

Miragrid GX road embankment slope failure repair

Khun Tan - Lampooon Road, Thailand

Project Data

Project	: Khun Tan - Lampooon Road, Northern Thailand
Owner	: Department of Highway, Thailand
Contractor	: Nakorn Lampooon Construction
Products Used	: Miragrid GX60/60, GX130/30, and GX160/50 (17,000m ²)
Height of Structure	: 10 m
Completion Data	: June - October 2007

Overview

The road between the provincial towns of Khun Tan and Lampooon in Northern Thailand is an important economic link between the two towns. The failure of the embankment at Km 11, significantly disrupted traffic and posed a danger to road users.

Various repair options were considered by the Thailand Department of Highways, before the decision was made to repair the slope using geogrid soil reinforcement materials.

Method of Repair

The failed slope was trimmed back to solid ground. The toe of the embankment was bolstered by installing gabions, behind which a well compacted stable foundation was constructed.

Miragrid GX geogrids were installed at 500mm spacings to reinforce the backfill material. The slope profile was formed by wrapping the geogrids round jute geobags filled with humus and grass seeds. This method of construction has numerous benefits. Firstly it provides employment for local labor. Secondly the method facilitates practical construction of uniformly steep slopes. During the subsequent rainy season the bags retain moisture facilitating assured germination of the grass seeds.

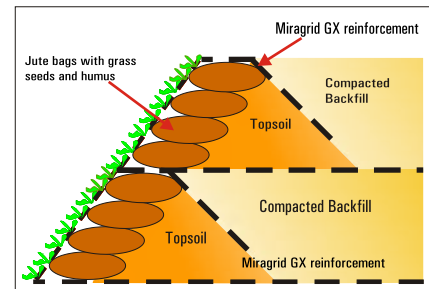
To control the risk of subsoil water seepage a drainage layer of stone aggregate wrapped with Polyfelt geotextiles was constructed up the back of the structure.

The slope was constructed in a single 10m high berm with an average slope angle of 70 degrees.

The repair works, using a local construction contractor was completed within four months. Initial vegetation growth was evident within 2 – 3 weeks of completion of the top layer.

This method of repair is especially suited for repair of failed slopes and embankments in remote rural regions. The use of geobags as the facing formwork facilitates construction of uniform slope profiles that blend into the surrounding slopes, as well as being flexible enough to accommodate protrusions such as culverts and other structures. Local labor employing medium to light construction equipment can be used to undertake the construction.

Supervision of such construction works is well within the capability of most provincial engineers. Provided the soil backfill is properly compacted and the reinforcement geosynthetic correctly installed, the finished reinforced soil structure will be stable and secure. Once the vegetation is established the slope cannot be distinguished from surrounding vegetation.



Typical cross section of the Miragrid GX reinforced slope



The erosive slip failure at Khun Tan, Lampooon



Slope repair works in progress



The completed Polyslope B slope with vegetation established

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