

VARIATION OF COEFFICIENT OF CONSOLIDATION OF KAMERO, KALO AND RATO MATO OF NEPAL

Abstract— Consolidation is the gradual reduction in volume of a fully saturated soil of low permeability due to drainage of some of the pore water, the process continuing until the excess pore water pressure set up by an increase in total stress has completely dissipated. The application of load to a soil creates a state of excess pore pressure. These excess pore pressures dissipate by the gradual movement of water through the voids of the soil, and this results in a volume change that is time dependent. A soil experiencing such a volume change is said to be consolidating, and the vertical component of the volume change is called consolidation settlement. Laboratory test show that the coefficient of consolidation is varied during the loading and consolidation process. It is known that consolidation process is accompanied by decrease in void ratio which leads to decrease in the coefficient of permeability. The importance of the decrease of the coefficient of consolidation on the time rate of settlement and pore water pressure needs to be investigated. Undisturbed and remolded samples were collected from three different sites. The samples thus collected were preserved and tested in CMTL and Geotech and Associates lab. The lab test includes (Index properties test, Organic content test, Consolidation test and XRD tests). The soils under study are major deposit in Kathmandu, Kaski and Nawalparasi districts, so due to booming construction it is necessary to study its changing consolidation and permeability characteristics and thus predict its settlement rate and life of structure. For kamero and kalo mato it is seen significant change in coefficient of consolidation which is 47.5% and 53% respectively within a period of 3 months at constant consolidation pressure of 57.586 ton/m². Similarly for rato mato the change is 71.79% in a period of 9 months. Hence, it can be concluded that the effect of decrease in void ratio at later time of consolidation leads to decrease in coefficient of consolidation. Variation in C_v misleads in predicting actual settlement of the structure. A detailed study is must to find change in C_v of different soil at different consolidation pressure.

Keywords—*Consolidation, Permeability, XRD*