



UNITED STATES

Fairview High School Erie, PA



Owner
Fairview High School

Engineer
HHSDR Architects/Engineers

General contractor
E.E. Austin

Dates of work
August 2021 August 2021

Main figures

Controlled Modulus Columns
277 EA.



Description

As part of a "building boom" for Erie County schools, Fairview High was designated for a major renovation for the first time since opening in 1973. The \$45.1 million initiative would include 40 new classrooms, along with an 8,500 sq-ft addition featuring a new library and tornado shelter. Centrally located, the new addition would be adjacent to the school's cafeteria, swimming pool and various classrooms. The massive upgrade was necessitated by increased enrollment at 1,800-student Fairview High.

Due to the loose and compressible nature of the soils at the site, excessive settlement was predicted unless ground improvement was provided. Menard USA was contracted to support the 8,500 sq-ft addition with Controlled Modulus (CMC)[®] rigid inclusions.



Ground conditions

The surface layers at the site consisted primarily of silt with varying amounts of sand and clay. Beneath these layers, at a 30-ft depth, the material changed to clayey silt and silt with fine sand. The profile varied across the site.

Solution

Menard's design was based on two working pads to accommodate varying elevations in the finished floor. An upper-bench pad was used for the tornado shelter; a lower-bench pad for the library. This ensured work would be done in one continuous phase without the need for remobilization. Menard worked closely with the structural engineer in designing a CMC layout at each footing to support column loads, while also designing the elements along the wall and slab for additional support. Menard installed approximately 300 CMCs to a maximum depth of 30 ft. The design provided for 1 in of post-construction settlement with a 1/2 in of differential settlement, meeting the performance criteria of the new addition.

A challenge during the project was the presence of heavy storms. This necessitated additional support to the working pad via undercutting/gravel fill. Another challenge: The CMCs supporting the deep tornado shelter footings in the upper bench hit refusal at shallower depths than bottom-of-footing elevation. Consequently, Menard predrilled across the upper pad to determine drill depths. Despite these challenges, Menard met the owner's requirements for quality, safety and schedule.

Menard successfully installed CMCs to support a new library and tornado shelter for the 8,500 sq-ft addition at Fairview High School in Erie County. The project was completed within schedule and budget and met the settlement requirements established in the performance specification.