



## Aloft Hotel Parking Garage

Savannah, GA

**The Geopier X1® system offered construction flexibility and cost savings, while providing increased bearing capacity and control of settlements.**

**Description:** Construction consisted of a 7-story parking garage with a footprint of 16,500 square feet. Design foundation loads are up to 963 kips for column foundations and 47.6 kips per linear feet for wall foundations, and also included 1,200 kips of uplift at footings.

**Subsurface Conditions:** The subsurface conditions consisted of loose to medium dense sand, silty sand to a depth of about 22 feet followed by dense sand to a depth of 35 feet underlain by medium dense sand, silty sand and hard sandy silt to the maximum explored depth of 93 feet. Groundwater was encountered at a depth of 15 to 16 feet.

**Geopier Solution:** The site is located in historic downtown Savannah, surrounded by several historic buildings sensitive to vibrations and within 8 feet of the shallow foundations of an adjacent structure. Geopier's Rammed Aggregate Pier® (RAP) systems were selected as an alternative to augercast piles, vibro-replacement columns and helical piles to support the high compressive loads.



Over 275 Geopier X1® piers (including 40 uplift piers) were constructed using sand backfill in 10 working days. This method provided cost-effective settlement control and an allowable bearing pressure of 5,000 psf through a combined effect of stiff piers and an increased density of the matrix soil. Geopier uplift anchors were added to select Geopier piers to provide 30 kips of allowable uplift capacity per anchor, which was verified with an uplift load test performed to 200% of the allowable uplift capacity. A post-installation mCPT soil test also verified the densely compacted Geopier elements and the densification of the matrix soils, showing an increase of 2 to 4 times the tip resistance in the matrix soils between piers.

### PROJECT TEAM

**Owner:**

HOS Management, Pooler

**Geotechnical Engineer:**

Terracon

**Structural Engineer:**

Tharpe Engineering Group,

**General Contractor:**

The Pinyan Company

**Geopier Installer:**

Peterson Contractors, Inc.

**Geopier Designer:**

Geopier Foundation Company