

Simplified Empirical Method for Predicting Liquefaction Potential and Its Application to Kaohsiung Areas in Taiwan

Authors : Darn H. Hsiao, Zhu-Yun Zheng

Abstract : Since Taiwan is located between the Eurasian and Filipino plates and earthquakes often thus occur. The coastal plains in western Taiwan are alluvial plains, and the soils of the alluvium are mostly from the Lao-Shan belt in the central mountainous area of southern Taiwan. It could come mostly from sand/shale and slate. The previous investigation found that the soils in the Kaohsiung area of southern Taiwan are mainly composed of slate, shale, quartz, low-plastic clay, silt, silty sand and so on. It can also be found from the past earthquakes that the soil in Kaohsiung is highly susceptible to soil subsidence due to liquefaction. Insufficient bearing capacity of building will cause soil liquefaction disasters. In this study, the boring drilling data from nine districts among the Love River Basin in the city center, and some factors affecting liquefaction include the content of fines (FC), standard penetration test N value (SPT N), the thickness of clay layer near ground-surface, and the thickness of possible liquefied soil were further discussed for liquefaction potential as well as groundwater level. The results show that the liquefaction potential is higher in the areas near the riverside, the backfill area, and the west area of the study area. This paper also uses the old paleo-geological map, soil particle distribution curve, compared with LPI map calculated from the analysis results. After all the parameters finally were studied for five sub zones in the Love River Basin by maximum-minimum method, it is found that both of standard penetration test N value and the thickness of the clay layer will be most influential.

Keywords : liquefaction, western Taiwan, liquefaction potential map, high liquefaction potential areas

Conference Title : ICCEGE 2019 : International Conference on Civil Engineering and Geotechnical Engineering

Conference Location : Rome, Italy

Conference Dates : July 22-23, 2019