

shown that, natural moisture is from 12.69% to 19.74%, wet density from 1.863 to 2.182g/cm³, liquid limit is from 17.5% to 26.0%, plasticity index is from 2.4% to 7.6%, (see average value of the physico-mechanical properties - table 5a).

$$\text{Wet density } \gamma_w = 2,001 \text{ g/cm}^3$$

Hydrogeological conditions

At the surveying area, the groundwater level is affected by the tide and changeable according to seasons. The depth of the groundwater level in the boreholes during the investigation time is from -0.5m to -1.5m. (The underground water level measured from ground surface).

AVERAGE VALUE OF PHYSICA - MECHANICAL PROPERTIES Layer 2 : Very soft, high plasticity blackish grey ORGANIC CLAY (OH).

Table :1a

No	Property	Sign	Average value.	Maximum value	Minimum value	Number of test
1	Sieve Analysis, % Passing					
	3/4" (19 mm)					
	1/2" (12.5 mm)					
	3/8" (9.5 mm)					
	#4 (4.75 mm)					
	#8 (2.36 mm)		100.0	100.0	100.0	6
	#16 (1.18 mm)		99.4	100.0	96.3	6
	#30 (0.6 mm)		98.7	100.0	92.1	6
	#50 (0.3 mm)		98.1	100.0	88.5	6
	#100 (0.15 mm)		97.8	100.0	86.7	6
	#200 (0.075 mm)		94.6	98.0	85.1	6
	< 0.005 mm		62.1	78.5	52.8	6
2	Natural moisture content (%)	w	98.10	110.39	88.99	6
3	Natural unit weight (g/cm ³)	γ	1.402	1.461	1.289	6
4	Dry unit weight (g/cm ³)	γ_d	0.709	0.773	0.661	6
5	Specific gravity	G _s	2.562	2.584	2.534	6
6	Porosity	n	0.720	0.740	0.700	6
7	Void ratio	e _o	2.625	2.851	2.343	6
8	Degree saturation (%)	S	95.90	99.30	83.40	6
9	Liquid limit (%)	LL	99.5	107.4	87.5	6
10	Plastic limit (%)	LP	47.5	56.9	40.5	6
11	Plastic index (%)	PI	52.0	58.4	42.1	6
12	Water plasticity ratio (%)	B	0.97	1.13	0.69	6
13	Unconfined compression (Kg/cm ²)	qu	0.105	0.112	0.097	2
14	Compression index (cm ² /kg)	C _c	1.2270	1.2980	1.1560	2
15	Coefficient of consolidation (cm ² /s)	C _v	4.50E-04	6.61E-04	2.38E-04	2
16	Preconsolidation pressure (kg/cm ²)	P _c	0.652	0.676	0.628	2
17	Coefficient of volumm compressibility (cm ² /g)	M _v	1.06E-04	1.08E-04	1.05E-04	2
18	Permeability (cm/sec)	k ₂₀	3.09E-08	3.67E-08	2.52E-08	2

AVERAGE VALUE OF PHYSICA - MECHANICAL PROPERTIES
Layer 3 : Soft, high plasticity blackish grey SANDY CLAY (CL).

Table :2a

No	Property	Sign	Average value.	Maximum value	Minimum value	Number of test
1	Sieve Analysis, % Passing					
	3/4" (19 mm)					
	1/2" (12.5 mm)					
	3/8" (9.5 mm)					
	#4 (4.75 mm)					
	#8 (2.36 mm)		100.0			1
	#16 (1.18 mm)		97.3			1
	#30 (0.6 mm)		91.7			1
	#50 (0.3 mm)		79.1			1
	#100 (0.15 mm)		62.0			1
	#200 (0.075 mm)		56.1			1
	< 0.005 mm		36.3			1
2	Natural moisture content (%)	w	28.61			1
3	Natural unit weight (g/cm ³)	γ	1.934			1
4	Dry unit weight (g/cm ³)	γ _d	1.504			1
5	Specific gravity	G _s	2.697			1
6	Porosity	n	0.440			1
7	Void ratio	e _o	0.793			1
8	Degree saturation (%)	S	97.20			1
9	Liquid limit (%)	LL	34.6			1
10	Plastic limit (%)	LP	16.7			1
11	Plastic index (%)	PI	17.9			1
12	Water plasticity ratio (%)	B	0.67			1
13	Unconfined compression (Kg/cm ²)	qu	0.359			1
14	Compression index (cm ² /kg)	C _c	0.3408			1
15	Coefficient of consolidation (cm ² /s)	C _v	5.66E-04			1
16	Preconsolidation pressure (kg/cm ²)	P _c	1.307			1
17	Coefficient of volumm compressibility (cm ² /g)	M _v	5.01E-05			1
18	Permeability (cm/sec)	k ₂₀	2.41E-08			1

AVERAGE VALUE OF PHYSICA - MECHANICAL PROPERTIES
Layer 4b : Medium dense, greenish grey LAYEY SAND (SC).

Table : 3a

No	Property	Sign	Average value.	Maximum value	Minimum value	Number of test
1	Sieve Analysis, % Passing					
	3/4" (19 mm)					
	1/2" (12.5 mm)		99.8	100.0	99.6	2
	3/8" (9.5 mm)		99.2	100.0	98.5	2
	#4 (4.75 mm)		95.2	100.0	90.3	2
	#8 (2.36 mm)		89.8	100.0	79.6	2
	#16 (1.18 mm)		82.4	88.6	76.2	2
	#30 (0.6 mm)		74.6	75.1	74.0	2
	#50 (0.3 mm)		53.7	62.7	44.6	2
	#100 (0.15 mm)		26.1	27.3	24.8	2
	#200 (0.075 mm)		21.6	21.8	21.4	2
	< 0.005 mm		10.8	12.6	9.0	2
2	Natural moisture content (%)	w	20.60	21.80	19.40	2
3	Natural unit weight (g/cm ³)	γ	2.000	2.068	1.932	2
4	Dry unit weight (g/cm ³)	γ _d	1.659	1.732	1.586	2
5	Specific gravity	G _s	2.631	2.639	2.623	2
6	Porosity	n	0.370	0.400	0.340	2
7	Void ratio	e _o	0.589	0.654	0.524	2
8	Degree saturation (%)	S	92.60	97.80	87.50	2
9	Liquid limit (%)	LL	24.0	27.2	20.8	2
10	Plastic limit (%)	LP	16.4	19.2	13.6	2
11	Plastic index (%)	PI	7.6	8.0	7.2	2
12	Water plasticity ratio (%)	B	0.57	0.81	0.33	2
13	Unconfined compression (Kg/cm ²)	qu				
14	Compression index (cm ² /kg)	C _c				
15	Coefficient of consolidation (cm ² /s)	C _v				
16	Preconsolidation pressure (kg/cm ²)	P _c				
17	Coefficient of volumm compressibility (cm ² /g)	M _v				
18	Permeability (cm/sec)	k ₂₀				