menard
Ground Improvement Specialists

Project Case Study
Dynamic Compaction/Controlled Modulus Columns

59 Old Hook Road

Bayonne, NJ

To eliminate the high cost of double-cased piles and contaminated soil removal, Menard designed an economical solution using Dynamic Compaction and Controlled Modulus Columns™ (CMCs) that eliminated spoils, soil removal and structural concrete foundations.

Project Summary

This project included the construction of a 33,000 square foot extension to an existing warehouse. 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 Columns™ (CMCs) that eliminated the high cost of spoil removal and allowed for the use of a more cost-effective thin concrete floor slab on grades.

Ground Conditions

The upper layers of soil consisted of highly-contaminated fills overlying 5 to 10 feet of soft organic silts underlain by a competent sand layer at about 30 feet 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 of the clear water table.

Ground Improvement Solution

To mitigate passage of contaminants into the clean underlying sand, the 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soils are removed from inside the casing, a pile is then driven through a bentonite seal, and the casing is withdrawn and backfilled.

Because CMCs are installed using a specially designed auger that displaces the soil laterally, with no spoil, there is no need to dispose of contaminated soil, and the installation technique provides a positive and immediate seal between the soil layers. The CMC 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 reduce volume to allow all of the soils to remain on site, and to stabilize the sub-grade under the truck staging area. The CMCs were used to support the building walls, loading dock, interior columns and slab on grade. The warehouse was built for a 300 psf floor loading and has been functioning well for about five years.

Owner: *Pantheon Properties*
Architect: *DiGeronimo Architects*
Design-Build Ground Improvement Contractor: *Menard*

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