



Bayonne Logistics Center Bayonne, NJ

UNITED STATES



Owner

Lincoln Equities Group

Engineer Langan Engineering and Environmental Services (Civil); Smith, Roberts & Associations (Structural)

General contractor Alston Construction Company, Inc. Dates of work

August 2021 May 2022

Main figures

Controlled Modulus Columns 8,300 EA.



Description

Lincoln Equities Group embarked on an initiative to revitalize 153 acres of a former Military Ocean Terminal site in Bayonne, NJ. Part of this effort would include the construction of an 876,140 sq-ft logistics warehouse, along with ancillary buildings. This would be the largest infill industrial redevelopment in the New York Metro area. Manhattan is within five miles of the site; Newark Liberty International Airport is within eight.

Created in the late 1930's, the site consists of reclaimed land that used dredged materials from the New York Harbor. Dredged spoils were placed behind bulkheads installed on the former mud flats. The area was then used for a myriad of military tenants, utilizing a warehouse that was built on the site as well as a military ocean terminal. The western edge was used as a liquid disposal area for water generated from terminal runoff and operations. In the early 2000s, the City of Bayonne planned to utilize this and other areas for a mixed-use development. In addition to the new warehouse, the ancillary buildings included an Auto Shop, HR Customer Center, Guard House, Wash Bay, 12K Gasoline Tank, 20K Diesel Tank and Electrical Switch Gear Pad.

Due to the nature of the soils at the site, which included uncontrolled fill, Menard USA was contracted to provide ground improvement – the selected technique was Controlled Modulus Column (CMC)® rigid inclusions.



Ground conditions

The geotechnical investigation determined the site comprised four main layers of soil; new fill, existing fill, soft clay and medium dense sand. The uncontrolled fill contained remnants of concrete debris (obstructions), which necessitated predrilling across the site. In addition, existing pipe piles were uncovered while installing CMCs in the Auto Shop building. Menard adjusted the CMC layout utilizing old, as-built records of the pipe piles to successfully install CMCs. Also, prior to work at the site approximately 20 ft of surcharge fill had been placed on one half of the warehouse building. Special consideration for that half of the building was used while analyzing the CMC solution.

Solution

Menard proposed CMCs to limit settlement and provide the required bearing capacity for the strip and spread foundations, and slab-on-grade. Menard's design evaluated the performance of 12.5-in diameter and 15.6-in diameter CMCs installed under isolated spread footings, wall footings, and slab-on-grade. The CMCs were installed through the fill and soft clay layer and terminated in the medium dense sand layer. The design provided for two in or less of total settlement for the footings. And a differential settlement between adjacent columns of ³/₄ in or less. The axial loads on the building columns vary from approximately 70 to 140 kips. Maximum wall loads are between 5.5 to 9.5 klf, and slab-on-grade load is from 500 to 1600 psf. The required allowable bearing capacity of the foundations is 4 ksf beneath the footings.

The slab area with 500 psf load between column lines 21 and 40 had been previously surcharged to at least elevation +20 ft. In this area, the post construction settlement without any ground improvement is fewer than 2 ins. Further, the resulting settlement without ground improvement falls more in line with the predicted settlement of the remaining areas of the building receiving ground improvement. To provide optimal support for the building -- and to further mitigate the potential for differential settlements between heavily surcharged areas of the site -- Menard recommended that ground improvement was not required for the slab-on-grade between column lines 21 and 40 with a load of 500 psf. By using the surcharge already on site, Menard saved the client nearly \$2 million on a \$10 million contract. Menard successfully installed 8,300 CMCs to support a new logistics center and ancillary buildings in Bayonne, NJ.

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