

ABSTRACT

LOADING AND UNLOADING BEHAVIOR OF CLAY SOIL SUBSTITUTED WITH ROUGH GRADATION MATERIAL (SAND)

By
VENY ANDAR SAPUTRA

Soil functions as weight supporter for any construction above the soil, so that the strength of a structure/construction is also influenced by conditions of soil. Clay soil is one types of soil can be used as embankment. A construction build on the clay soil will result in pore water pressure, and when clay soil has load on it, the clay soil will undergo surface subsidence (consolidation) that cause damage on the construction.

Soil in the field in a certain depth had undergone maximum effective pressure because of soil weight above it (a maximum effective overburden pressure) in its geological history. This maximum effective overburden pressure may be equal to or less than overburden pressure when the clay soil sample was taken. When the clay soil sample was taken, it was released from its overburden pressure so that the sample will expand. When consolidation test was conducted on the sample, a small compression, the change of small pore value, will occur when total load given in the experiment is less than maximum effective overburden pressure the sample ever underwent. When the total burden given at the experiment is bigger than the maximum effective overburden pressure it had ever undergone, the change of pore value will be bigger.

This condition was proven in the laboratory by loading the soil sample more than its maximum effective overburden pressure and then the load was unloaded, and then reloaded again. In addition, the weight loading one soil surface may cause the soil layer beneath the surface to compress. This compression is caused by soil particle deformation, particle relocation, water or air escape from the soil pores and by other causes. Some or all of the factors have correlations with real soil conditions.

Keywords : loading, unloading, clay soil, soil surface subsidence