



2016-2017

May Meeting Notice

Minnesota Geotechnical Society

Soil Characterization and Modeling of Cut-and-Cover Excavations for a Low-Head Hydroelectric Facility

Mr. Augusto Lucarelli

The conventional Mohr-Coulomb (MC) model is widely used in civil engineering, especially for the prediction of failure phenomena such as slope engineering using the so-called strength reduction method. The MC model uses a constant stiffness for both loading and unloading. If the stiffness is adopted by the initial slope of a stress-strain lab test curve, it will underestimate the deformation before failure. If the stiffness is taken as some averaged stiffness before failure, the unloading-reloading stiffness will not be realistic, which could predict some unrealistic lifting behind the retaining wall after excavation. The Plastic Hardening (PH) model is based on the work of Schanz et al. (1999), which extends the hyperbolic Duncan-Chang non-linear elastic model (Duncan & Chang 1970) to an elastoplastic counterpart to provide better pre-failure stress-strain relation. Different stiffness values are introduced for primary loading and unloading/reloading in the PH model. The yield surface of the PH model is not fixed in the principal stress space, but it can expand due to the increase of the plastic strain, which is termed as plastic hardening.

A calibration procedure based on a series of lab tests and field test will be presented and discussed. Also, a few back analyses case histories will be presented along with a comprehensive design application for a large excavation will be discussed.

Date: Wednesday, May 10th, 2017

Location: Rose Vine Hall (downstairs at Grumpy's Bar & Grill)
2801 Snelling Ave. N., Roseville, MN

Time: 6:00 Social Hour – Sponsored by Itasca Consulting Group

7:00 Dinner – Buffet Style:
Hamburger or Chicken Sandwich buffet with salad and a side. Cookies and Coffee desert. – \$30.00

8:00 Presentation – Mr. Augusto Lucarelli, Plastic Hardening Soil Model
(One professional development hour toward continuing education requirements for Professional Engineers is available).

Cost: 2016-2017 MGS Membership Dues are \$30.
Paid 2016-2017 MGS Members receive a \$5 meeting discount on the meal costs listed above.
The cost for full-time students is \$10, payable to MGS at the door.

Reservations: Requested by noon, Friday, May 5th, 2017

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