



Fort Belvoir Community Hospital Fort Belvoir, VA

UNITED STATES



Owner
Fort Belvoir Community Hospital

Engineer
/

General contractor
Turner Construction Company/Gilbane Building Company Joint Venture

Dates of work
2008/03 2008/10

Main figures

Controlled Modulus Columns (CMC)TM
4900 EA.



Description

The Fort Belvoir Community Hospital is part of an integrated health care network providing medical services to the nation's wounded soldiers and their families. The \$800 million, 1.3 million sq-ft military construction project, managed by the Corps of Engineers, was fast-tracked as part of the 2005 Base Realignment and Closure program. The project required ground improvement to support the high-bearing load of the facility, which is a series of five, multi-story buildings connected to form one structure, plus two parking garages – one anchoring each end.

Due to the aggressive schedule, Menard proposed an alternative solution to rammed aggregate piers by specifying Controlled Modulus Column (CMC)TM rigid inclusions, an economical technique for strengthening the ground and increasing its load bearing capacity, while allowing for faster installation and improved sustainability via limited site import/export.

Ground conditions

The hospital is located within three miles of the Fall Line, which is the boundary separating the Coastal Plain from the Piedmont Physiographic Province. The soils immediately below the surface and extending from 7 to 12 ft are stiff to hard low plastic and high plastic clays with varying amounts of sand. Below this layer are dense sands and gravels.

Solution

The Corps designed spread footings for the project with a specified bearing capacity varying between 7,000 and 8,000 psf. Since the buildings were built near existing grade or cut down in some locations, no significant settlement was expected below the slab-on-grade, so no ground improvement was required under the slabs.

Menard designed a dense array of CMC rigid inclusion elements under each foundation support and a load transfer platform between the CMC rigid inclusions and footings to eliminate any physical connection between the ground improvement system and the structure.

More than 4,900 CMC rigid inclusions were installed at a maximum depth of 29.5 ft for a total of 63,322 LF.