Museum of Fine Arts

Geocomp

Technologies to manage risk for infrastructure

Client:

Schnabel Foundation Company

Location:

Boston, MA

Service Provided:

- Designed, installed and maintained an Automated Data Acquisition System (ADAS) for monitoring of support of excavation

- Numerical analysis to predict forces to design of secant pile wall and cross braces

- Numerical analysis to predict deformations of wall and adjacent museum

Value Provided:

- Assisted client with obtaining design approval for a deep excavation support system located less than 5 feet from a sensitive structure

- Monitored the deformations and loads during construction to reduce risk of unexpected performance

Background & Project Challenges

The extension to the Museum of Fine Arts in Boston required a 33-foot-deep excavation located adjacent to existing museum buildings on two sides. The owner's designer required numerical modeling analysis of the excavation to take into consideration the existing museum foundations loads which are located on one side of the excavation but not the other side. A numerical model was also required to predict deformations and stresses in the support system. The analysis was challenging due to the non-symmetrical loading and the variable stiffness of the Boston Blue Clay which has a significant impact on the deformation prediction.

Geocomp Role & Accomplishments

Geocomp worked with Schnabel Foundation Company on the drafting and response to comments for the support of excavation submittals. Geocomp developed a numerical model of the support of excavation system that incorporated the varying stiffness of the foundations soils, and the loads from the adjacent buildings. The model was used to develop the design loads for the support system, and also to predict the deformation. Geocomp assisted Schnabel Foundation Company with the owner's response to the design and final acceptance of the design.

Geocomp also designed and installed an instrumentation system to monitor the performance of the support system. Readings were taken from an array of vibrating wire strain gages installed on excavation props/struts across the project, and several in-place inclinometer sensor strings. The ADAS was split into *iSite*™ data loggers and a Campbell Scientific CR-10X and the data from both systems were integrated and automatically fed into *iSiteCentral*™ for the project team in near-to real-time.