



UNITED STATES

IDA Alexandria Alexandria, VA



Owner
Institute for Defense Analyses

Engineer
ARM Group, Inc.

General contractor
James G. Davis Construction

Dates of work
2019/11 2020/01

Main figures

Controlled Modulus Columns
900 EA.



Description

The Institute of Defense Analyses (IDA) proposed the construction of its new headquarters in Potomac Yard in Alexandria, VA. The 370,000-square- ft, eight-story structure (with one story below grade) would feature a designated conference center, other conference space, an on-site café, a health and fitness center and improved collaboration space and design to meet evolving security requirements.

IDA provides analysis on national security issues and related national challenges, especially those requiring scientific, technical and analytic expertise. The new headquarters is in proximity of the future Potomac Yard Metro station and the future Virginia Tech Innovation Campus. This is the latest in a nearly four-decade partnership between IDA, a non-profit corporation running three federally funded research and development centers, and the City of Alexandria. Due to variability in the site geology – and loose soils -- Menard Group USA proposed Controlled Modulus Column (CMC)® rigid inclusions to support spread and continuous footings to limit settlement and provide bearing capacity. Crane mats were also supported to aid in the erection of the building.

Ground conditions

The site, formerly part of the Potomac Yard train facility, became a repurposed Brownfield site. Miscellaneous fills extended 10 to 20 ft below grade and overlaid dense granular deposits.

Solution

As a convenience to its employees, the IDA, in part, relocated to be near the future metro station across the street from the new building. Menard, coincidentally, was contracted to install CMCs at the metro station site. For the IDA building, aggregate piers were initially recommended. Menard predicted that an aggregate pier solution would yield excessive settlement and selected to implement a CMC rigid inclusion solution which would use 900 CMC elements for direct support of spread and continuous footings. The CMC rigid inclusions would provide greater settlement control than the aggregate pier solution. The CMC elements reached an average depth of 44 ft and maximum depth of 60 ft. The CMC design met the performance criteria of 1 in of post-construction settlement with a 1/2-in differential settlement for the new building.

The CMCs were installed through the fill and lean clay and terminated in the granular terrace deposits of the Potomac Formation. Maximum design bearing pressures reached 8 ksf. For the IDA project, special coordination was required to deconflict our drilling operations with working in a pit for excavation of below-grade parking that consisted of 10-ft high retaining walls. Because a second subcontractor was working simultaneously in the pit, Menard was forced to safely maneuver its equipment in a tight work space at different elevations. This was overcome with our robust safety procedures and effective communication with the crew.

Other challenges overcome by Menard were deep cutoffs and working off of two benches, each handled with aplomb. To support the new IDA headquarters, Menard installed 900 CMC rigid Inclusions. The use of CMCs in lieu of the originally-proposed aggregate piers better fit the soils at the site, while meeting the client's requirements for quality and schedule.