



PROJECT BRIEF

Cox Tower I Instrumentation & Monitoring

PROJECT PROFILE

CLIENT:
ABE Enterprises, Inc.

LOCATION:
Atlanta, GA

VALUE:

- Projected long-term wall movements so final design of permanent wall could incorporate appropriate allowances for future movement

SERVICES PROVIDED:

- Design and installation of instrumentation system and monitoring of support of excavation
- Numerical analysis to predict cause of excessive movements and predict future movements
- Recommend remediation measures to limit wall deformations

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MOVEMENT MONITORING AND WALL STABILIZATION

Geocomp monitored lateral movements and settlement of the excavation support system (ESS), existing parking deck, and road adjacent to the 35' deep excavation. The movement was monitored using a robotic total station and 65 survey prisms. Alerts from Geocomp's iSiteCentral® brought site personnel back in to take remedial measures to stabilize the situation. Geocomp performed a drained and undrained finite element analysis and determined that a large component of the vertical force was ongoing consolidation of the dewatered silt and silt sand. The deformations were further exacerbated by excavations made near the toe of the wall for a tower crane pad, and low factors of safety against global stability. Geocomp used the results from the finite element model to evaluate remedial measures which included installation of a fourth row of tiebacks in one area and installing a row of auger cast piles at the toe of the wall. Geocomp worked with the structural engineer to identify surplus capacity in the foundation auger cast piles and reduce the number of piles required to increase the global stability of the wall.



BACKGROUND

Two 12-story towers for the Cox Technical Expansion in Atlanta, GA required 390' by 420' by 35' deep excavations through saturated residual soils. The support of excavation walls consisted of soldier piles with wood lagging held in place using three rows of tiebacks. Excessive vertical and horizontal deformations were observed and Geocomp was engaged to determine the cause and subsequently recommend remedial actions. The analysis was challenging because of the potential for the clay soils to lose strength over time from drainage. Finite element analyses were performed to evaluate the deformations and factors of safety for various stages of the construction process. Geocomp had to work closely with the building designers and contractor to determine what the future long term deformations might be.