

Client:

Confidential

Location:

Savannah, GA

Services Provided:

- Redesign of foundation
- Real-time monitoring system

Value Provided:

- Real-time performance monitoring provided essential data for assessing deformation during construction

Background & Project Challenges

The original parking garage was built to encourage more shopping in the downtown area. Torn down in 2005, the original garage was replaced by an underground structure and an open public square area. Concern regarding surrounding historical structures required monitoring the excavation area.



Geocomp Role & Accomplishments

Geocomp was retained to advise the design-build team 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 without further damage to the buildings.

With additional investigations, Geocomp found extensive soft clay seams below the bottom of the excavation that were not considered in the design of the excavation support system. Geocomp 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 using 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 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.
- Increased confidence level of the City and surrounding property owners that work could proceed safely.
- 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.