

## State Road P48 Landslide Stabilization Dallas County, Iowa



**Description:** Grading operations associated with the construction of State Road P48 coupled with high groundwater and a weak soil/shale zone resulted in a problematic landslide condition.

**Subsurface Conditions:** Clay fill and glacial till soils underlain by a weak zone of shale at depths on the order of 20 to 25 foot below grade. Friction angles in the shale were on the order of 8 to 10 degrees.

**Design Details:** *Geopier*® soil reinforcing elements were installed to depths of up to 30 feet to penetrate the weak shale zone and intersect the critical shearing surface. A total of 579 elements were installed to increase the factor of safety and prevent further movement of the slide. A 5-foot soil cap was installed in the tops of the piers to reduce the amount of groundwater infiltration through the piers. The Geopier soil reinforcement solution resulted in a cost of \$170,000 representing a cost savings of over \$700,000 compared to other options being considered.

**Geopier Designer & Installer:** GFC – Midwest; Peterson Contractors, Inc.

**Owner:** Dallas County, Iowa

**Geotechnical Engineer:** Allender Butzke Engineers, Inc.