ABSTRACT

The consolidation settlement of compressible soils is known to comprise of two parts, which are the primary and the secondary consolidation. These consolidations do not take place simultaneously, the primary consolidation will occur first, and the secondary consolidation will follow afterwards. While the primary consolidation represents a compression of soil that also causes dissipation of the pore water pressure, the secondary consolidation occurs without any change of pore water pressure and it represents the gradual creep adjustment of the soil matrix due to additional load into the soil.

The parameters for primary consolidation has been well studied by many researchers, for example Kosasih and Mochtar (1997) has suggested an empirical parameters for Compression Index, Cc, and Swelling Index, Cs, which are found to be dependant on Liquid Limits, LL; void ratio, e, and water content, wc. However, very limited study has been performed for the secondary consolidation. It is because in the past the primary consolidation occurs in very long time, generally it takes several decades to hundreds of years to complete, so that it is used to be the most important soil settlement in the field. However, with the advancement on ground improvement technology and the use of vertical drains, the duration of primary consolidation can be very much shortened to merely several weeks to months. Therefore, the secondary consolidation is recently to become more common problem in the field.

In this study, laboratory investigations have been performed and a new formula for secondary consolidation is suggested. The Secondary Compression Index, C’o, is found to be a function of void ratio, e, Liquid Limit, LL, and effective consolidation pressure, P; so that the suggested formula is as follow:

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C'_{o}/P_i' = 0.013 \ e_{oi} - 0.000062 \ LL - 0.003
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Key words: secondary consolidation, secondary compression index, clay soils.