Each day close to 50,000 motorists pass through the Telegraph Road Interchange along the integral I-95/495 Capital Beltway in between Virginia and Maryland. In early 2008, extensive upgrades to the interchange began as part of a multi-year project tied to the final phase of the Woodrow Wilson Bridge project. Roughly $235 million was dedicated to the interchange’s improvement. These capacity-managing improvements involved the construction of a grade separated interchange, new ramps, and the construction of a bike and pedestrian trail.

A joint venture company was contracted for the work, which focused on 24 lane miles of roadway with 321,000 yards of paving, 11 bridges, drainage improvements, retaining and noise walls, and environmental mitigation.

Maccaferri geogrids and nonwoven geotextiles have been utilized in the project’s diverse range of soil reinforcement and separation needs.

Seeking Strength

The Virginia Department of Transportation (VDOT) specifically requested high-strength geosynthetic reinforcement (defined as an “HGSG” by VDOT) with an ultimate tensile strength of 38,000 lb/ft. MacGrid® WG60, with an ultimate strength of 41,000 lb/ft., proved to be a perfect fit for the work. This geogrid is a woven grid that possesses a high molecular weight and high tenacity polyester multifilament yarns for long-term strength performance. The polymeric coating on MacGrid® WG60 provides mechanical and chemical durability and resistance to biological degradation.

Roughly 14,500 sq. yd. of geogrid was used for basal reinforcement over aggregate piers and under mechanically stabilized earth (MSE) walls and slopes. The 12.8-ft.-wide rolls provided excellent coverage, minimizing material waste and maximizing project economics. The project-requested, oversized geogrid panels, which varied in length from 350 to 450 feet, were overlapped two feet and tied together to prevent movement during backfilling. Additionally, all overlaps of geosynthetic panels were “shingled” in the direction of the fill placement. This ensured that the pushing of fill material did not alter the careful overlap alignment.

A sand layer was installed below all of the reinforcement and over the aggregate piers. Where needed, wick drains were installed to accelerate soil consolidation.

In addition to the reinforcement materials, the Telegraph Road Interchange utilized MacTex® MX-560 geosynthetic separators (defined as “SGS” in the VDOT specifications). At numerous locations, a SGS layer was requested for
separation between natural soils and select fill. Some geotextile was also used in combination with welded wire mesh for wrap-around wall construction.

The nonwoven geotextile MacTex® MX-560 was chosen for its inertness to biological degradation and resistant to chemicals, alkalis and acids. The 100% polypropylene staple fibers are needlepunched in the manufacturing process for a dimensional stability that provides exceptional filtration, separation and protection properties.

The Woodrow Wilson Bridge Project continues today, with work on the all-important Telegraph Road Interchange wrapping up as more ramps are opened and the project's goals are fulfilled.