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Effect of Silt Presence on Shear Strength Parameters of Unsaturated Sandy Soils

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Abstract : Direct shear test is widely used in soil mechanics experiment to determine the shear strength parameters of granular soils. For analysis of soil stability problems such as bearing capacity, slope stability and lateral pressure on soil retaining structures, the shear strength parameters must be known well. In the present study, shear strength parameters are determined in silty-sand mixtures. Direct shear tests are performed on 161 Firoozkooh sand with different silt content at a relative density of 70% in three vertical stress of 100, 150, and 200 kPa. Wet tamping method is used for soil sample preparation, and the results include diagrams of shear stress versus shear deformation and sample height changes against shear deformation. Accordingly, in different silt percent, the shear strength parameters of the soil such as internal friction angle and dilation angle are calculated and compared. According to the results, when the sample contains up to 10% silt, peak shear strength and internal friction angle have an upward trend. However, if the sample contains 10% to 50% of silt a downward trend is seen in peak shear strength and internal friction angle.

Keywords : shear strength parameters, direct shear test, silty sand, shear stress, shear deformation
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