

PROJECT PROFILE

BLUE TRAIL LANDSLIDE STABILIZATION ON U.S. ROUTE 26/89 IN WYOMING

The Blue Trail landslide on U.S. Route 26/89 in the Snake River Canyon of Wyoming led to extensive maintenance problems resulting from soil and rock spilling onto the busy highway. As a consequence, the highway required more than 40 times more maintenance than a typical roadway and had a higher than average accident rate. One solution would have been to build a bridge over the canyon. However, the questionable feasibility and cost effectiveness of a bridge, which had an estimated \$12.0 million cost, led the Wyoming DOT to chose an alternative design/build approach proposed by Hayward Baker, Inc. to stabilize the landslide at a cost of less than one-third that of the bridge.

As the engineer/designer for Hayward Baker, Inc., D'Appolonia developed a repair scheme incorporating a three-tiered configuration of reticulated micropile walls. The walls consisted of uphill and downhill battered micropiles extending to below the slide surface and socketed in bedrock. At the ground surface the micropiles were connected by a continuous cast-in-place, reinforced-concrete cap beam. Prestressed 10- to 18-strand ground anchors were then placed through the cap beam and bonded into competent bedrock below the slide surface. Construction was performed along very steep slopes on an active landslide.



Pre-construction photograph showing the physical constraints at site.

Inclinometers installed at the site showed that the slope movements began to slow as the wall construction proceeded, and stopped completely, when the ground anchors were tensioned. Instrumentation of the walls construction installed by D'Appolonia included nine inclinometers, 14 tilt plates, 15 strain gauges and six piezometers. The instrumentation provided valuable data relative to how the reticulated micropile-anchored wall system resisted the landslide forces.

D'Appolonia was awarded the 1998 Grand Award for excellence in engineering design by the American Consulting Engineers Council for its design work on this challenging project.



Reinforced concrete cap beam showing access for micropiles and anchors.



Micropile drilling operation.