



CONTROLLED MODULUS COLUMN

Rigid Inclusions

BASS RIVER BRIDGE

Burlington County, NJ



Owner:

New Jersey Turnpike Authority (NJTA)

General Contractor:

Northeast Remsco Construction, Inc.

Duration of Work:

8 weeks

Subsurface Conditions:

Medium to dense sand over very soft organics and dense sand layer

Approximate Key Quantities:

CMC Rigid Inclusions 1,200

PROJECT OVERVIEW

The Bass River Bridge widening and rehabilitation was a four-year project on the Garden State Parkway near Tuckerton, New Jersey. It is part of a large-scale effort by the New Jersey Turnpike Authority (NJTA) to add lanes and reduce traffic on the heavily traveled shore route.

The project involves the construction of a new span over the Bass River and U.S. Route 9, as well as the rehabilitation of the existing bridge. The specifications called for four Mechanically Stabilized Earth (MSE) retaining walls up to 40 feet tall (two parallel walls at each approach with backfill in between the reinforced zones). To support the embankments, cement grouted columns installed in two phases were specified by the NJTA. The

first phase was for support of the tall, lower walls. Then, when the lower walls had been partially built, the second phase would support the upper walls built into the existing roadway embankment. Menard provided ground improvement using Controlled Modulus Column (CMC) Rigid Inclusions to support the bridge approach and embankments.

GROUND CONDITIONS

The proposed MSE approaches were underlain by a 10 to 18 foot layer of medium dense sand. Below this was a 3 to 8 foot thick deposit of very soft organics and clays, above a dense sand layer. At the upper walls, the subsurface profile included an additional 14 to 26 feet of compacted highway embankment at the surface. Due to the compressibility of the organic deposit, excessive long-term set-

tlement was predicted for the new bridge approaches.

THE SOLUTION

Several ground improvement options were considered for the project, including auger cast-in-place piles, vibro concrete columns and aggregate piers. CMC Rigid Inclusions were selected as the most appropriate solution to improve the soil prior to MSE wall construction based on Menard's experience with similar projects, construction schedule, and cost-effectiveness.

More than 1,200 CMC Rigid Inclusions were installed to depths ranging from 13 to 48 feet. This ground improvement solution reduced post-construction settlement to acceptable levels, improved the bearing capacity and global stability of the tall walls, and supported four MSE walls.

The MSE retaining walls were designed by The Reinforced Earth Company, an affiliate company of Menard and member of the Soletanche Freyssinet Group.

SUMMARY

Menard designed and installed CMC Rigid Inclusions to support MSE retaining walls and bridge approaches as part of a major bridge widening and rehabilitation project in New Jersey.

