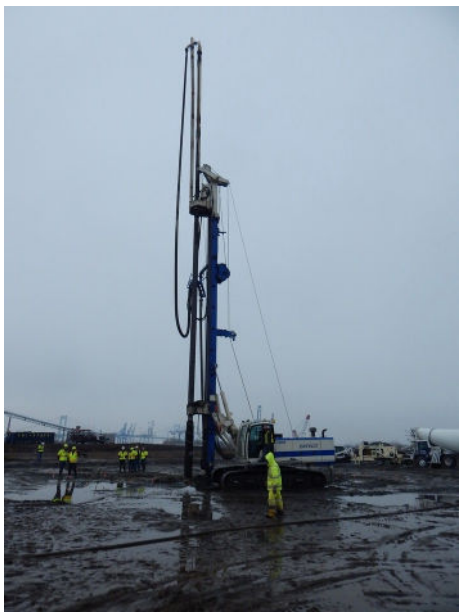
Water and sewage

Eco-Energy Ethanol Terminal

UNITED STATES

Philadelphia, PA



Owner
Eco-Energy Inc.

Engineer
GEI Consultants, Inc.

General contractor
JPC Group

Dates of work
2015/02 2015/04

Main figures

Controlled Modulus Columns
573 EA.

Description

Two storage tanks were proposed for the new Eco-Energy Ethanol Terminal at CSX Greenwich Yard in Philadelphia. The new structures each measured 48 ft in height and 100 ft in diameter. Given the considerable storage capacity and weight of the tanks, and considering the variable nature and compressibility of the soils, excessive settlement was predicted unless ground improvement was provided. Controlled Modulus Column (CMC)® rigid inclusions were proposed to mitigate the settlement and provide suitable bearing under the proposed tanks.

Ground conditions

The soil profile beneath the tanks consisted of 5 to 10 ft of upper sandy fill underlain by 55 ft of soft alluvial silty sand and clay underlain by 20-30 ft of dense gravel, and finally a stiff lower clay layer.

Solution

To meet the settlement criteria, Menard's design engineers evaluated the performance of CMCs arranged in a circular pattern for support of the tanks. The CMCs were installed through the soft alluvial silts and clays and terminated in the lower dense gravel.

The design provided support under the entire footprint of the tanks, including the designed ringwall systems. Menard installed 573 CMCs at an average depth of 64 ft to meet the settlement criteria under the two tanks.

Installation was complete within two months of mobilization, meeting the client's requirements for safety, quality and schedule.