

Tensar® and Geopier® Site Solutions Team Up for a Scenic Slope Repair

TALK

The Baltimore Washington Parkway is a historic thoroughfare linking the nation's capital and Maryland's largest city. It's also one of a select number of National Scenic Byways. So it is no surprise that the National Park Service (NPS), which manages the route, wants to preserve its gentle curves and rich landscape of native trees and shrubs.

Slope Failure Puts Parkway at Risk

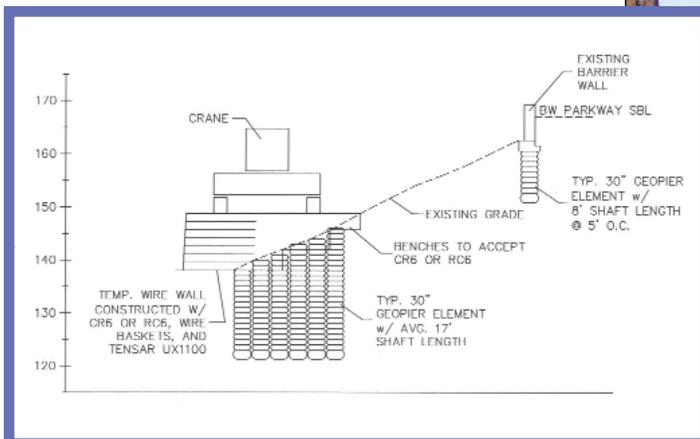
A slope failure beneath a precast retaining wall at the Maryland Route 197 interchange created several challenges for the NPS. Most significant among these issues was whether the slope could be stabilized without undue expense or seriously affecting a nearby stand of mature trees.

Staff from the Federal Highway Administration (FHWA) approached geotechnical design/build firm GeoStructures, Inc. to investigate strategies for resolving the problem. "They wanted to maintain the grassed slope and trees and not impede traffic on the parkway," says GeoStructures President Mike Cowell, P.E. "We looked at traditional strategies like caissons and H-piles but decided that these approaches would be too expensive and disruptive."

Companies Provide the NPS an Integrated Solution

Soil investigations performed by the FHWA revealed 30 to 40 feet of highly plastic clay soil within and below the 2(h):1(v) slope and wall structures. To address these conditions, Cowell suggested a combination of systems from Tensar Earth Technologies and Geopier Foundation Company. The final design included Tensar® Biaxial (BX) Geogrids (to create a haul road for heavy equipment), the Tensar Temporary Wall System (to construct a staged working platform), and Geopier® Rammed Aggregate Piers (to stabilize the slope and precast retaining wall).

The temporary haul road constructed with BX Geogrids and the Tensar Temporary Walls allowed the installation of the Geopier elements on the site.



The project's general contractor notes that this approach enabled the NPS to maintain normal traffic flow during construction. "Redirecting traffic wasn't an option," says Butch Lundgren, general superintendent for Concrete General, Inc. "Temporary roads we had used in an earlier phase of the project had already been removed."

Work on the embankment began in December 2002. Construction crews from GeoConstructors, Inc. first constructed a temporary haul road using Tensar BX Geogrid along with a working platform consisting of Tensar Temporary Walls. The geogrid was essential to ensure that heavy equipment could move over the site's soft soils without bogging down. The working platform established by the BX Geogrids and Temporary Wall allowed approximately 472 Geopier elements to be installed through the failed slope and inside a tree-save area.

Geopier Creates Soil Reinforcement

GeoConstructors President Jay Josselyn explains that his crews installed the Geopier elements by drilling 30-inch shafts 8 to 23 feet deep into specific locations within the wall and slope area. A modified hydraulic tamper then rammed 12-inch lifts of aggregate into each shaft at 1.3 million-foot-pounds of energy per minute. The beveled tamper compacted the gravel horizontally and laterally into the ground reinforcing the surrounding soils.

Two-thirds of the way through the project, GeoConstructors increased the height of the temporary wall, so a crane could be brought on-site to remove segments of the old precast retaining wall. Approximately 82 Geopier elements will be installed beneath the wall footing to stabilize the structure and create the desired load-bearing capacity. This final stage of the project is scheduled to conclude in the next few months.