GRL Engineers, Inc.

Scotts Hill Water Tower in Wilmington, NC

Challenge:
The small community of Scotts Hill in Wilmington, North Carolina started seeing rapid development of new housing and road improvements in 2023. With neighboring cities nearly doubling in the last decade, Scotts Hill is beginning to see similar growth and is continuing development to accommodate it. Due to the hundreds of new homes, a water tower was constructed to supplement the community's needs. GRL Engineers was brought onto the project to assess foundation load capacity and determine if the design criteria was met for the new structure.

Method:
The specifications of the project indicated Dynamic Load Testing and Low Strain Integrity Testing to be performed on a sacrificial pile prior to production piles being installed. The required test load was 600 kips and the achieved test load was 1120 kips, nearly 4 times the design load.

Project Details

Client: Goettle

Location: Wilmington, NC

GRL Office: North Carolina

GRL Services

- Low Strain Integrity Testing (PIT)
- APPLE Dynamic Load Testing
- CAPWAP® Analysis

Following the test on the sacrificial pile, Low Strain Integrity Testing was performed on 3 of the 12 augered cast-in-place piles. The average diameter was identified as 18-inches and had a total average length of 48 feet.

Results:
Upon performing the Low Strain Integrity Testing, three of the piles indicated no significant impedance variations, while one of the piles encountered an impedance. The test indicated an increase in impedance near the toe of the pile, which was indicative of an increase in pile volume. The embedment of this pile was significantly greater than the other piles tested. The soil borings indicated a dense layer of weathered limestone starting at a depth of 46 ft below the existing grade, approximately the termination depth of the other tested piles. Thus, this pile is anticipated to be embedded within the limestone.

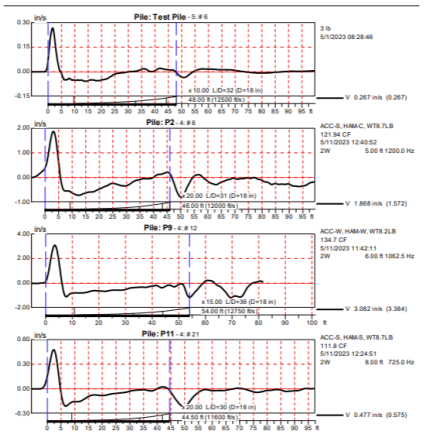

Figure 1. Low Strain Integrity Testing Results Indicate Impedance in Pile 9 at approximately 55 ft.

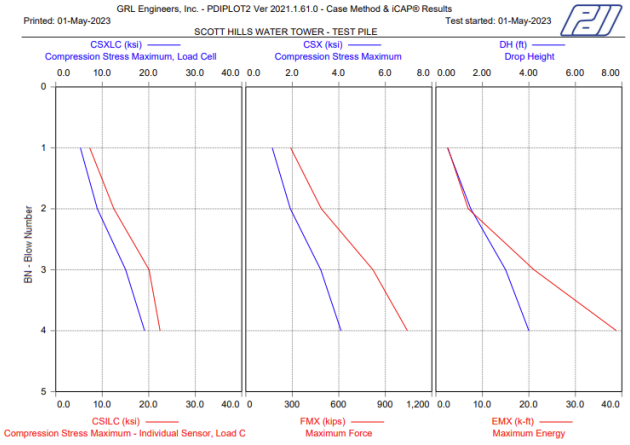

Figure 2. Dynamic Load Testing Results Analyzed with CAPWAP® indicate an achieved test load of 1120 kips on the test pile.

To learn more about GRL Engineers, visit www.grlengineers.com or email us at info@grlengineers.com.