Marr to Speak at Earth Retention Conference
Finite Element Analysis as a Design Tool for Excavations

GeoComp President & CEO Dr. W. Allen Marr will be speaking at the August 4th Plenary Session of the Earth Retention Conference 3, ER2010, in Bellevue, Washington, on using finite element analysis as a design tool for excavations.

Design of excavations in urban areas is becoming more complex due to increasing requirements for deeper excavations on poorer sites, tighter limits on allowable displacements, and new methods of construction that extend beyond the experience base used to develop previous design methods. Increasingly, design of the excavation support system (ESS) is controlled by limiting displacements instead of avoiding overstressing of the ESS. This requires a new approach to designing ESS, one that focuses on controlling movements.

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From the Lab
GeoTesting Express Continues to Improve Performance

GeoTesting Express (GTX) is committed to continually improving the level of service to our clients. This is a key part of our quality system. We depend heavily upon feedback from our clients to understand where changes can be made and to determine if there is something still outstanding on the project. One tool we use to obtain our clients’ input is a client satisfaction survey. A link to the survey is e-mailed to our clients upon the completion of each project. Clients are asked to rate our performance during the quoting, testing, reporting and invoicing stages of their project on a scale of “1” through “5” (with “5” meaning “exceeded expectations”). Survey responses are shared among management of GTX and we typically respond to any outstanding items within 24-48 hours of receipt.

We are pleased to report steady improvement over the past three years for many of the survey questions, averaging at least a “4.5” out of a possible “5.0” in several key questions.

Gary Torosian, 978-635-0424, gtt@geotesting.com
Marr to Speak at Earth Retention Conference

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“Designing to limit movements places the design emphasis exactly where it should be: How much movement is allowable? What is the optimal design to keep movements within the allowable values? What mitigation steps are possible if the allowable movements are exceeded?”

To learn the approach to displacement-based design using finite element analysis, be sure to attend ER2010, or purchase the conference proceedings.

For more information, please visit www.er2010.org.


What’s New in Products
On Hydraulic Consolidation

Hydraulic consolidation cells, a.k.a. Rowe-Braden consolidation cells, can be used to carry out a variety of vertical and radial consolidation and permeability tests. A main advantage is that the vertical stress is applied by a water-filled pressurized rubber membrane in contact with the top of the test specimen. Therefore, large diameter soil samples can be tested without the use of dead weights, mechanical or pneumatic loading frames or compression machines. The relatively large sample diameter enables the effect of soil fabric (stratigraphy, varves, fissures, bedding planes) on drainage to be examined. Permeability in either vertical or horizontal direction can be reliably determined along with values of void ratio, pore pressure and effective stress to closely simulate field conditions.

Back pressure is applied automatically to the soil sample. The application of back pressure enables field hydraulic gradients to be modeled. Pore pressure is measured at the bottom drain of the test specimen by a transducer in the base of the cell.

Modeling field conditions includes installed drains to increase the rate of consolidation. The installation of sand drains in a soft soil deposit results in radial drainage. A conventional oedometer is limited to vertical drainage. But, a hydraulic cell can be used to study radial consolidation either inward or outward radial or combined. Up to eight drainage conditions can be simulated in this cell.

Also, samples can be back pressure saturated prior to consolidation with excess pore pressures measured during the test.

Currently Geocomp is the only company in the world that manufactures the 151 mm (6.00 in) diameter sample.

For more information, contact Rachid Hankour, at 978-635-0012, or rh@geocomp.com.

Geocomp in the Media

The June 2010 issue of TBM: Tunnel Business Magazine includes a project update on the Kennesaw Pedestrian Underpass, which was covered in our Dec. 2009 issue of Below the Surface. Visit www.geocomp.com and click on News/Events to read the update and find a link to the magazine.
Risk Management at Work
Excavation Monitoring for Georgia Tech’s Dr. G. Wayne Clough Undergraduate Learning Commons

In response to the rapid growth of its student body, Georgia Institute of Technology (Georgia Tech) is adding the Clough Undergraduate Learning Commons (CULC), a 220,000-square-foot facility, to the heart of its Atlanta, Georgia campus. The $85M, five-story building is under construction over an excavation adjacent to the historic Price Gilbert Memorial Library.

Since excavation for the CULC building foundation had to extend below the shallow foundations of the library, the shoring and foundation subcontractor, ABE Enterprises, Inc. required the existing structure and temporary shoring to be monitored during the excavation. ABE chose Geocomp to provide the necessary monitoring services.

Geocomp installed Leica automated motorized total stations (AMTS) with reflective prism targets to monitor the deflection and settlement of the foundation piles and adjacent library building. Data were collected around the clock and fed into Geocomp’s iSiteCentral system, where the ABE team had access to reports of movements recorded during excavation via the web. Geocomp’s real-time performance monitoring included quick notification to site personnel of movement.

In this way, the ABE team was able to manage the risk associated with excavating below existing shallow foundations, and allayed Georgia Tech’s concerns of adjacent building settlement.

For more information, please contact Tom Tye at 770-645-6575 or tye@geocomp.com.

Dr. G. Wayne Clough (2nd from left) at the groundbreaking ceremony.

The new building is named for former Georgia Tech president, Dr. G. Wayne Clough, current Secretary of the Smithsonian Institution. Dr. Clough is an eminent geotechnical engineer who was the first alumnus of Georgia Tech (CE 64’, MS 65’) to serve as its president. The building will feature “modern facilities…refined laboratories, technologically advanced classrooms and interactive learning environments.”* Dr. Clough, known for his emphasis on undergraduate education, was awarded the title of President Emeritus at the groundbreaking ceremony on April 5, 2010.

*Errol B. Davis, Chancellor of the Georgia Board of Regents, in the Technique, April 9, 2010
Geocomp Corporation is a global leader in geo-engineering and has developed some of the most technologically advanced products and solutions available for the geo-engineering field.

Since 1982 Geocomp’s team of experienced engineers and scientists have been solving a broad variety of the world’s most challenging geo-engineering problems on extensive public and private works projects worldwide.

Our areas of specialty include:

- underground engineering for: excavations, tunnels, foundations, landfills, dams and other civil works;
- real-time web-based monitoring; and
- laboratory testing of soils, rock, geosynthetics, concrete and other construction materials.

Geocomp has offices in Massachusetts, New York, Georgia and California and provides solutions to clients worldwide.

Our Consulting, Instrumentation, Testing, and Products divisions provide clients with a comprehensive understanding of underground conditions and potential hazards below the surface to help minimize the risks to worker and public safety, damage to property, delays and additional costs.

Geocomp continues to evolve into a company focused on helping our clients identify and manage risk for the built and natural environments through innovative solutions.