CYNTECH

PSE&G Southern Reinforcement Project

Philadelphia, Pennsylvania

The Southern Reinforcement Project (SRP) was a section of 138 kV lines being upgraded to 230 kV lines, located across the Delaware River from Philadelphia, PA.

The project

Segments 8, IO & 11 of SRP included 35 new structures (H-Frame and Monopoles) which were replaced to accommodate the higher capacity lines. The foundations required to support these larger structures were originally designed as 6–10ft diameter x 20-50ft deep caissons.

The challenge

The scope was awarded to a piling contractor, and while installing their first caisson, the soils were deemed contaminated, and the project adopted a 'no excavation' policy. Cyntech was engaged to provide an alternative using helical piles.

The solution

Cyntech utilized structure specific geotechnical information to recommend the most economical helical configuration for each structure. Pile clusters of 12.75” diameter helical piles were designed with various batters and splays to minimize the pile cap dimensions while avoiding pile group effect. Three test phases were conducted at three locations, each inclusive of an axial compressive, tensile, and lateral load test, in general accordance with ASTM procedures.

The majority of the installations occurred under existing transmission lines. Cyntech designed the fabrication of the piles in both short and long sections, to reduce costs where possible, yet allow for short section installations where required. Adding to the installation restrictions, most of the transmission line was located next to an active railroad right of way, and often the installations occurred between railroad tracks and a state freeway – This greatly reduced the access of installation equipment to install the designed pile batters and splays. Cyntech designed and fabricated a high-capacity U-Joint, which allowed bi-axial movement of the drive head. The installation equipment (45ton excavator) was effectively able to install all piles in a cluster from one location, regardless of batter or splay angle.

The client was able to realize several of the benefits of helical piles – No spoils, the elimination of the handling and disposal costs associated with spoils, and no vibrations during the installation.

- 632 high-capacity helical piles were fabricated and installed
- Pile lengths ranged from 30ft to 60ft
- Production phase spanned 13 weeks
- Custom U-Joint designed and fabricated by Cyntech for excavator
- 3 load tests performed

Project facts

Owner(s)
Public Service Electric & Gas (PSE&G)

Keller business unit(s)
Cyntech Group

Main contractor(s)
N/A

Applications
Helical pile foundations

Markets
Power

Techniques
Helical piles

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