

Mangrove coastline rehabilitation using Geotube®

Langkawi, Kedah, Malaysia

Project Data

Project : Coastline Protection for Mangrove Rehabilitation, Langkawi, Malaysia
Owner : Department of Irrigation and Drainage, Malaysia
Products Used : Geotube® GT1000

Overview

Like many tropical islands facing the threat and consequences of global warming Langkawi Island off the north west coast of Malaysia is experiencing increased erosion of beaches and mangrove swamps.

To rectify this problem the Malaysian Department of Irrigation and Drainage (DID) has begun an intensive rehabilitation project involving use of geosynthetics.

Design Constraints

One of the main constraints facing the engineers tasked with solving Langkawi's erosion problems is the fact that access to the worst affected areas is inhibited by the mangroves themselves or houses constructed too close to the beach. This required a technical solution that did not involve further damage to the environment or affect local residents.

TenCate Geotube® was chosen as the most environmentally friendly and practical solution. The Geotube®, placed just offshore prevent erosive scour and protect replanted mangrove saplings from tidal wash.

Installation Technique

The Geotube® installed to protect mangroves was required to be installed just offshore on very soft marine silt mudflats that are exposed during low tide, but are underwater during high tides. To prevent the tubes sinking into the very soft mud, a working platform comprising bamboo was laid out along the alignment of the tubes. The tube was then placed over the bamboo mattress and pumped full of dredged silty sand. To prevent scour erosion along the toe of the tube a scour apron of Mirafi® PP80 was installed.

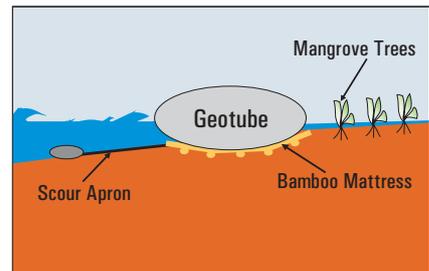
The inflated Geotube® serves to dissipate the

power of the waves and limit erosive scour behind the tubes protecting young mangrove saplings that have been replanted between the tubes and the mangrove shoreline. The positive effects of TenCate Geotube® are immediately apparent compared to areas where there are no tubes.

Benefits of Geotube®

TenCate Geotube® is a cost effective and practical solution for all types of beach and mangrove erosion problems. The system is relatively easy to install and utilizes sand fill from nearby sources. The pumped sand is dewatered by the tube leaving a solid, but flexible structure that is able to withstand the force of water and waves. Experience has shown that TenCate Geotube® is an environmentally friendly solution to a complex problem. Mangrove vegetation can quickly be reestablished which in turn protects young fish fry from predators and increases local fish stocks.

On previous projects marine bird life has been seen to return to the area and use the semi submerged tubes as a rest and feeding platform.



Typical cross section by Geotube®.



Geotube® containment unit was installed on top of bamboo mattress.



Protection of shoreline allows the growth of mangrove saplings.



Birds and other wildlife find the exposed Geotube® systems ideal places to rest, sun and fish.

Geotube® is a registered trademark of TenCate.

Further details of this application and products can be obtained by contacting your nearest TenCate Technical Support Office.

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