The Geo-Institute Earth Retaining Structures Technical Committee will live-stream the session "Recent Advances in Earth Retention Technology" on Tuesday, December 5, at 11 AM EST. The topics include:

"Hybrid Reinforced Soil Slope," **Jay McKelvey, III**, P.E., BC.GE, F.ASCE

An existing state highway was required to be widened to provide an entrance lane from a new hospital onto the highway. At the location of the new lane, the existing highway was located at the top of a thirty foot tall embankment inclined at an approximate 1.5H:1V (Horizontal:Vertical) slope. The contract drawings specified temporary shoring to support the highway while the embankment slope was replaced with a geosynthetic reinforced soil slope providing geometry for the new lane. In addition to the significant costs associated with the temporary shoring, a partial lane closure would be needed to perform the work, causing a burden on traffic using the highway. A design alternative was developed featuring installation of high strength wire mesh placed on the existing embankment slope, secured by soil nails. Once the slope mesh was secured to the existing slope, a reinforced soil slope (RSS) would then be constructed with the same high strength wire mesh that would be used for the primary reinforcement. Rather than having reinforcement lengths consistent with the specified geosynthetic reinforcement, the primary reinforcement of the RSS would be rigidly attached to the slope mesh. This webinar presentation will discuss the site constraints, design of the soil nail supported slope mesh, the primary reinforcement and connections, as well as construction of the hybrid RSS.

"Earth Retaining Systems Used for Renovations to the NUH Glenbrook Hospital," **Mike Zimmerman**, E.I.T.

Renovations to the NUH Glenbrook Hospital in Oak Brook, IL required a variety of earth retention systems (ERS) to facilitate excavations next to the existing structure. The temporary earth retention construction was successfully completed in the fall of 2022, with a total of 21,500 sq ft of ERS installed. Keller provided design and installation of H-pile and micropile soldier pile and lagging with both tieback anchors and internally braced solutions depending on access restrictions across the site. During installation, differing conditions were encountered in both the soils and the as-built foundations requiring multiple modifications to the planned ERS.

"Design of Earth Retaining Structures and Levees Considering the Wetting of Unsaturated Clays,"

Meryl Cherchia, P.E., M.ASCE, **Cory Rauss,** E.I.T., and **Shahin Ghazi Zadeh,** Ph.D., P.E.

The design of earth retaining structures and levees along proposed waterways presents an interesting challenge in the presence of unsaturated clays that could be wetted as a result of direct contact with water. The associated loss of shear strength in the unsaturated clays can cause a much higher demand on the retaining walls and levees and a rational approach is needed to develop reasonable estimates for these lower shear strengths. This presentation first outlines the nature of the challenge of designing in the presence of unsaturated clays and then provides an approach to estimating the upper and lower bounds of these shear strengths using the measured shear strengths from the subsurface exploration as the upper bound and the fully saturated undrained shear strength for the lower bound. Principles of unsaturated soil mechanics are then presented, and a methodology is outlined for estimating the time dependence for the unsaturated soils to become fully saturated.