

The Small Strain Effects to the Shear Strength and Maximum Stiffness of Post-Cyclic Degradation of Hemic Peat Soil

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Abstract : The laboratory tests for measuring the effects of small strain to the shear strength and maximum stiffness development of post-cyclic degradation of hemic peat are reviewed in this paper. A series of laboratory testing has been conducted to fulfil the objective of this research to study the post-cyclic behaviour of peat soil and focuses on the small strain characteristics. For this purpose, a number of strain-controlled static, cyclic and post-cyclic triaxial tests were carried out in undrained condition on hemic peat soil. The shear strength and maximum stiffness of hemic peat are evaluated immediately after post-cyclic monotonic testing. There are two soil samples taken from West Johor and East Malaysia peat soil. Based on these laboratories and field testing data, it was found that the shear strength and maximum stiffness of peat soil decreased in post-cyclic monotonic loading than its initial shear strength and stiffness. In particular, degradation in shear strength and stiffness is more sensitive for peat soil due to fragile and uniform fibre structures. Shear strength of peat soil, $\tau_{max} = 12.53$ kPa (Beaufort peat, BFpt) and 36.61 kPa (Parit Nipah peat, PNpt) decreased than its initial 58.46 kPa and 91.67 kPa. The maximum stiffness, $G_{max} = 0.23$ and 0.25 decreased markedly with post-cyclic, $G_{max} = 0.04$ and 0.09. Simple correlations between the G_{max} and the τ_{max} effects due to small strain, $\epsilon = 0.1$, the G_{max} values for post-cyclic are relatively low compared to its initial G_{max} . As a consequence, the reported values and patterns of both the West Johor and East Malaysia peat soil are generally the same.

Keywords : post-cyclic, strain, maximum stiffness, shear strength

Conference Title : ICCET 2017 : International Conference on Civil Engineering Technologies

Conference Location : Istanbul, Türkiye

Conference Dates : September 28-29, 2017