Announcing the Final Examination of Ryan Shamet for the degree of Master of Science

Time & Location: April 6, 2017 at 9:00 AM in Engineering 2 211P
Title: SITE SPECIFIC SINKHOLE RISK ASSESSMENT IN CENTRAL FLORIDA USING CONE PENETRATION TESTING

As Florida’s population is expanding and greater fluctuations in groundwater levels are being recorded, Central Florida has been experiencing a higher frequency of sinkhole occurrences than ever before in recorded history. Sinkholes in Central Florida are formed by a combination of bedrock weathering and overburden soil erosion due to the groundwater recharge and are a part of Florida’s past and future geology. The initial stage of a sinkhole is referred to as soil raveling and is the most effective time to perform soil improvement measures, such as grouting, to mitigate further expansion of a subterranean void. Subsurface exploration tests, commonly implemented by geotechnical engineers for site characterization, have been shown to detect these sinkhole anomalies even when no signs of subsidence are evident on the ground surface. Secondary geophysical testing has also been proven to detect sinkhole raveling anomalies, but at the expense of additional time and money added to the specific project. In this study, current practices in detecting premature sinkholes were expanded upon with a primary focus on Cone Penetrometer testing data (CPT). Cone Penetrometer tests provide valuable high-resolution quantitative information regarding the discrete strength characteristics of relatively loose sandy and clayey subsoil. CPTs are also much quicker and cleaner to perform when compared to other subsurface testing procedures (e.g. Standard penetration tests). Therefore, CPTs were chosen for this study to understand how they can be implemented to assess risk of future sinkhole collapse, or other karst construction concerns, in Central Florida specific soils. By implementing the findings presented in this report, Geotechnical engineers and contractors in central Florida will be able to practically evaluate the size and severity of potential forming sinkhole without the use of additional subsurface geophysical testing. The results of this study hope to eliminate extraneous testing costs, as well as maximize the efficiency of estimating mitigation products and procedures required all while still ensuring a safe design in Central Florida’s highly karst areas.

Major: Civil Engineering

Educational Career:
Bachelor’s of Civil Engineering, BS, 2014, University of Central Florida

Committee in Charge:
Boo Hyun Nam, Chair, Civil Environmental and Construction Engineering
Manoj Chopra, Civil Environmental and Construction Engineering
Dingbao Wang, Civil Environmental and Construction Engineering

Approved for distribution by Boo Hyun Nam, Committee Chair, on March 22, 2017.

The public is welcome to attend.