Determination of a formula for the interpolation of experimental results for determining appropriate starting values for the estimation of the model parameters of the Cam-Clay behavioral model

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Abstract

The Cam-clay model is formulated within the infinitesimal-strain hypothesis in three dimensional spaces. Approach to the reasonable form of cam-clay yield curves does have some needs. One of the most important needs is applying the three dimensional stresses with three different principal values ($\sigma 1 \geq \sigma 2 \geq \sigma 3$) conducting true triaxial compression tests that in most of the countries is not yet available. In addition, in some projects, during the construction of a dam, the principal mechanical parameters of cam-clay model are not evaluated and also the stress–strain curves are not available or even during the construction, this tests have not been done. Fortunately values of cohesion c and friction φ of the soil achieved from the stress–strain curves of common axisymmetric triaxial compression tests are realistic and often available. Angle of internal friction, ϕ is a dominant parameter that employed as a representative characteristic in identification and classification of a soil. In this research, results of triaxial compression tests on different soils are investigated. According to the angle of internal friction, ϕ of the specimens an interpolation has been done. the resulted interpolations give an initial feeling about the value of the principal mechanical parameters of cam-clay model, like λ and κ in three dimensional space of p', q' and υ.

Key words: Interpolation, Cam-Clay, clay core dam, true triaxial compression tests.

1. Introduction

The Cam-Clay model is the first elasto-plastic model that was developed for normal consolidated or slightly over-consolidated fine soils. The results of the Cam-Clay model are almost close to the results of the true triaxial compression test in laboratories. In other side, the core of the clay core rockfill dams is made of clay, hence the cam-clay theory has been widely used for decades as a convenient model for core of rock fill dams.