

Numerical Evaluation of Settlements Versus Thickness of Surface Non-Liquefiable Layer in Urayasu city

○Ge ZHOU, Tetsuo TOBITA, Mamoru MIMURA

Although much methods of evaluating the liquefaction-induced settlements subjected to earthquake shaking have been proposed, accurate and simplified prediction of liquefaction-related phenomena remains a challenge. In this study, a method of numerical analysis is proposed to predict the amount of liquefaction-induced settlement under seismic loading in the deposit including liquefiable layer and non-liquefiable layer. The prediction results were compared with the known settlements observed at two sites of Urayasu City. It was shown that the proposed methodology may be used for predicting liquefaction-related settlements with a certain level of accuracy. By examining a bulk of numerical simulation tests data on the different ratio of the surface non-liquefiable layer thickness to the underneath liquefiable layer thickness, a family of curves was presented in which the settlement is correlated with the layer ratio, the peak acceleration of input seismic wave, the SPT-N value reflected the density of the sand deposit and the factor about the

liquefiable degree. It is suggested that the deposit ratio have a primary effect on the liquefaction-induced settlements. The equation is presented for estimating settlements using these parameters, and the results are shown as compared favorably with settlements observed at some sites for which good data on settlements have been observed.

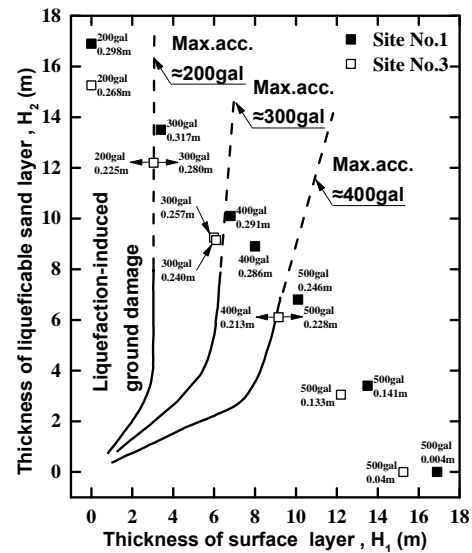


Fig. 2 Computed settlements and the chart by Ishihara (1985)

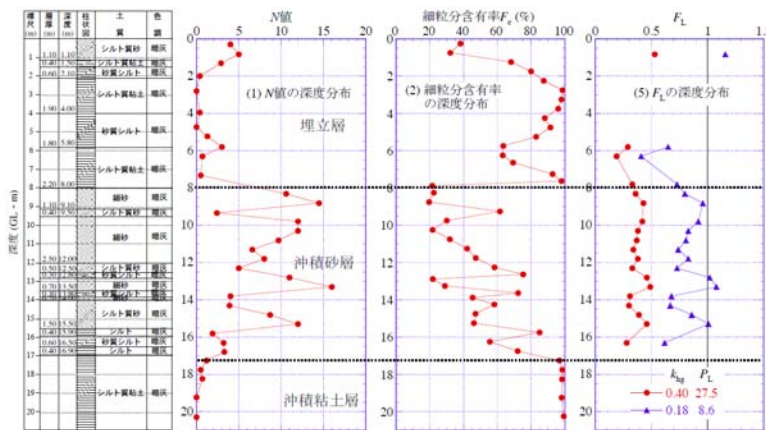


図-5 地点1の土質柱状図とN値, F_6 値, F_L 値の深度分布

Fig. 1 Borehole profile of Urayasu, Site No.1