



Department of Civil Engineering and Engineering Mechanics
Columbia University

Tuesday, January 29, 2013 (2:30~3:30 pm)
644 Mudd

Simulation of Excavation in Soft Cohesive Soils Using An Enhanced Anisotropic Bounding Surface Model



Ching Hung, Ph.D.

Department of Civil Engineering and Engineering Mechanics
Columbia University

(Host: Prof. Hoe I. Ling)

An enhanced anisotropic bounding surface model with non-associative flow rule has been developed for simulating the behavior of different types of cohesive soils, whether strain hardening or strain softening, under general stress paths and drainage conditions. Motivated by the rapid demand of underground space in the urban areas, this study represents the application of such model in non-linear finite element excavation analysis considering a coupling between fluid flow and deformations.

In the first phase of this study, the enhanced anisotropic bounding surface model is integrated with a general purpose geotechnical finite element analysis software PLAXIS. The capability and limitation of the bounding surface models are assessed. Phase two presents the application of bounding surface models for deep excavation analyses. Several case histories in Taipei and Boston are analyzed and compared with field measurements. The analyses have shown satisfactory agreement with the field measurements. The enhanced bounding surface model has demonstrated its potential, together with finite element analysis, in describing the ground response induced by deep excavation.

<http://www.civil.columbia.edu>