low plasticity, very stiff, moist.							50/13	Ds													
		57			38.05		CH		38.05 - 39.90 m: CLAY, brown, high plasticity, hard, moist.							26/00														
	6 OCTOBER 1997	58			39.90		CH								44/00	Dc														
			59						39.90 - 50.00 m: SAND, dark grey, fine to medium grained, very dense, poorly to medium graded, some amount of gravels, angular to subrounded, diameter up to 4.00 cm (derived from highly weathered volcanic breccia).							51/00														
		60													50/14															
		61													50/23	Ds														
		62					SP								50/16	Dg														
	63													50/18																
	64						13.15								50/10	Ds														
	65														50/10	Ds														



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BORING LOG

Bore Hole: R8-51	Sheet: 4 of 4	Ground Water Level (GWL):	meter	Date:	30-9-1997 to 7-10-1997
Location: GARANG RIVER		Coordinate:	x = y =	Drafted by:	Tatang
Boring Depth: 50.00 meter		Angle:	Boring:	Logged by:	Rudy Muranto
Elevation: + meter		Drilling Machine:	YBM-3E	Supervisor:	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12						13	14	15	16	17	18	19				20								
									Standard Penetration Test												Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ/m³)	Void Ratio, e	Atterberg Limits				Type	Strength Test	
									N-Value Number of Blows per 30 Cm Penetration																		<input type="checkbox"/> Plastic Limit (%) <input type="checkbox"/> Plastic Index (%) <input type="checkbox"/> Liquid Limit (%)					Angle internal friction (°)	Cohesion (kg/cm²)
								DESCRIPTION	0	10	20	30	40	50						0	40	80	120										
								33.90 - 50.00 m; SAND, dark grey, fine to medium grained, very dense, poorly to medium graded, some amount of gravels, angular to subrounded, diameter up to 4.00 cm (derived from highly weathered volcanic breccia).	45						50/10																		
									46						50/14																		
									47						50/9																		
									48						50/25																		
									49						54/30																		
									50						50/13																		
				50.00				14.05	50																								
								BOTTOM OF HOLE	51																								
									52																								
									53																								
									54																								
									55																								
									56																								
									57																								
									58																								
									59																								
									60																								

LEGEND: [Symbol] CORNS [Symbol] S.P.T. [Symbol] U.D.S.



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BORING LOG

Bore Hole : RB-52	Sheet : 1 of 1	Ground Water Level (GWL) : meter	Date : 15-10-1997 to 18-10-1997
Location : GARANG RIVER	Coordinate : x = y =	Drilled by : Sudarmadji	
Boring Depth : 50.00 meter	Angle : Bearing :	Logged by : Rudy Muhrato	
Elevation : + meter	Drilling Machine : YBM-3ES	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1 Date	2 Scale	3 Elevation	4 Stratum Thickness	5 Depth(m)	6 Soil Profile	7 Classification	8 GWL	9 DESCRIPTION	12 Standard Penetration Test					13 Geological Strata	14 Method of Sampling	15 Specific Gravity	16 Water Content (%)	17 Unit Weight (k/m ³)	18 Void Ratio, e	19 Atterberg Limits			20 Strength Test																											
									N-Value Number of Blows per 30 Cm Penetration											● Plastic LI-L (%)	□ Plastic Index (PI)	▲ Liquid LI-L (%)	Type	Angle Internal Friction (°)	Cohesion (kg/cm ²)																									
									0	10	20	30	40	50				0	40	80	120																													
15 OCTOBER 1997				0.80			ML	0.00 - 0.80 m: CLAYEY SILT, light brown, firm, low plasticity, moist, some amount of plant roots.																																										
							CH	0.80 - 5.20 m: SILTY CLAY, brown to brownish grey, high plasticity, soft to firm, moist.																																										
					5.20				5.20 - 15.30 m: SANDY CLAY, brownish grey to grey, high plasticity, soft to firm, moist, containing some amount of mofusca shells.																																									
							CH																																											

LEGEND: ■ CORP. ⊠ S.P.T. ⊞ V.S.

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BORING LOG

Bore Hole : RB - 52	Sheet : 2 of 4	Ground Water Level (GWL) : meter	Date : 15 - 10 - 1997 to 18 - 10 - 1997
Location : GARANG RIVER	Coordinate : x = y =	Drilled by : Sudarmaji	
Boring Depth : 50 (m)	Angle : Bearing :	Logged by : Rusty Muranto	
Elevation : + meter	Drilling Machine : YBM - 3ES	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19				20				
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _m)	Void Ratio, e	Atterberg Limits		
Date	Scale	Elevation	Stratum Thickness	Depth (m)	Soil Profile	Classification	GWL	DESCRIPTION	N - Value Number of Blows per 30 Cm Penetration					Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _m)	Void Ratio, e							Atterberg Limits		
									0	10	20	30	40							50							0	40
15				15.30		CH		5.20 - 15.30 m: SANDY CLAY, brownish grey to grey, high plasticity, soft to firm, moist, containing some amount of mollusca shells.	15						600													
16						SW		15.30 - 17.10 m: SILTY SAND, yellowish brown, medium to coarse grained, medium dense to dense, well graded.	16						3100													
17				17.10			11.70	17.10 - 25.00 m: CLAY, greyish brown to brown, high plasticity, hard, moist, small amount of gravels, with diameter up to 0.30 cm.	17						2700													
18									18						4700													
19									19						5000													
20									20						4500													
21						CH			21						5200													
22									22						3000													
23									23						3300													
24									24						3600													
25				25.00				25.00 - 26.80 m: CLAYEY SAND, yellowish brown, medium to coarse grained, well graded, dense.	25						4700	Dc												
26						SW			26						4300													
27				26.80				26.80 - 29.15 m: SILTY CLAY, dark brown, high plasticity, hard, moist.	27						4300	Ds												
28						CH			28						3900													
29				29.15				29.15 - 31.40 m: SILTY SAND, grey medium to coarse grained, well graded, dense to very dense, containing gravels with diameter up to 8.00 cm.	29						4000	Dc	2.80	17.660				32	143	174				
30						SW	11.60		30						4400													

LEGEND: CORN S.P.T. U.O.S.



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BORING LOG

Bore Hole : RB - 52	Sheet : 3 of 4	Ground Water Level (GWL) : meter	Date : 15 - 10 - 1997 to 18 - 10 - 1997
Location : GARANG RIVER	Coordinate : x = y =	Drilled by : Susamadj	
Boring Depth : 50.00 meter	Angle : Bearing :	Logged by : Rudy Muranto	
Elevation : + meter	Drilling Machine : YBM - 3ES	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19				20																																																												
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (kN/m ³)	Void Ratio, e	Atterberg Limits				Type	Strength Test																																																					
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	GWL	DESCRIPTION	N - Value Number of Blows per 30 Cm Penetration																																																																											
									0	10	20	30	40	50						0	40	80	120																																																													
17 OCTOBER 1997	1:1	31.40		31.40	[Soil Profile]	SW		29.15 - 31.40 m: SILTY SAND, grey medium to coarse grained, well graded, dense to very dense, containing gravels with diameter up to 8.00 cm.	30							Dg																																																																				
								18 OCTOBER 1997	1:1	32.88		32.88	[Soil Profile]	CH		31.40 - 32.88 m: SANDY CLAY, brown to greyish brown, high plasticity, hard, moist, containing some amount of gravels with diameter up to 4.00 cm.	32						Dc																																																													
																18 OCTOBER 1997	1:1	36.65		36.65	[Soil Profile]	SW		32.88 - 36.65 m: SAND, grey, fine to coarse grained, well graded, dense, containing some amount of gravels with diameter up to 4.00 cm.	34						Ds																																																					
																								18 OCTOBER 1997	1:1	38.00		38.00	[Soil Profile]	CH		36.65 - 38.00 m: SANDY CLAY, dark brown to brown, hard, high plasticity, moist.	37						Dc																																													
																																18 OCTOBER 1997	1:1	39.00		39.00	[Soil Profile]	SW		38.00 - 39.00 m: SAND, grey, fine to medium grained, well graded, dense to very dense, occasionally gravels with diameter up to 2.00 cm.	38						Ds																																					
																																								18 OCTOBER 1997	1:1	41.15		41.15	[Soil Profile]	SP		39.00 - 41.15 m: SAND, grey, very fine to fine grained, poorly graded, very dense.	39						Ds																													
																																																18 OCTOBER 1997	1:1	43.35		43.35	[Soil Profile]	SW		41.15 - 43.35 m: SAND, grey, medium to coarse grained, well graded, very dense; containing some amount of gravels with diameter up to 5.00 cm (derived from highly weathered of volcanic breccia).	41						Ds																					
																																																								18 OCTOBER 1997	1:1	45.25		45.25	[Soil Profile]	GP		43.35 - 45.25 m: GRAVEL, andesitic, subrounded to subangular, diameter up to 8.00 CM.	44						Ds													

LEGEND: [Symbol] COARSE [Symbol] S.F. [Symbol] V.D.S.



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BORING LOG

Bore Hole : RB - 52	Sheet : 4 of 4	Ground Water Level (GWL) : meter	Date : 15 - 10 - 1997 to 18 - 10 - 1997
Location : GARANG RIVER	Coordinate : X = Y =	Drilled by : Sudarmoaji	
Boring Depth : 50.00 meter	Angle : Bearing :	Logged by : Rudy Mukranto	
Elevation : + meter	Drilling Machine : YBM - 3CS	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1 Date	2 Scale	3 Elevation	4 Stratum Thickness	5 Depth(m)	6 Soil Profile	7 Classification	8 GWL	9 DESCRIPTION	12 Standard Penetration Test					13 Geological Strata	14 Method of Sampling	15 Specific Gravity	16 Water Content (%)	17 Unit Weight (kN/m ³)	18 Void Ratio, e	19 Atterberg Limits				20 Strength Test	
									N - Value Number of Blows per 30 Cm Penetration											<input type="checkbox"/> Plastic Limit (%) <input type="checkbox"/> Plastic Index (%) <input type="checkbox"/> Liquid Limit (%)				Type	Angle internal friction (°)
									0	10	20	30	40	50											
18 OCTOBER 1997	45					GP		43.35 - 45.25 m: GRAVEL, andesitic, subrounded to subangular, diameter up to 8.00 CM.																	
	46							45.25 - 50.00 m: SAND, grey to dark grey, medium to coarse grained, well graded, very dense, some amount of GRAVEL with diameter up to 5.00 cm (derived from highly weathered volcanic breccia.																	
	47					SW																			
	48																								
	49																								
	50				50.00		14.15																		
	51									BOTTOM OF HOLE															
	52																								
	53																								
	54																								
	55																								
56																									
57																									
58																									
59																									
60																									

LEGEND: S.P.T. V.D.S.



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BORING LOG

Bore Hole : SB - 1	Sheet : 1 of 2	Ground Water Level (GWL) : meter	Date : 1 - 9 - 1997 to 3 - 9 - 1997
Location : SIMONGAN WEIR - Right bank	Coordinate : x = y =	Drilled by : Yaka Aziz	
Boring Depth : 20.00 meter	Angle : Bearing :	Logged by : Rudy Mulianto	
Elevation : + 8.602 meter	Drilling Machine : KOKEN OE - ZL	Supervisor :	

CLASSIFICATION AND DESCRIPTION OF MATERIAL

1	2	3	4	5	6	7	8	9	12					13	14	15	16	17	18	19				20					
									Standard Penetration Test											Geological Strata	Method of Sampling	Specific Gravity	Water Content (%)	Unit Weight (γ _{mo})	Void Ratio, e	Atterberg Limits			
Date	Scale	Elevation	Stratum Thickness	Depth(m)	Soil Profile	Classification	GWL	DESCRIPTION	N-Value Number of Blows per 30 Cm Penetration																				
									0	10	20	30	40	50						0	40	60	120	150					
1 SEPTEMBER 1997	1			1.40		ML		0.00 - 1.40 m: SANDY SILT, light brown to brown, very soft to firm, low plasticity, moist; containing some gravels, subrounded to subangular, diameter up to 7 cm.							22/30														
	2			2.50		ML		1.40 - 2.00 m: CLAYEY SILT, brown, low to medium plasticity, stiff, moist.							21/30														
	3			2.80		CH		2.80 - 5.00 m: SANDY CLAY, light brown, high plasticity, stiff, moist.							24/30														
	4			5.00		CH		5.00 - 5.80 m: SILTY CLAY, light brown to brown, firm, high plasticity, moist.							21/30														
	5			5.80		CH										21/30													
	6			5.80		SW		5.80 - 7.70 m: CLAYEY SAND, grey, medium to coarse grained, well graded, medium dense, moist.								13/30	B												
	7			7.70		SW		7.70 - 10.40 m: GRAVELY SAND, grey with red mottled, medium to coarse grained, well graded, very dense. GRAVELS: diameter up to 4.00 cm.								21/30													
8			10.40		SW	5.65									24/30														
2 SEPTEMBER 1997	9					SW		10.40 - 12.00 m: SAND, grey, coarse to very coarse grained, poorly graded, dense to very dense.							42/30														
	10					SW									65/30														
	11					SP									42/30														
12			12.00				12.00 - 12.50 m: SANDY GRAVEL, grey, subrounded to rounded, diameter up to 6.00 cm.								49/30														
13			12.50		GW										10/30														
14							12.50 - 15.70 m: SAND, grey, fine to medium grained, well graded, wet. Occasionally some gravels with diameter up to 1.50 cm.								11/30														
15																													

LEGEND: COARSE SPT UDS