Roads

Route 295 Direct Connection

Bellmawr, Mt. Ephraim and Gloucester, NJ

UNITED STATES

Owner
New Jersey Department of Transportation

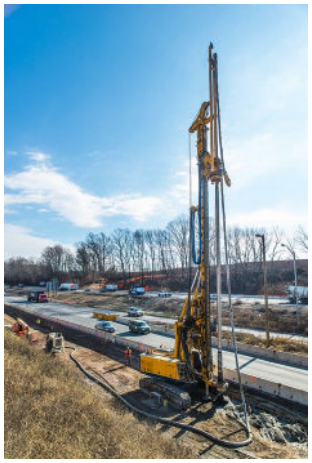
Engineer
Dewberry

General contractor
PKF-Mark III, Inc. (Phase 1), Conti Enterprises (Phase 2), South State Inc. (Phase 3)

Dates of work
2013/07 2023/01

Main figures

Controlled Modulus Columns
11,000 EA.



Description

The I-295/I-76/Route 42 Direct Connection Project in Bellmawr, Mt. Ephraim, and Gloucester City in Camden County, NJ involves the reconfiguration and reconstruction of the interchange for Interstate Route 295 (I-295), Interstate 76 (I-76), and New Jersey State Route 42 (Route 42). The project is located approximately 10 miles southwest of Philadelphia. MSE retaining walls and embankments will be, and have been, constructed to raise grades for the interchange. Construction began in March 2013 and is expected through 2023. The project has been divided into four contracts, due to the size and complexity of the interchange. The geometry of the proposed Column Supported Embankment System (CSES) and walls varies widely across the project, therefore, separate designs were prepared for each area. Due to the compressible nature of the soils across the site, excessive settlement was predicted unless ground improvement was provided.

Ground conditions

Due to the expanse of the project site, the ground surface elevation varied greatly, ranging from El. 8 ft to El. 60 ft. The soil profile generally comprised silt and clay layers that increase in strength with depth. Generally, the upper soil layers consisted of a loose to medium dense sandy fill from the ground surface to approximately El. 28 ft. The fill was underlain by a medium stiff silt/clay to approximately El. -12. ft, a stiff silt/clay to El. -25 ft on the south and El. -30 ft on the north, followed by the very stiff silt/clay bearing layer. The sandy fill was only present in certain areas across the site and much of that fill was excavated for construction of the CSES, leaving the soft clayey soils very near to the surface.

Solution

More than 6,000 Controlled Modulus Column (CMC)® rigid inclusions were installed to support six MSE walls in the first phase of the project and nearly 5,000 were installed to support new embankments, eight MSE walls and interim ramps in the second phase. The CMC rigid inclusion ground improvement successfully supported various loading criteria, including embankments, MSE Walls and roadways while meeting the project's specified settlement, bearing, sliding and external stability requirements. Despite difficult conditions – which included tight work areas, varying working elevations and proximity to high-speed traffic on roadways traversed by nearly 250,000 vehicles daily – all work was performed safely. The project was completed as designed and met all NJDOT requirements for safety, quality and schedule.