menard
Ground Improvement Specialists

Project Case Study Wick Drains/Dynamic Compaction

Rahway River Bridge

Route 1 & 9, Middlesex & Union Counties, NJ

Menard installed 9,000 Prefabricated Vertical Drains (Wick Drains) to depths of up to 30 feet.

Before rebuilding the Rahway River Bridge, the underlying soil and fill needed to be improved so that the new structure could be adequately supported. Menard proposed the use of Prefabricated Vertical Drains (Wick Drains) and Dynamic Compaction to consolidate the soft clay soil and compact the loose fill. These Menard technologies reduced both the time and cost of construction.

Project Summary

This project involved the replacement of the Rahway River Bridge. The site is underlain by loose fill and compressible soils. The original design called for the use of vibro stone columns under the bridge approach to expedite the consolidation of soft soils and to densify fill.

Menard engineers developed an alternate solution for ground improvement utilizing a cost-saving combination of Prefabricated Vertical Drains (Wick Drains) and Dynamic Compaction. To satisfy the project requirements, Menard needed to facilitate the consolidation of underlying soft soils and to densify the existing fill material.

Ground Conditions

The Rahway River Bridge site is underlain by 2 to 15 feet of fill material that consists of sand, gravel, glass and other miscellaneous debris. This material was loose and posed significant risk of settlement after construction of the new structure. Additionally, compressible organic soils, which posed a threat of long-term settlement, underlie the loose fill material.

Ground Improvement Solution

The alternate design proposed by Menard called for 9,000 Wick Drains and 845 Dynamic Compaction prints over an area of 55,000 square feet. The Wick Drains accelerated the consolidation of the clay soil and were installed to depths of up to 30 feet.

The loose fill materials were compacted using the Dynamic Compaction technique. Compaction of the fill material was achieved by using a 15-ton weight dropped 2 to 3 times per print from heights of 35 to 50 feet.

Menard's Dynamic Compaction program achieved the desired densification while remaining within the designated limits for ground vibration. The Wick Drain approach facilitated compression of the underlying clay soils at a rate that kept the project on track. Replacing the vibro stone column solution with a combination of Dynamic Compaction and Wick Drains proved to save time and construction costs for the client.

Owner: *New Jersey Department of Transportation (NJDOT)*
General Contractor: *Union Paving*
Owner's Engineer: *Gannett Fleming*
Ground Improvement Contractor: *Menard*

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