The magnitude of the overall settlement depends on several variables such as the Compression Index, $C_c$, and Recompression Index, $C_r$, which are determined by a consolidation test; however, the test is time consuming and labor intensive. Correlations have been developed to approximate these compressibility indexes. In this study, a data driven approach has been employed in order to estimate $C_c$ and $C_r$. Support Vector Machines classification is used to determine the number of distinct models to be developed. The statistical models are built through a forward selection stepwise regression procedure. Ten variables were used, including the moisture content ($w$), initial void ratio ($e_0$), dry unit weight ($\gamma_{dry}$), wet unit weight ($\gamma_{wet}$), automatic hammer SPT blow count ($N$), overburden stress ($\sigma$), fines content ($-200$), liquid limit ($LL$), plasticity index ($PI$), and specific gravity ($Gs$). The results confirm the need for separate models for three out of four soil types, these being Coarse Grained, Fine Grained, and Organic Peat. The models for each classification have varying degrees of accuracy. The correlations were tested through a series of field tests, settlement analysis, and comparison to known site settlement. The first analysis incorporates developed correlations for $C_r$, and the second utilizes measured $C_c$ and $C_r$ for each soil layer. The predicted settlements from these two analyses were compared to the measured settlement taken in close proximity. Upon conclusion of the analyses, the results indicate that settlement predictions from measured compressibility index(s) compares more favorably to measured settlement than that of predictions using developed compressibility index(s), with the exception of applying a rule of thumb equating $C_c$ to $C_r$. Accuracy of settlement predictions is contingent on a thorough field investigation.

Major: Civil Engineering

Educational Career:
Bachelor's of Civil Engineering, BS, 2009, University of Florida
Master's of Civil Engineering, MS, 2012, University of Florida

Committee in Charge:
Boo Hyun Nam, Chair, Civil, Environmental, & Construction Engineering
Petros Xanthopoulos, Stetson University
Amr Sallam, Civil, Environmental, & Construction Engineering
Manoj Chopra, Civil, Environmental, & Construction Engineering

Approved for distribution by Boo Hyun Nam, Committee Chair, on June 10, 2018.

The public is welcome to attend.