

Methods of Estimating Pore Pressure in Unsaturated Peat

by

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Abstract

The compressibility of pore water and soil particles in saturated soils is very low in comparison to that of the soil skeleton . Thus, an increment of stress applied to saturated soils is carried by the pore water and the pore pressure parameter B is equal to one. However, the high compressibility of fibrous peat formed by the decay of plants may result in a small parameter B value as there is a gas in the fibrous peat. The applied stress increment is carried partly by the pore water and the soil skeleton as the effective stress even under undrained conditions. This paper describes the application of finite element analysis to the interpretation of the undrained behavior of peat composed of highly compressible fibrous matter. The authors demonstrate how the bulk modulus of the fibrous matter can be determined from oedometer test and triaxial undrained compression tests on peat. It is also shown by finite element analysis that the excess pore pressure induced in peat is characterized by the ratio of the bulk modulus of the fibrous matter to that of soil skeleton. The validity of the analysis is examined by a limited number of comparisons between measured and calculated undrained behaviors of peat.

Keywords: peat, pore pressure, effective stress, finite element analysis

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