

Marion Square Parking Garage

Charleston, South Carolina



History

In 1758, approximately 10 acres of land was conveyed to the colony of South Carolina by John Wragg, a wealthy land owner. This site was used as a defensive wall against the local Native Americans, and then against the British. Twenty-five years later, when there was no longer a need for defense works, this parcel was transferred to the newly formed government of Charleston, SC.

Originally named Citadel Green, because the Citadel College occupied the arsenal from 1843 to 1922, it was renamed for the Revolutionary War officer, Francis Marion.

Marion Square is now home to the local Farmer's Market from April to November, as well as the South Carolina State Arsenal

and many monuments including a Holocaust Memorial and the John C. Calhoun Statue.

Problem

Across the street from the park, at the site of the former Charleston County Public Library, sat a piece of land owned by Bennett Hospitality for the last 21 years. After ten years of approval struggles, the final ok was given to build the Bennett Hotel in 2014.

With an elevation of a mere 20 feet above sea level, Charleston has a high and fluctuating water table that deters below grade construction activities. In addition, a limited footprint and very crowded city conditions contributed to building problems.



CASE STUDY

Marion Square Parking Garage



Project Partners

Owner

Bennett Hospitality – Charleston, SC

General Contractor

Balfour Beatty Construction US – Charleston, SC

Sub-contractor

Parker Marine Contracting – Charleston, SC

Engineer

Lindsay, Pope, Brayfield, Clifford, & Assoc., Inc. – Atlanta, GA

Products

Sheet Pile: AZ 26-700 (400 tons)

Project Time Frame

March 2015 to present

Solution

Skyline Steel worked closely with Lindsay, Pope, & Brayfield to design a sheet pile foundation for the project. Sheet piles have several advantages, including they maximize the footprint of a site by building one wall instead of two and the speed of construction. Sheet pile also allows for installation in areas with high water tables, are fire rated, and have the ability to carry an axial load. Skyline Steel's sheet pile method was selected over traditional methods because it was the most cost effective solution.

Balfour Beatty hired Parker Marine to install 145 pairs of AZ 26-700 sheet piles at lengths of 40 feet to create one level of below grade parking. Sheet pile used as permanent retaining elements simplified the construction process considerably. These sheet piles were then topped by a concrete beam, which would eventually serve as a tie-in for the first-floor slab.

The sheet piles acted as temporary shoring, as well as the permanent wall. Once a tremie slab was poured, the site could be dewatered. Each pair of sheets was welded prior to delivery. However, in order to guarantee the site would remain 100% water tight, the remaining pairs had to be welded together in the field. Utility openings were incorporated into the design, with one as large as 48" in diameter.