



Technologies to manage risk for infrastructure

Ellis Square Parking Garage

Geocomp was retained to advise the design-builder after historic buildings surrounding this deep excavation in the center of the city of Savannah, Georgia, began to crack. Geocomp's role was to help determine how to complete the project and help manage the client's risk.

With additional investigations we found extensive soft clay seams below the bottom of the excavation that were not considered in the design of the excavation support system. We worked with the project team to devise a way to complete the 45-ft. deep underground parking structure

with minimal additional movement to adjacent structures.

Geocomp personnel developed the scope of additional subsurface investigations to define and characterize layers of soft clay detected below the bottom of the excavation. These included cone penetration tests, continuous split-spoon, and Shelby tube sampling. Our laboratory completed direct simple shear and constant rate-of-strain consolidation tests to define the appropriate soil properties for analysis of global stability and future deformations. Geocomp also installed a state-of-the-art real-time monitoring system us-



Training targets for AMTS monitoring

ing Leica automated total stations with reflective targets and in-place inclinometers to monitor movements of the excavation support system and adjacent buildings around the clock. This system provided immediate indication of the deformations resulting from specific construction activities and helped identify causes of additional movements to bring them under control.

This project required close integration of Geocomp's expertise in soil properties, advance numerical analysis, real-time monitoring, and risk management to help the client find a way through this serious setback.

Some of the benefits of the program to the project team include:

- Demonstrated to the City the cause of the prior movements and assured them that future movements could be minimized.



Historic buildings within feet of 45-ft. deep excavation

Continued



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Ellis Square Parking Garage, cont'd.

- Increased confidence level of the City and surrounding property owners that work could proceed safely.
- Provided immediate feedback to contractor of any incremental lateral movement of support wall so construction procedures could be adjusted.
- Demonstrated that sand loss during tieback installation was causing additional movements which resulted in changing remedial measures from long tie-backs to soil-cement toe buttresses.
- Demonstrated that soil-cement toe buttress was effective in stopping additional movements.
- Provided hard data to help manage contractor's means and methods to complete the work with minimal additional displacement.