

A Constitutive Model for Time-Dependent Behavior of Clay

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Abstract : A new elastic-viscoplastic (EVP) constitutive model is proposed for the analysis of time-dependent behavior of clay. The proposed model is based on the bounding surface plasticity and the concept of viscoplastic consistency framework to establish continuous transition from plasticity to rate dependent viscoplasticity. Unlike the overstress based models, this model will meet the consistency condition in formulating the constitutive equation for EVP model. The procedure of deriving the constitutive relationship is also presented. Simulation results and comparisons with experimental data are then presented to demonstrate the performance of the model.

Keywords : bounding surface, consistency theory, constitutive model, viscosity

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