



## UNITED STATES

## 377 Crane Street Orange, NJ



**Owner**  
D&R Orange Urban Renewal, LLC

**Engineer**  
Mulhern & Kulp

**General contractor**  
Terminal Construction Corp.

**Dates of work**  
2021/05 2021/06

### Main figures

Controlled Modulus Columns  
536 EA.



### Description

The main train station in Orange, NJ, has been the centerpiece of increasing development in the surrounding community. This would include apartments and condominiums that make up the Linc at Orange Station on the eastern side of the station. On the south side of the station, a six-story, mixed-use building, which would include 209 apartment units, was proposed in July of 2020. The new building, with a 69,055 sq-ft footprint, would feature 142 covered parking spaces and numerous amenities for tenants. The property is situated adjacent to the train station's parking lot.

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



### Ground conditions

The site consisted of existing fill including natural sandy soils and soft silt and clay. It was determined that the soil was not suitable in its current state to support the proposed building atop conventional spread footings. It was determined that the most economical solution was to install rigid inclusions for support of the building foundations, while it was desired to utilize at-grade slabs supported atop the recompacted fill materials. MTA indicated that a supplemental investigation consisting of supervised test pits should be performed following demolition of the existing buildings to further investigate the slab support conditions and determined if any remedial measures were required for support of the floor slab. Groundwater levels varied from 7.5 ft to 20 ft.

### Solution

A different subcontractor was originally lined up to install stone columns for this project. However, general contractor Russo Development made a change and enlisted Menard to install CMCs. Menard, which had recently completed CMC installation for a project in nearby Newark, NJ, accommodated the short-notice request.

Menard installed 536 CMCs to an average depth of 29 ft and a maximum depth of 39 ft. Menard designed a layout of CMCs at each footing to support column loads up to 950 kips. Continuous strip footings required support with loads up to 25 kips/lf. Maximum design bearing pressures for the spread footings reached 6 ksf. The design provided for less than a 1/2 in of post-construction settlement with a differential settlement of fewer than a 1/2 in, meeting the performance criteria of the new apartment building. The varying bearing layer for CMCs was unique – with depths of 10 ft on the west side of the working pad and 37 ft on the east side.

A challenge at the site was the presence of an overhead Verizon line, which had to be relocated. This caused a work stoppage, pushing the target completion date from May 28 to June 10. Notwithstanding this challenge, Menard installed 536 CMCs to support the construction of a new, multilevel apartment complex in Orange, NJ.