

## **An Experimental Investigation in Effect of Confining Stress and Matric Suction on the Mechanical Behavior of Sand with Different Fine Content**

**Authors :** S. Asreazad

**Abstract :** This paper presents the results that the soil volumetric strain and shear strength are closely related to the confining stress and initial matric suction under constant water content testing on the specimens of unsaturated sand with clay and silt fines contents. The silty sand specimens reached their peak strength after a very small axial strain followed by a post-peak softening towards an ultimate value. The post-peak drop in stress increased by an increment of the suction, while there is no peak strength for clayey sand specimens. The clayey sand shows compressibility and possesses ductile stress-strain behaviour. Shear strength increased nonlinearly with respect to matric suction for both soil types. When suction exceeds a certain range, the effect of suction on shear strength increment weakens gradually. Under the same confining stress, the dilatant tendencies in the silty sand increased under lower values of suction and decreased for higher suction values under the same confining stress. However, the amount of contraction increased with increasing initial suction for clayey sand specimens.

**Keywords :** unsaturated soils, silty sand, clayey sand, triaxial test

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