Airports

Greenside Aircraft Taxiway and Hangar Complex

UNITED STATES

Quantico, VA

Owner
Naval Facilities Engineering Command

Engineer
Patton, Harris, Rust & Associates

General contractor
Walsh Construction Company

Dates of work
2017/01 2017/12

Main figures

Controlled Modulus Columns
1,200 EA.

Description

The Greenside Aircraft Taxiway and Hangar Complex is a large-scale public project at the Marine Corps Air Facility in Quantico, VA. The Greenside Type II Hangar will house the existing fleet of CH-53, new CH-53K Sikorsky Helicopters, and the proposed MV-22 Osprey aircraft. As part of the large design-build team, Menard provided ground improvement solutions to support the Greenside Type II Hangar foundations and slabs, adjacent concrete apron and several related support facilities.

Ground conditions

The site consists of a shallow layer of loose sand over a thick layer of very soft organic clay, underlain by a dense silty sand. The soft organic clay layer varied in thickness across the project site, but was consistently in the 30 to 35 ft thick range. The presence of the organic clay layer was of great concern to project designers due to the large settlements that were expected to occur following the construction of the hangar and associated support facilities. The lack of any significant strength in the clay precluded the use of most conventional ground improvement methods.

Solution

Due to the extreme nature of the fatty clay deposits, many alternative deep ground improvement alternatives were not financially or technically feasible.

To support the hangar and facility foundations, Menard designed a solution using Controlled Modulus Column (CMC)® rigid inclusions that allowed the General Contractor to significantly reduce the thickness of the slabs and reduce the amount of reinforcing steel required in the footings and slabs. The CMC rigid inclusions allowed construction to proceed as if the site's soils were of much greater strength and quality than what was actually the case before ground improvement.

Approximately 1,200 CMC rigid inclusions were installed beneath the multiple structures to an average depth of 64 feet and a maximum depth of more than 73 ft below grade.