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Investigation on the swelling characteristics and unsaturated shear strength of expansive soils from Arba Minch in Ethiopia**Bantayehu Uba**

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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, exist 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 10 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 74.53 to 571.29 kPa, Plasticity Index from 49 to 77%, Shrinkage Index from 81 to 117% and Free Swell from 94.0 to 165.0%. The results from unsaturated shear strength tests performed with a 50 kN modified double wall triaxial machine on an undisturbed sample setting matric suction 100 kPa, 150 kPa and 200 kPa for an effective consolidation pressure of 200 kPa have clearly indicated the saturated case to yield smaller shear strength than the unsaturated one. The maximum deviator stress showed to increase from 107.61 kPa to 174.35 kPa with an increase in matric suction but the shape of the stress-strain diagram remained identical.

Biography

Bantayehu Uba has received his BSc degree in Civil Engineering and MSc degree in Civil Engineering (Geotechnical Engineering) from Mekelle University and Addis Ababa University, respectively. Presently he is a Lecturer in the Institute of Technology, School of Civil Engineering, Hawassa University. Previously, he has served as part-time Lecturer in Institute of Urban Development Studies, Ethiopian Civil Service University and also as Assistant Lecturer at Civil Engineering Department of Technology Faculty, Arba Minch University, Ethiopia. He has worked with contractor and consulting private firms in road and building construction and design and is serving as a Project Manager at Santamaria Construction PLC.

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