



Marion County Justice Campus Indianapolis, IN

UNITED STATES



Owner

Marion County, IN

Engineer

AECOM, Patriot Engineering, Terracon, GHD

General contractor

Wilhelm, Hunt Construction

Dates of work

2019/07 2019/08

Main figures

Controlled Modulus Columns

3,000 EA.



Description

The proposed Marion County Justice Campus was described as “timeless and not trendy” when ground was broken in July 2018. The state-of-the-art facility in Indianapolis would comprise a jail, a courthouse, a sheriff’s building and an assessment and intervention center. The goal, in part, is to divert people from jail and provide them with mental health services. The \$571 million project, built on 140 acres in the Twin Aire neighborhood, would feature a total of five different structures.

Due to the compressible nature of the soils at the site (including contaminated soils), Menard Group USA proposed the use of Controlled Modulus Column (CMC)® rigid inclusion ground improvement beneath the spread footings, slabs and large mat foundations (up to 8 ksf). Support would be provided for a 13-story courthouse, a five-story adult detention center, a three-story sheriff’s building, a central utility plant and an electrical substation.

Ground conditions

The site was underlain by dense sandy fill overlying soft compressible clays up to a maximum depth of 30 ft. The upper portions of the underlying aquifer were contaminated with non-aqueous phase liquids (NAPL). The lower aquifer was not contaminated.

Solution

The presence of the contaminated upper aquifer and clean lower aquifer required that the ground improvement terminate in the contaminated portion of the aquifer and not extend into the clean portion of the aquifer. Menard used CMC rigid inclusions, which are installed with lateral displacement methods, to minimize spoils. The site would receive 6 ft of fill, which would induce a very large additional load and potential settlement. A major challenge at the site was the environmental aspect of keeping the lower aquifer clean. CMCs provided a low-risk solution, due to the lateral displacement drilling techniques and by virtue of the fact that the CMC elements are grouted rather than stone or aggregate.

Initially, augercast piles were considered for each of the structures. This, however, proved to be an unviable solution for two reasons: Firstly, the piles would have potentially caused cross-aquifer contamination because they would have extended through the upper aquifer into the lower aquifer. Secondly, the piles would have added to the overall cost due to the amount of concrete and reinforcement required. By installing CMCs, Menard saved the client more than \$1 million -- while also eliminating environmental issues. Menard also worked very efficiently -- despite a large number of contractors on site -- by mobilizing three rigs.

Menard installed approximately 3,000 CMCs at an average depth of 20 ft. Work was completed in 10 weeks, well ahead of schedule. CMCs reduced the potential for cross-aquifer contamination and allowed for significant savings in concrete thickness, reinforcement, and overall cost as compared to the original piled foundation scheme.