Geocomp
Trusted to help mitigate risk

PROJECT BRIEF

Corridor H Bridge Five Pier Movement

PROJECT PROFILE

CLIENT:
E.L. Robinson

LOCATION:
West Virginia

VALUE:

- Geocomp's efforts proved that the mountainside was moving on a deep, pre-existing slip service not identified in prior site investigations
- Geocomp's monitoring system showed that movement was continuing over time and driven in part by elevated groundwater pressure in the mountainside.
- Geocomp's recommended stabilization method proved to be the most cost effective solution.

SERVICES PROVIDED:

- Site investigations
- Monitoring of sensors
- Extensive analysis of shear strength

"From the site data and sensor measurements, Geocomp engineers determined the cause of the pier movement. Eight cross sections along the roadway were examined to determine what was needed to stabilize the mountainside and remove the threat to the safety of the new bridge."

MONITORING SYSTEM AND STABILIZATION OF SLOPE

Geocomp developed a monitoring plan, coordinated site investigation, determined the depth of sliding surfaces and developed alternatives for remedial measures. Geocomp engineers continuously monitored sensors to determine the depth of sliding and reviewed piezometer data for changes in the groundwater table of the slope. From the site data and sensor measurements, Geocomp engineers determined the cause of the pier movement. Eight cross sections along the roadway were examined to determine what was needed to stabilize the mountainside and remove the threat to the safety of the new bridge. Extensive analyses were performed on each of the eight sections to calculate the factor of safety for slope stability. The analyses included back calculation of the shear strength parameters along the shear plane corresponding to a factor of safety of 1 for the current conditions. The most economical solution was determined to be the combination of the stabilizing berm, lowering the water table in the slope and installing tiebacks in some areas.

BACKGROUND

The proposed extension of US 33 project for the West Virginia Department of Transportation, Division of Highways (WVDOH) consists of a four-lane divided highway between Kerens in Randolph County and Parsons in Tucker County. This design-build project involves the design, construction and financial services necessary for constructing the proposed roadway of approximately 2.86 miles. In August 2019, the survey team recorded movement of Pier 1 at Bridge 5 of approximately 16 inches relative to where it had been constructed. All work activities were stopped at Bridge 5 pending further investigation. Allen Marr, Ph.D., P.E.,D.GE, NAE, F.ASCE was asked to provide his expertise and review of pier movements.