

MENARD/ SOLETANCHE BACHY

— Essington Avenue,
Philadelphia/United States

Large-scale CMC project

In February 2009, Menard's US subsidiary, DGI Menard, in partnership with Nicholson Construction Company (Soletanche Bachy), the main contractor, launched its biggest ever controlled modulus column (CMC) site. It totals over 10,200 CMCs for the development of a vast food distribution centre for wholesalers and retailers. The structure comprises a 10.4 m high building with a surface area of 51,000 m² and a 33,000 m² peripheral loading area. It is located on a 25.5 hectare former car salvage, scrap yard and landfill site near Essington Avenue, just a few minutes from the international airport and Philadelphia city centre.

Nicholson Construction Company was contacted regarding the foundations for the basic project, which was to consist of a structural foundation, 30 cm thick, supported by driven piles. "When I first heard about the project," says Dino Kartofilis, regional manager at Nicholson Construction Company, "I thought it was the perfect opportunity for DGI Menard and Nicholson to work together and propose a design-build foundation system as an alternative to the basic solution."

"That's right," adds Seth Pearlman, chairman of DGI Menard. "CMCs are rigid inclusions that produce uniform ground improvement. They offer a number of benefits, mainly in terms of cost, for this type of project where there are stringent settlement criteria over a large surface area carrying a fairly heavy load."

The solution proposed – and ultimately accepted – consisted of using CMCs to support all the internal and external columns, as well as the wall bases, and the slab-on-grade foundations of the building and loading area. They

are distributed below the slab based on the load value. As a result, they are installed closer together under the footings, which were dimensioned to support 192 kN/m². The entire system was designed to guarantee total long-term settlement of less than 25 mm, with a column-to-column differential limited to 13 mm. In addition to the cost savings associated with the process, synergies developed by the J-V partners made the proposal more competitive from a planning point of view, in particular by preventing risks of delay. "Over the past six years, we have installed CMCs for small and medium commercial and industrial areas, as well as docks," says Seth Pearlman. "This project takes us to a new level and we fully intend to use this experience to promote CMCs for large-scale projects such as the logistics warehouses completed by our colleagues in Europe."

01 The CMCs are installed 0.9 m below the level of the finished floor, with a 0.76 m load transfer platform between their upper end and the underside of the slab. As the site had been used previously as a landfill, an airtight membrane has been placed immediately below the slab to contain any decomposition gases.

Participants

Client: O'Neill Properties Group
Project management: Merion Construction
Works: Nicholson Construction Company and DGI Menard partnership



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