Geocomp

Technologies to manage risk for infrastructure

Project Brief

Vogtle Nuclear Power Plant Units 3 & 4

Client:

Shaw Constructors, Inc.

Location:

Augusta, GA

Services Provided:

- Monitoring system recommendations for foundation soils
- Procurement, installation, and operation of monitoring systems

Value Provided:

- Monitoring system recommendations alerted and minimized interference of construction activities

Background & Project Challenges

The Vogtle Electric Generating Plant is southeast of Augusta, Georgia. Units 1 and 2 have been in operation for 20 years and produce approximately 2,400 megawatts of electric energy by nuclear power. Units 3 and 4 will more than double the electrical generating capacity of the facility. These will be the first nuclear-powered generating units to be built in the United States in the past 30 years. Each unit requires 90 feet of unacceptable soil to be removed and replaced with 50 feet of compacted structural fill. Approximately 2 million cubic yards of soil must be removed for each unit. Materials below the bottom of the excavation consist of hundreds of feet of alternating layers of clay, silt and sand. The Nuclear Regulatory Commission (NRC) requires field verification of the effective stiffness of these materials to improve the reliability of predictions of settlement of the reactor facilities.

Geocomp Role & Accomplishments

Geocomp assisted the general contractor, in selecting a method to monitor heave of the foundation soils continuously during the removal of the 90 feet of unacceptable soils. The monitoring points would be within the footprint of the excavation and exposed to the intense excavation activities. Requirements for the system were to minimize interference with the excavation activities, monitor heave (from a relative and absolute basis) and settlement continuously during this activity, and provide repeatability of at least $\pm$1.5 mm.

Geocomp recommended a monitoring system consisting of Borros anchors with rods to the surface, and displacement transducers at the top to monitor movement of the anchors relative to the top head for the anchors. The movement of the head would be monitored with a Leica automated total station located outside the excavation footprint. Movement of the total station would be measured by siting to reference prisms located outside the zone of influence of the excavation. In addition, three anchors at different elevations at each of five locations within each unit were installed. Vibrating wire piezometers were installed at each location to monitor pore pressure over time. Geocomp was responsible for procurement, installation and operations of the systems.