



El Valle del Anton

Retaining Wall

Rio Jesus km20, Panama, Republica de Panama

Case Study



Panaostrich Corporation, S.A.

Background:

The Rio de Jesus runs through El Valle De Anton, a very mountainous region in central Panama. These conditions, coupled with heavy seasonal rains, cause severe damage to roadways and embankments in the area. Erosion and instability from shifting soils, periodic landslides and mud-slides plague the valley daily and were beginning to affect construction.



Embankment along the Rio de Jesus River village road
(Prior to installation of Envirogrid Retaining Wall)

Technical Information:

Materials Used: EnviroGrid 6" EGA30
45m (150ft) long
3m (10ft) high

Application: Retaining Wall

Project Length: December 2008 (5 days)
6-man Crew
Loader & Operator



Finished Project, showing the widened road and
Retaining Wall along the embankment.

Problem and Objective:

The Ministry of Public Works in Panama could not authorize work to commence on km20 of the Rio de Jesus Village road due to erosion of the road and adjacent embankment. In order to permit vehicle traffic, 2.5m of road had to be added to the existing track width.

The main objective of the project was to repair the slopes and widen the existing road to comply with the safety specifications of the Ministry of Public Works.

Design Solutions:

The Ministry of Public Works (MOP) conducted a detailed study of the area, including the soil stability and current erosion damage to the embankments. Professional Structural Engineers from the Ministry made the decision to use a retaining wall system constructed from stacked Envirogrid geocell panels as specified by the MOP to increase the width of the road and eliminate erosion of the embankment.

Construction Overview:

Construction began with the clearing of unstable soil and vegetation from the embankment and road. The base was leveled and micro-piles constructed from PVC pipe were driven into the ground to increase the bearing capacity of the soil. These piles were filled with concrete and two were placed per Envirogrid geocell panel, tied into the first layer of Envirogrid, which was also filled with concrete. Subsequent layers were built on top of the first and filled with on-site soils high in lime content. The top layer was filled with road material and guardrails were set into the layer with concrete. The project took a six-man crew, with a loader and operator, five working days to complete.

Results:

The Envirogrid geocell system formed a retaining wall that was structurally resistant to any loads applied and seismic movement in the area. The objective to increase the width of the road was met and the road was opened up to vehicular traffic. The expansion of the road was of great importance because it was the only way for local citrus farmers to transport goods to the Capitol.

After 6 months, revegetation had begun naturally in the valley without fertilizer or extra nutrients. Lush vegetation promoting soil containment and adding strength to the structure had grown in only a year after the project. Again, the Envirogrid cellular confinement system had proven its performance, sustainability, low installation cost, and eco-friendliness.



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