

Effect of Density on the Shear Modulus and Damping Ratio of Saturated Sand in Small Strain

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Abstract : Dynamic properties of soil in small strains, especially for geotechnical engineers, are important for describing the behavior of soil and estimation of the earth structure deformations and structures, especially significant structures. This paper presents the effect of density on the shear modulus and damping ratio of saturated clean sand at various isotropic confining pressures. For this purpose, the specimens were compared with two different relative densities, loose $D_r = 30\%$ and dense $D_r = 70\%$. Dynamic parameters were attained from a series of consolidated undrained fixed – free type torsional resonant column tests in small strain. Sand No. 161 is selected for this paper. The experiments show that by increasing sand density and confining pressure, the shear modulus increases and the damping ratio decreases.

Keywords : dynamic properties, shear modulus, damping ratio, clean sand, density, confining pressure, resonant column/torsional simple shear, TSS

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