

# Polyfelt® PEC Slope Failure Repair

Jalan Gunung Raya -Langkawi, Malaysia

## Project Data

<b>Project</b>	: Langkawi Kedah Darul Aman, Malaysia
<b>Application</b>	: Reinforcement of a 35m-high slope using sandy soil backfill
<b>Owner</b>	: Public Works Department (PWD), Malaysia
<b>Products Used</b>	: TenCate Polyfelt® PEC 150

## Overview

Continuous rainfall resulted in a major landslide on the Federal Route that leads to the highest mountain (881m) in Langkawi which houses a museum, a park and a satellite control centre. The landslide significantly disrupted traffic and posed a danger to road users.

## Design constraints

The high, steep and unstable failed slope limited the conventional approach of trimming it to a gentle gradient. After reviewing several remedial options, PWD engineers decided to realign the road 30m out from the failed slope. This required the construction of a geosynthetics reinforced slope working up from the toe of the failure below the road.

Due to the unavailability of granular material at site, the key criteria for the design was to use the fine sandy soil that was readily available at the project site as backfill. TenCate Polyfelt® PEC composite geotextile was chosen because of its high tensile strength, optimum reinforcement and soil friction interface; and in-plane drainage advantages in such soils.

## Installation

The geometry of the reinforced soil structure consisted of a 30m-high reinforced soil slope from the toe of the failed embankment. The facing system of the structure was formed by wrapping a

net around bags filled with fine-grained soil. This method of construction facilitates practical construction of a curved slope. TenCate Polyfelt® PEC composite geotextile was laid behind the gabion and soil bags to strengthen the structure (Figure 1). A layer of TenCate Polyfelt® TS geotextile filter was placed behind the gabions to prevent soil piping through the voids in the gabions.

The primary reinforced direction of TenCate Polyfelt® PEC composite geotextile was installed perpendicular to the slope's surface. Pretensioning of the composite geotextile was done by packing it in position with the aid of wooden pegs. Compaction of backfill material was done using a 10 ton compactor to achieve a minimum of 90% proctor compaction. Hydro seeding was carried out after the slope was completed for a vegetated surface.

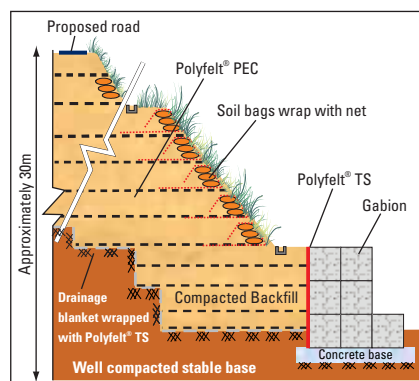


Figure 1: Proposed reinforced wall.



Figure 2: Aerial view of the slope failure.



Figure 3: Reinforcing slope with Polyfelt® PEC.



Figure 4: Vegetated slope after completion.

TenCate Polyfelt® is a registered trademark of Royal Ten Cate.

Further details of this application and products can be obtained by contacting your nearest TenCate Technical Support office. Unauthorized reproduction and distribution is prohibited. This document is provided as a supporting service only. The information contained in this document is to the best of our knowledge true and correct. No warranty whatsoever is expressed or implied or given. Engineers wishing to apply this information shall satisfy themselves on the validity of the input data relative to the applicable soil and engineering conditions and in doing so assume design liability.

**TenCate Geosynthetics Asia Sdn. Bhd.** (264232-U)  
14, Jalan Sementa 27/91, Seksyen 27,  
40400 Shah Alam, Selangor Darul Ehsan, Malaysia.  
Tel: +60 3 5192 8568 Fax: +60 3 5192 8575  
Email: info.asia@tencate.com www.tencategeosynthetics.com

**TENCATE**  
materials that make a difference