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# Swelling Characteristics of Compacted, Expansive Soils

N. V. Nayak and R. W. Christensen

Department of Engineering Mechanics, Engineering Building, The University of Wisconsin, Madison, Wisc. 53706

**Abstract:** The limitations of existing methods for the prediction of swelling behavior of compacted soils are examined. Both the purely theoretical approach and the purely empirical approach are found to be inadequate. The present study is based on a semi-empirical approach in which a model of swelling behavior is developed leading to equations relating swelling potential or swelling pressure of a compacted soil to its plasticity index, clay content and initial molding water content. The model is based on the concepts of the diffuse double layer, modified by introducing empirical constants to account for elastic swelling effects and other limitations involved in the direct application of double layer theory to real soils. The empirical constants are evaluated from the results of experimental investigations carried out on a large number of soil samples representing a wide variation of clay content as well as consistency limits.

It is shown that the predicted values of the swelling potential and swelling pressure based on the proposed model agree closely with the experimental results of this study and those reported in the literature. Furthermore, the equations developed in this study are of a more general nature and appear to be applicable to a larger range of soil types than those previously published.

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