

Experiences from the long-term measurement of soil suction in the field

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Wednesday 23rd June 2021, 4 – 5 pm BST (London time) Online Lecture

Abstract:

The occurrence of unsaturated soils in the field has been well documented worldwide by measurements of the degree of saturation on samples taken during geotechnical investigations. On the other hand, the suction of unsaturated soils in the field, especially as part of long-term measurements, is documented very rarely and references on the subject are very few and for a limited number of locations around the world. The scarceness of this kind of measurements denies researchers perception of the anticipated suction and its possible loss or retention because of climatic conditions, especially in countries with warm, temperate climate. Soil suction measurements from temporary and permanent stations in Greece and Cyprus are presented in the lecture. Suction was measured by means of porous block sensors installed at several depths from the ground surface down to 2m. Some of these measurements extend over 5 years or more, recording therefore monthly and yearly fluctuations of soil suction. From these -admittedly few- measurements until today, the large magnitude of suction that may occur both during summer and winter in Greece and Cyprus is presented (can reach 3-4 MPa). It is also shown that these suctions may be maintained for very long periods. The suction values measured point to the need for reliable sensors able to measure suction in the order of MPa in regions of similar climatic conditions.

Speaker Bio:



Dr Michael Bardanis is the Director of Laboratory of EDAFOS Engineering Consultants S.A., a geotechnical consultancy based in Athens, Greece. He holds a Diploma in Civil Engineering from the National Technical University of Athens, an MSc in Soil Mechanics from Imperial College, London, and a PhD degree in Unsaturated Soil Mechanics from the National Technical University of Athens. Michael has worked as a geotechnical engineer since 1998 on several demanding projects in Greece, Cyprus and Bulgaria, including large landslide remediation projects, highways, dams and airports. Since 2009 he directs a large commercial soil and rock mechanics laboratory designed and organized by himself. Michael has authored and co-authored 70 papers in journals and conferences, mainly on unsaturated soil mechanics, landslides and the mechanical behaviour of soils. Since 2018 he is a visiting lecturer at Neapolis University Paphos, Cyprus, teaching Engineering Geology, Soil Mechanics, and Foundation Engineering. He has been elected several times on the Executive Committee of the Hellenic Society of Soil Mechanics and Geotechnical Engineering (HSSMGE), serving as its Secretary General between 2015 and 2019, and as its President since 2019. He is the Chairman of the 8th International Conference on Unsaturated Soils to be held on Milos island, Greece, in 2023.

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