



UNITED STATES

Bridgewater Crossing Bridgewater, PA



Owner
Bettors Real Estate Holding

Engineer
Larson Design Group

General contractor
CJ Bettors Builders

Dates of work
2016/06 2016/08

Description

When Bettors Real Estate Holding set out to construct three new multi-story residential apartment buildings at the confluence of the Beaver and Ohio Rivers in Bridgewater, Pennsylvania, a geotechnical investigation soon determined that the soil structure was not suitable to support the new structures. The Developer's Engineer originally designed a more traditional foundation system mainly comprised of steel H piles. Menard developed an alternative ground improvement solution of Vibro Stone Columns (VSC) to support the footings and foundations of the three new buildings.

Main figures

Stone columns
546 EA.

Ground conditions

The site soils consist of an up to 15 ft deep layer of uncontrolled fill containing material such as river rock, large concrete pieces, cables, and steel rods. The fill was underlain by brown silty sand with traces of clay, wood fragments, and river rock that extended to depths of up to 45 ft.

Solution

Once VSC installation began, the uncontrolled fill layer proved to be tougher to drill through than originally anticipated. To penetrate this layer and make VSC installation easier, Menard decided to predrill to a maximum depth of 20 ft. Due to the collapsing of the holes, at times Menard needed to predrill some of the holes multiple times.

During insertion of the vibro probe into the predrilled holes, the uncontrolled fill layer collapsed on top of the probe, effectively trapping it. To extract the tooling without damaging the rig, Menard drilled angled holes into the collapsed fill. This loosened the material enough so that the tooling could be extracted.

Although complications with the fill layer set production back by a few weeks, the client was overall pleased with Menard's performance and the ground improvement solution. A total of 546 VSCs were installed to a maximum depth of 35 ft.