Bridges

I-35 Bridge Replacement Waco

UNITED STATES

Waco, TX

Owner
Texas Department of Transportation

Engineer
Scarborough Engineering, Inc.

General contractor
The Lane Construction Corporation

Dates of work
2012/08 2013/05

Main figures

Controlled Modulus Columns (CMC)™
3400 EA.

Description

As part of a project to expand Interstate 35, the Texas Department of Transportation constructed two new frontage road bridges along I-35 over the Brazos River in downtown Waco, TX.

Mechanically Stabilized Earth (MSE) retaining walls and embankments were designed to support the bridge approaches. The plan initially specified stone columns to provide ground improvement to support the MSE walls. Menard proposed a “value engineered” alternative using Controlled Modulus Column (CMC)™ rigid inclusions to mitigate soft/loosesoils beneath the frontage road approach ramps.

Ground conditions

Soils beneath the frontage roads structures were comprised of compressible clays and loose sands in areas. These soils required reinforcement to improve the settlement and bearing characteristics of the soils to maintain adequate performance under the walls/embankments loads.

Solution

Menard used CMC rigid inclusions for ground improvement of 134,300 sq ft of reinforced earth embankments on both sides of the river and along both sides of I-35 (four distinct work areas).

The ground improvement elements were installed through the loose and compressible soils and founded in the dense sands or limestone at depths of up to 45 ft below working grade. The bearing pressures imposed by the MSE walls ranged from approximately 500 psf to 2,750 psf. CMC Rigid Inclusions were installed on variable grids to accommodate the changing wall/embankment heights, which ranged from 5 to 22 ft from the existing grade.

On the north side of the river, Menard installed low headroom grout columns where high-voltage overhead power lines interfered with normal CMC rigid inclusions production. Menard installed thousands of the CMC Rigid Inclusions to support the MSE retaining walls, which were designed by Reinforced Earth Company, an affiliate company of Menard and member of the Soletanche Freyssinet Group. The ground improvement solution was completed on schedule.

In summary, Menard designed and installed a CMC rigid inclusion solution to support reinforced earth wall embankments as part of two new frontage road bridges in Waco.