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Effect of Time on Dynamic Shear Modulus of Selected Cohesive Soil of One Section of Express Way No. S2 in Warsaw

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A b s t r a c t

Several researches published comprehensive reports on dynamic soil properties of cohesive soils, in which many of them outlined, *i.e.*, key factors affecting the dynamic shear modulus. For cohesive soils, the modulus at small strains ($\gamma < 10^{-3}$ %) is, first of all, a function of void ratio and effective confining stress. For clays, however, secondary time effects and clay mineralogy (fabric and structure) also appear to be important. The influence of confinement of laboratory-prepared as well as naturally deposited clays consists in an increase of shear modulus logarithmically as a function of time. In this paper, the effect of duration of the various confining pressures on dynamic shear modulus (G) of selected cohesive soils from Warsaw area was evaluated. Shear modulus was determined on the basis of resonant column tests, at low and high shearing strain amplitudes. It is shown that the calculated shear modulus is time-dependent; during approximately first 1000 minutes of consolidation, the moduli increased by almost 50%. Moreover, it is characterized by two phases: an initial one results from primary consolidation and a second one, which occurs after the end of primary consolidation, herein about 16-17 hours, and is called "long-term time effect". This effect was found also for modulus at higher shearing strains ($\gamma > 10^{-3}$ %, *e.g.*, 3×10^{-3} %, 5×10^{-3} %, 8×10^{-3} %, 2×10^{-2} %).

Key words: dynamic shear modulus, time-dependency, cohesive soil.