



UNITED STATES

59 Old Hook Road  
Bayonne, NJ



**Owner**  
Pantheon Properties

**Engineer**  
Melick-Tully & Associates

**General contractor**  
Pantheon Properties

**Dates of work**  
2006/08 2006/09

## Description

This project included the construction of a 33,000 sq-ft extension to an existing warehouse in Bayonne, NJ. As compared to the originally conceived pile-supported building with structural concrete floors, Menard proposed an economical alternative solution using dynamic compaction and Controlled Modulus Column (CMC)<sup>™</sup> rigid inclusions that eliminated the high cost of spoil removal and allowed for the use of a more cost-effective concrete floor slabs-on-grade.

## Main figures

**Dynamic compaction**  
84000 ft<sup>2</sup>

**Controlled Modulus Columns (CMC)<sup>™</sup>**  
375 EA.

## Ground conditions

The upper layers of soil consisted of highly contaminated fills overlying 5 to 10 ft of organic soft silts underlain by a competent sand layer at about 30 ft below grade. Since the upper fill was highly contaminated, the environmental closure requirements for the site had a strict limitation on how penetrations (e.g., for vertical support) were to be constructed through the upper fills and organic layer into the underlying bearing sands to avoid cross contamination with the clear water table underlying Aquifer.

## Solution

To mitigate passage of contaminants into the clean underlying sand, the New Jersey Department of Environmental Protection (NJDEP) initially required that “double cased” piles be used for support of the addition. In this scenario, a casing is driven to the organic layer, the contaminated soils are removed from inside the casing, a pile is then driven through a bentonite seal, and the casing is withdrawn and the remaining hole is backfilled.

Because CMC rigid inclusions are installed using a specially designed auger that displaces the soil laterally with no spoil, there is no need to dispose of contaminated soil. The installation technique provides a positive and immediate seal between the soil layers. The CMC rigid inclusions technique was presented to the NJDEP and accepted as a method to prevent the movement of contaminated water perched above the clay into the lower clean sand layer.

Menard’s design-build solution included the use of dynamic compaction to lower the site elevation to allow all of the soils to remain on site, and to stabilize the sub-grade under the truck staging area. The CMC rigid inclusions were used to support the building walls, loading dock, interior columns, and slab-on-grade.

In summary, to eliminate the high cost of double cased piles and contaminated soil removal, Menard designed an economical solution using dynamic compaction and CMC rigid inclusions that eliminated spoils, soil removal, and structural concrete foundations.