عنوان مقاله:

Investigation on the Swelling characteristics and unsaturated shear strength of expansive soils from Arba Minch in Ethiopia

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خلاصه مقاله:

In Ethiopia, many researches were done on characterizing expansive soils but only a very limited number of studies were conducted on Addis Ababa expansive soil, exists on the unsaturated shear strength behavior. The present study addresses examining expansive soils in Arba Minch – a town in the Rift Valley with great portion of its terrain covered by the same soil but not considered previously. Laboratory-testing program was planned and performed on undisturbed soil samples taken from ۱۰ locations for swelling pressure testing; and among these, one pit was allotted for unsaturated shear strength study. The laboratory test results revealed swelling pressure ranges from ۷۴.۵۳ to ۵۷۱.۲۹ kPa, Plasticity Index from ۴۹ to ۷۷%, Shrinkage Index from ۸۱ to ۱۱۷% and Free Swell from ۹۴.۰ to ۱۶۵.۰%. The results from unsaturated shear strength tests performed with a ۵۰kN modified double wall triaxial machine on an undisturbed sample setting matric suction ۱۰۰ kPa, ۱۵۰ kPa and ۲۰۰kPa for an effective consolidation pressure of ۲۰۰kPa have clearly indicated the saturated case to yield smaller shear strength than the unsaturated one. The maximum deviator stress showed to increase from ۱۰۷.۶۱kPa to ۱۷۴.۳۵kPa with an increase in matric suction but the .shape of the stress-strain diagram remained identical

کلمات کلیدی:

Unsaturated Shear Strength, Expansive Soil, Laboratory Testing, Swelling Behavior