

BELOW THE SURFACE

December 2023

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Danilo Zeppilli Brings Key Offshore Testing Expertise to GTX

Danilo Zeppilli joins us as a Geotechnical Engineer, Laboratory Specialist in the Acton, MA lab as a part of Geocomp and GeoTesting Express. Danilo was born and raised in New Jersey and received his BS and MS in Civil Engineering from Rowan University where he worked as a laboratory technician and studied critical state mechanics. After his masters, Danilo spent time working as a field and lab engineer in Delaware before returning to start his PhD. He was awarded a Chateaubriand research fellowship to work on injection induced earthquakes and finite element modeling in France at École des ponts ParisTech.



Danilo recently defended his PhD in Engineering and Applied Science from the University of Massachusetts Dartmouth where he had been working on offshore wind projects involving problematic soils such as calcareous and glauconite sands. His research included the crushing of hollow calcareous soils due to their weak nature and their transitions from sand to silt behavior. He also worked on the joint industry project "Piling in Glauconite Sand" lead by the Norwegian Geotechnical Institute where variability of particle size distributions and the changes in their plasticity were studied when these green sands are crushed.

With offshore wind expanding rapidly down the east coast of the United States, both of these unique and problematic soils will be encountered more frequently. Understanding how they act in their natural and crushed states will be important to the design and construction of offshore wind farms. With the quantity and quality of testing capabilities in the GeoTesting Express lab as well as working closely with the products and development team of Geocomp, Danilo will help give these special soils the level of attention they deserve and bring client projects to completion at rapid speed. Please join us in welcoming Danilo to our team!

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S-scan Seismic Survey at Coal Ash Sites

Geocomp performed a recent seismic survey using Sercel S-scan technology which showed promising results for characterizing subsurface conditions at a coal ash site in Kentucky. The passive seismic survey was conducted along 8 line arrays up to 2500 feet long across a coal ash dike and adjacent areas.

The S-scan method uses both ambient seismic noise and active seismic sources to estimate shear wave velocity profiles. Results were compared to existing geotechnical data including boring logs, CPT tests, and conventional seismic surveys.

Key findings:

- S-scan detected distinct lower shear wave velocities indicative of soft CCR deposits, especially saturated ash. Values aligned well with measured CPT data.
- Top of the weathered rock was detected at ~1000 ft/sec shear velocity. S-scan indicated more variable rock surface than original subsurface profiles.
- Shear velocities matched reasonably well with CPT correlations, though they tended to be lower than measured values.
- Using appropriate prior information especially for the soft materials provided better resolution between stiff surface layers and deeper soft deposits.

The seismic S-scan method shows promise for improving subsurface characterization and reducing uncertainty at coal ash disposal sites. Additional surveys and analysis will further develop the technique.





Sherman Minton Bridge Emergency Monitoring



Left Image: Sherman Minton Bridge. Right Image: Temporary restraining system installed by the contractor on the bridge.

This fall, Geocomp's expert services were requested to provide urgent instrumentation and monitoring for an emergency repair of the Sherman Minton Bridge in Louisville, KY.

The Sherman Minton Bridge connects Indiana and Kentucky via Interstate 64 over the Ohio River. During recent renovations, the bridge experienced a bearing connection failure causing major distress to the bridge deck. As a result, Kentucky and Indiana Departments of Transportation ordered the bridge to be closed to all traffic in both directions until the bridge deck was moved back into place and a displacement monitoring system was installed. Kentucky DOT referred the bridge contractor to Geocomp to develop and install a monitoring system.

Geocomp used its technologies and expertise to quickly develop a monitoring plan consisting of string potentiometers and tiltmeters to monitor the bearing and the bridge girders. The plan was approved by both DOTs and Geocomp agreed to be "on-call" to install the monitoring system as soon as the repairs were completed.

The contractor installed a temporary restraining system (image above) to hold the bridge deck in place while repair plans were finalized and bearing restraints were fabricated. Geocomp installed the monitoring system ahead of the final repairs to monitor the functionality of the temporary restraining system and allow for I-64 to be re-opened. Real-time monitoring provided through iSiteCentral® allowed the contractor, both DOT's, and the engineer of record to monitor the temporary restraints on the bridge for two weeks before the final repairs were completed on the bearing.

After final repairs to the bearing, Geocomp continued monitoring for one month to determine the repairs were effective and that there were no remaining stability concerns with the newly installed bearing anchors and concrete piers.



New Product Release

New Generation of Constant Rate of Consolidation

Geocomp Products has launched a new CRC (Constant Rate of Consolidation) cell that supports submersible load cells. This new hardware ensures the accurate measurement of excess pore water pressure during the consolidation phase. In addition, the use of a submersible load cell eliminates the adverse effects of piston friction on the measured loads, which is critical in testing soft or sensitive samples where even the slightest loads can impact the test results.

This product allows clients to produce high-quality test results for their production and research projects. It employs multiple advanced closed-loop and adaptive control algorithms to ensure that the rate of strain, stress, or gradient is maintained at the desired level and updated if and when the excess pore pressure ratios are exceeded.

The product is capable of conducting various tests such as Fully Automated Constant Rate of Strain, Constant Rate of Stress, Constant Gradient, and Constant Pore Pressure Ratio Consolidation tests. For more information, please contact Geocomp's Product Division, products@geocomp.com



Happy Holidays

Geocomp/GTX Upcoming Events

[Transportation Research Board \(TRB\)](#) - Washington, DC ~ January 7th

[Future Minerals Forum](#) - Riyadh, Saudi Arabia ~ January 10th

[ASTM D35 Geosynthetics, D18 Soils](#) - Louisville, KY ~ January 24th

[Fox Conference](#) - New York, NY ~ February 7th

[Geo-Congress](#) - Vancouver, Canada ~ February 25th