



Charleston Harbor Resort Expansion Charleston, SC

UNITED STATES



Owner
Brothers Property Corporation

Engineer
S&ME, Inc.

General contractor
Hogan Construction Group, LLC

Dates of work
2015/01 2015/02

Main figures
Controlled Modulus Columns
620 EA.



Description

The Charleston Harbor Resort is a boutique hotel in Charleston, South Carolina, constructed on a site with poor soils consisting of layers of dredged sand over soft marine clay. The planned four-story hotel expansion included multiple swimming pools, spas and a tiki bar that required ground improvement to support the hardscape, consolidate the soil, and minimize anticipated settlement that would occur without ground improvement. Based on the many different features needing support and the numerous cutoff depths and degrees of support required, US Wick Drain was hired to develop a solution. To meet the client and project requirements, US Wick Drain implemented Bi-Modulus Columns (BMCs) as an economical and time-effective ground improvement solution.



Ground conditions

The site consisted of tidal marsh lands reclaimed with dredge spoil and uncontrolled fill near the surface. The upper 20 feet of sand, while fairly clean, had been previously dredged out of a nearby river and was placed in an uncontrolled manner. The underlying marine clay was soft and still undergoing consolidation due to the previous placement of the dredge fill. The bearing layer consisted of approximately 20 feet of relatively dense sand before giving way to an overconsolidated clay below.

Solution

US Wick Drain developed a ground improvement solution using BMCs to help strengthen, densify and compact the site's soils. A total of 620 BMCs were installed to a maximum depth of approximately 62 feet. The client's settlement criteria for the expansion was 1-inch total settlement and 1/2 inch differential settlement. The BMC design maintained these criteria and prevented further consolidation from impacting the differential settlement. US Wick Drain's ground improvement design also saved site preparation time and costs by allowing for a single working platform elevation. The upper stone portion of the BMC facilitated the varying cutoff elevations since excavation could take place to the required depth and the hardscape features could be directly constructed upon the compacted surface.

This solution was more economical than traditional piles with pile caps and saved the client significant time due to the minimal site preparation and rapid installation of the BMCs.

To support the expansion of a boutique resort in Charleston, South Carolina, US Wick Drain implemented an economical and time-effective solution of Bi-Modulus Columns.