Nature of Matric Suction

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Abstract

We attempt to clarify and address three fundamental questions regarding the appropriate use of matric suction in unsaturated soil mechanics: is matric suction a stress variable; is matric suction a stress state variable?; and is matric suction an independent stress state variable? These questions are examined by employing the universally accepted mechanical equilibrium principle, the concept of Representative Elementary Volume (REV), and physical and logical reasoning. It is clarified that matric suction is not stress variable at a typical soil REV, it can be considered as a stress state variable, and an independent stress state variable. We show that the answers to these questions bear important implications on the conceptualization, theorization, and application of unsaturated soil mechanics.

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