

## St. Francis Hospital Parking Garage Replacement

### Challenge:

The Saint Francis Hospital in Hartford, Connecticut is one of the largest hospital facilities in New England, housing a Level 1 trauma center with 617 beds and is a major teaching hospital. The original facility was constructed in 1885, and a four-level parking garage was constructed in 1983. The project at hand was to completely replace the existing parking garage structure requiring innovative construction due to the age of the foundation and minimal installation records available. GRL Engineers were hired to conduct foundation testing to assess the reuse of viable caissons in the new design.

### Method:

The original caissons consisted of 40, 3-ft diameter and 26, 4.5-ft diameter piles that extended 3.5 ft into bedrock. To determine if the existing caissons were viable, GRL Engineers performed [High Strain Dynamic Load Testing](#) with the GRL APPLE 8 utilizing a 64-kip (32-ton) ram weight. The purpose of the dynamic pile testing was to evaluate mobilized soil resistance and resistance distribution along the embedded shaft lengths. A Pile Driving Analyzer® (PDA) acquired and processed the dynamic test data to meet these objectives. GRL conducted [CAPWAP®](#) analyses to further assess static soil resistance including an estimate of the soil resistance distribution along the shaft and at the shaft base.

### Results:

The axial compressive resistances from the high strain dynamic load tests were verified as 2,000 to 4,500 kips. Once the existing caisson capacities were reported, the designer was able to create a design implementing the existing caissons and supplemental composite piles. Calculated findings of at least \$3 Million was saved, as well as weeks of construction schedule with the composite piles.

To learn more about GRL Engineers, visit [www.grlengineers.com](http://www.grlengineers.com) or email us at [info@grlengineers.com](mailto:info@grlengineers.com).

### Project Details

**Client:** GZA GeoEnvironmental & Keller

**Location:** Hartford, CT

**GRL Office:** Massachusetts

### GRL Services

- High Strain Dynamic Testing with APPLE Systems
- CAPWAP® Analyses

