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Numerical Modeling of Rammed Earth Using Triaxial Test Data

photograph

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ABSTRACT

This paper presents a series of drained triaxial test data on manually compacted small-scale earth cylinders in order to establish the shear resistance at zero normal stress and the angle of internal friction of this particular application. The data then feed into a two-dimensional finite element model of rammed earth. The model employs the Mohr-Coulomb failure criterion assuming that the shear stress necessary to induce yielding on the failure plane increases as the compressive stress normal to this plane increases. Subsequently, the model is verified by comparing the deformations and failure load predicted using the program with the results obtained from full-scale laboratory tests of rammed earth columns. Finally, the paper proposes possible improvements on the model which is anticipated to be used not as a practical predictive device for rammed earth but as research-design tool to study the effect of physical properties of rammed earth on strength.

KEY WORDS

Rammed Earth, Numerical Modeling, Triaxial Test