



II. ANALYSIS OF THE INVESTIGATION RESULT

A. THANH DA DRAINAGE STATION

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1 . STRUCTURE OF THE BASE SOIL.

Based on in-situ survey, drilling documents and the results obtained from the soil tests, we have noticed that basic soil on the surveying site (up to 30.0m deep) was composed by Holocene deposits of 21.5m thick and Pleistocene deposits, which the thickness has not been determined yet (boreholes of 30.0m depth did not excess these deposits), and on the surface there is made ground on the surface with the thickness 1.5m. From the surface downwards there are the following layers:

1.1 . Layer 1: Made ground - Soft, blackish grey SANDY CLAY

This layer lies right on the surface found at all boreholes, with the thickness 1.5m.

1.2 . Layer 2: Very soft, high plasticity blackish grey ORGANIC CLAY (OH).

It is covered by layer 1 with thickness from 17.0m (UT-02) to 17.5m (UT-01) and the bottom is from 17.5m (UT-01) to 18.0m (UT-02) deep. Standard penetration resistance N from 0 to 1. In total, 25 samples were taken from this layer, the obtained physico-mechanical properties of the samples have shown that, natural moisture is from 66.50% to 105.59%, wet density from 1.366 to 1.541g/cm³, liquid limit from 53.2 to 96.3%, plasticity index from 22.8 to 48.4%, high compressibility (see average value of the physico-mechanical properties - table 1a). The main characteristics of the layer are as follows :

Wet density	γ_w	=	1,435 g/cm ³
Unconfined compressive strength	q_u	=	0.121 Kg/cm ²
Compression index	C_c	=	1.121
Coefficient of consolidation	C_v	=	2.21 x 10 ⁻⁴
Coefficient of volume compressibility	mv	=	1.35 x 10 ⁻⁴

1.3 . Layer 3: Very loose, blackish grey CLAYEY SAND (SC).

Was found only at borehole UT-01. Thickness is 4.0m and the bottom of layer is 23.0m deep. Standard penetration resistance $N = 1$. In total, 2 samples were taken from this layer, the obtained physical, mechanical properties of the samples have shown that, natural moisture is from 20.96% to 23.73%, wet density from 1.946 to 1.949g/cm³, liquid limit from 20.8 to 21.6%, plasticity index from 7.5 to 7.7% (see average value of the physico-mechanical properties - table 2a). The main characteristics of the layer are as follows :

Wet density	γ_w	=	1,948 g/cm ³
Unconfined compressive UTrength	q_u	=	0.111 Kg/cm ²

1.4 . Layer 3a: Loose, greenish grey SILTY, CLAYEY SAND (SM-SC).

Was found only at the borehole UT-02. The thickness is 3.5m and the depth of the layer bottom is 22.0m. Standard penetration resistance from 2 to 4. In total, 2 samples were taken from this layer, the obtained physico-mechanical properties of the samples have shown that, natural moisture is from 19.81% to 20.21%, wet density from 2.051 to 2.080g/cm³, liquid limit 24.7%, plasticity index is 6.8%, (see average value of the physico-mechanical properties - table 3a). The main characteristics of the layer are as follows :

Wet density	γ_w	=	1,721 g/cm ³
Unconfined compressive strength	q_u	=	0.336 Kg/cm ²
Compression index	C_c	=	0.0785
Coefficient of consolidation	C_v	=	7.15 x 10 ⁻⁴
Coefficient of volume compressibility	mv	=	2.42 x 10 ⁻⁵

1.5 . Layer 4: Stiff, very stiff, green, brownish grey CLAY with SAND (CL)

Was found at all the boreholes. The thickness is more 8.0m and the depth of the layer bottom is more 30.0m. At the boreholes with 30.0m depth, its thickness has not been determined yet. Standard penetration resistance from 11 to 24. In total, 8 samples were taken from this layer, the obtained physico-mechanical properties of the samples have shown that, natural moisture is from 15.90% to 22.92%, wet density from 1.950 to 2.170g/cm³, liquid limit is from 26.9% to 40.4%, plasticity index is from 10.6% to 20.9%, (see average value of the physico-mechanical properties - table 4a).

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 (UT-02) to 1.0m (UT-01).