

Validation of Existing Index Properties-Based Correlations for Estimating the Soil-Water Characteristic Curve of Fine-Grained Soils

Authors : Karim Kootahi, Seyed Abolhasan Naeini

Abstract : The soil-water characteristic curve (SWCC), which represents the relationship between suction and water content (or degree of saturation), is an important property of unsaturated soils. The conventional method for determining SWCC is through specialized testing procedures. Since these procedures require specialized unsaturated soil testing apparatus and lengthy testing programs, several index properties-based correlations have been developed for estimating the SWCC of fine-grained soils. There are, however, considerable inconsistencies among the published correlations and there is no validation study on the predictive ability of existing correlations. In the present study, all existing index properties-based correlations are evaluated using a high quality worldwide database. The performances of existing correlations are assessed both graphically and quantitatively using statistical measures. The results of the validation indicate that most of the existing correlations provide unacceptable estimates of degree of saturation but the most recent model appears to be promising.

Keywords : SWCC, correlations, index properties, validation

Conference Title : ICGAGT 2019 : International Conference on Geomechanical Analysis and Geomechanical Tests

Conference Location : Dublin, Ireland

Conference Dates : July 29-30, 2019