

AVERAGE VALUE OF PHYSICA - MECHANICAL PROPERTIES
Layer 4a : Stiff, high plasticity, brownish grey CLAY (CH)

Table: 3

No	Properties	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	2
	#16 (1.18 mm)		97.4	99.5	95.2	2
	#30 (0.6 mm)		95.6	98.8	92.3	2
	#50 (0.3 mm)		90.2	98.0	82.4	2
	#100 (0.15 mm)		88.5	96.3	80.6	2
	#200 (0.075 mm)		76.6	89.2	63.9	2
	< 0.005 mm		41.7	46.7	42.7	2
2	Natural moisture content (%)	w	22.75	24.81	20.69	2
3	Natural unit weight (g/cm ³)	γ	2.016	2.081	1.950	2
4	Dry unit weight (g/cm ³)	γ_d	1.643	1.724	1.562	2
5	Specific gravity	G _s	2.706	2.710	2.701	2
6	Porosity	n	0.390	0.420	0.360	2
7	Void ratio	e _v	0.651	0.735	0.566	2
8	Degree saturation (%)	S	95.10	98.70	91.50	2
9	Liquid limit (%)	LL	53.5	56.5	50.5	2
10	Plastic limit (%)	LP	24.0	24.8	23.2	2
11	Plastic index (%)	PI	29.5	31.7	27.3	2
12	Water plasticity ratio (%)	B	-0.04	0.06	-0.13	2
13	Unconfined compression (Kg/cm ²)	qu	0.806	0.846	0.766	2
14	Compression index (cm ² /kg)	C _c	0.1285			1
15	Coefficient of consolidation (cm ² /s)	C _v	9.97E-04			1
16	Preconsolidation pressure (kg/cm ²)	P _c	1.696			1
17	Coefficient of volum compressibility (cm ² /g)	M _v	1.99E-05			1
18	Permeability (cm/sec)	k ₂₀	1.30E-08			1

AVERAGE VALUE OF PHYSICA - MECHANICAL PROPERTIES
Layer 4b : Loose, whitish grey CLAYEY SAND (SC)

Table: 4

No	Properties	Sign	Average value.	Maximum value	Minimum value	Number of test
1	Sieve Analysis, % Passing					
	3/4" (19 mm)		100.0	100.0	100.0	22
	1/2" (12.5 mm)		99.6	100.0	93.8	22
	3/8" (9.5 mm)		99.2	100.0	88.0	22
	#4 (4.75 mm)		98.1	100.0	78.5	22
	#8 (2.36 mm)		96.9	100.0	52.8	22
	#16 (1.18 mm)		92.9	99.9	46.8	22
	#30 (0.6 mm)		83.2	99.8	33.6	22
	#50 (0.3 mm)		61.5	94.8	24.9	22
	#100 (0.15 mm)		32.9	45.2	22.5	22
	#200 (0.075 mm)		27.4	40.4	20.0	22
	< 0.005 mm		13.4	28.0	5.8	22
2	Natural moisture content (%)	w	17.68	21.65	14.54	22
3	Natural unit weight (g/cm ³)	γ	2.079	2.168	1.930	22
4	Dry unit weight (g/cm ³)	γ_d	1.767	1.877	1.641	22
5	Specific gravity	G _s	2.657	2.716	2.641	22
6	Porosity	n	0.330	0.380	0.290	22
7	Void ratio	e _v	0.505	0.622	0.410	22
8	Degree saturation (%)	S	93.30	99.90	75.30	22
9	Liquid limit (%)	LL	25.4	61.6	17.9	22
10	Plastic limit (%)	LP	16.5	28.8	12.7	22
11	Plastic index (%)	PI	8.9	32.8	4.1	22
12	Water plasticity ratio (%)	B	0.34	1.06	-0.37	22
13	Unconfined compression (Kg/cm ²)	qu	0.774	2.111	0.228	10
14	Compression index (cm ² /kg)	C _c	0.1390	0.2190	0.0860	8
15	Coefficient of consolidation (cm ² /s)	C _v	8.21E-04	1.14E-03	5.50E-04	8
16	Preconsolidation pressure (kg/cm ²)	P _c	1.093	1.747	0.475	8
17	Coefficient of volum compressibility (cm ² /g)	M _v	3.52E-05	4.63E-05	1.66E-05	8
18	Permeability (cm/sec)	k ₂₀	2.57E-08	4.31E-08	1.49E-08	8

AVERAGE VALUE OF PHYSICA - MECHANICAL PROPERTIES
Layer 4d : Medium dense, yellowish grey SILTY SAND (SM)

Table: 6

No	Properties	Sign	Average value.	Maximum value	Minimum value	Number of test
1	Sieve Analysis, % Passing-					
	3/4" (19 mm)		100.0	100.0	100.0	29
	1/2" (12.5 mm)		99.9	100.0	98.8	29
	3/8" (9.5 mm)		99.8	100.0	97.7	29
	#4 (4.75 mm)		99.7	100.0	94.9	29
	#8 (2.36 mm)		99.1	100.0	81.8	29
	#16 (1.18 mm)		93.1	99.9	72.3	29
	#30 (0.6 mm)		82.3	99.5	44.5	29
	#50 (0.3 mm)		54.4	90.8	23.6	29
	#100 (0.15 mm)		25.3	38.9	13.9	29
	#200 (0.075 mm)		19.5	30.3	11.1	29
	< 0.005 mm		7.1	15.6	3.1	29
2	Natural moisture content (%)	w	15.64	19.39	11.42	29
3	Natural unit weight (g/cm ³)	γ	2.088	2.190	1.892	29
4	Dry unit weight (g/cm ³)	γ_d	1.807	1.954	1.600	29
5	Specific gravity	Gs	2.644	2.667	2.633	29
6	Porosity	n	0.320	0.400	0.270	29
7	Void ratio	e_o	0.466	0.655	0.365	29
8	Degree saturation (%)	S	89.20	99.80	71.00	29
9	Liquid limit (%)	LL	18.9	22.1	15.3	22
10	Plastic limit (%)	LP	14.3	17.3	11.2	22
11	Plastic index (%)	PI	4.6	6.4	2.4	22
12	Water plasticity ratio (%)	B	0.30	1.16	-1.45	22
13	Unconfined compression (Kg/cm ²)	qu	0.255	0.279	0.230	2
14	Compression index (cm ² /kg)	Cc	0.1010	0.1070	0.0960	2
15	Coefficient of consolidation (cm ² /s)	Cv	8.98E-04	1.12E-03	6.74E-04	2
16	Preconsolidation pressure (kg/cm ²)	Pc	0.873	1.070	0.676	2
17	Coefficient of volum compressibility (cm ² /g)	Mv	3.05E-05	3.77E-05	2.41E-05	2
18	Permeability (cm/sec)	k20	2.51E-08	2.91E-08	2.11E-08	2
19	Cohesion (kg/cm ²)	Cd	0.031	0.031	0.031	2
20	Angle of internal friction (°)	ϕ_d	32° 37'	33° 04'	32° 10'	2

AVERAGE VALUE OF PHYSICA - MECHANICAL PROPERTIES
Layer 4c : Medium dense, yellowish grey POORLY GRADED SAND with SILT (SP-SM)

Table: 5

No	Properties	Sign	Average value.	Maximum value	Minimum value	Number of test
1	Sieve Analysis, % Passing					
	3/4" (19 mm)		100.0			1
	1/2" (12.5 mm)		99.3			1
	3/8" (9.5 mm)		98.9			1
	#4 (4.75 mm)		98.3			1
	#8 (2.36 mm)		93.7			1
	#16 (1.18 mm)		56.6			1
	#30 (0.6 mm)		27.2			1
	#50 (0.3 mm)		16.5			1
	#100 (0.15 mm)		10.8			1
	#200 (0.075 mm)		8.8			1
	< 0.005 mm		4.2			1
2	Natural moisture content (%)	w	10.16			1
3	Natural unit weight (g/cm ³)	γ	2.135			1
4	Dry unit weight (g/cm ³)	γ_d	1.938			1
5	Specific gravity	Gs	2.642			1
6	Porosity	n	0.270			1
7	Void ratio	e_o	0.363			1
8	Degree saturation (%)	S	73.90			1
9	Liquid limit (%)	LL				
10	Plastic limit (%)	LP				
11	Plastic index (%)	PI				
12	Water plasticity ratio (%)	B				
13	Unconfined compression (Kg/cm ²)	qu				
14	Compression index (cm ² /kg)	Cc				
15	Coefficient of consolidation (cm ² /s)	Cv				
16	Preconsolidation pressure (kg/cm ²)	Pc				
17	Coefficient of volum compressibility (cm ² /g)	Mv				
18	Permeability (cm/sec)	k20				