

Sequoyah Ringer Crane Foundation Unit #1

Soddy-Daisy, Tennessee

Sequoyah Nuclear Power Plant is owned and operated by the Tennessee Valley Authority (TVA). Unit #1, which began commercial operation in 1981, is one of two pressurized water reactors. Together, the two units can supply enough power to meet the needs of approximately 1.3 million Tennessee Valley homes every day.



The project

Removal and replacement of Steam Generator #1 at the Sequoyah plant required a lift of 360 tons by a large ringer crane. Given that the plant lies in the southeastern part of Tennessee, where much of the area is underlain by karst with possible voids, a foundation system was required to support the circular crane pad.

The challenge

- Difficult subsurface conditions, including underground utilities that traversed the foundation system location.
- Very tight work area within the active power plant.
- No vibrations were permitted during installation.
- High lateral and torsional moments necessitated battered piles.

The solution

Micropiles were selected for the foundation system, with a total of 80, 9.625-in diameters micropiles installed to support the crane foundation for the lift of the old steam generator out of the containment building and placement of the new steam generator back into the structure. The micropiles averaged 65 ft in length, with design loads varying from 360 (static) to 760 kips (seismic). Adjustments to the layout were necessary to accommodate the underground utilities. Most of the piles were battered at an angle of 10 degrees to accommodate lateral and torsional moments. Despite significant challenges imposed by the subsurface conditions, buried utilities, and design changes, the micropiles were installed within schedule and performed as designed.

Project facts

Owner(s)

Tennessee Valley Authority

Keller business unit(s)

Keller

Main contractor(s)

Bechtel Inc.

Solutions

Deep foundations

Markets

Power

Techniques

Micropiles

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