

Post-cyclic loading relationship effects to the shear stress and cyclic shear strain of peat soil

ABSTRACT

Peats originate from plants and denote the various stages in the humification process. This condition renders the peat extremely soft and can be considered problematic soil. Thus, this study is conducted to examine and comprehend the particularities of peat engineering behaviour in respect to the relationship effects to the shear stress and cyclic shear strain of peat soil various characteristics to establish suitable correlation. This study carried out by using triaxial testing described by geotechnical test standards BS-1377: Part 8: 1990. Methods of Testing Soils for Civil Engineering Purposes: Shear Strength Tests (Effective Stress) that required for consolidated undrained and consist of five main stages: saturation, consolidation, static, dynamic, and post-cyclic loading using the GDS Enterprise Level Dynamic Triaxial Testing System (ELDYN). The parameters of shear strength were obtained in the peak deviator stress at a maximum of 20% of axial strain by using an undisturbed sample with an effective pressure imposed of 25, 50, and 100 kPa. In this study, all specimens are subjected to cyclic loading up to 100 cycles based on a one-way loading system with strain-controlled conditions. Based on the analysis conveyed, the post-cyclic shear stress decreased compared to its initial value of about 65.56 kPa (PNpt-100 kPa) in static and decreased to 14.9616 kPa in post-cyclic (PNpt-25 kPa-1 Hz). The principal stress ratio (σ'_1/σ'_3) shows the maximum values of this ratio that are located in the narrow zone of 1.61 to 1.12.