An Evaluation of Soil Suction Measurements Using the Filter Paper Method and Their Use in Volume Change Prediction

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ABSTRACT

An evaluation of swell prediction utilizing the filter paper test for measurement of soil suction was conducted in this investigation. Filter paper tests were conducted on four types of clay soils including claystone of the Denver and Pierre Shale Formations, from Colorado, USA, Black Cotton clay from Texas, USA and a sandy clay from Nunn, Colorado, USA. This paper presents the results of the filter paper calibration and measurement of suction values at low water contents for unsaturated soils and their use in predicting volume change. Total oven-dry suction values for the four soil types tested ranged from 6.32 pF to 6.51 pF. The calculation of the suction compression index, Ch, based on an oven-dry suction value of 6.25 pF rather than an oven-dry suction value of 6.4 pF results in an increase in Ch of 19.4% for the Denver formation and 16.0% for the Pierre Shale tested.

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