CASE STUDY

SOLMAX

COASTLINE PROTECTION, BRUNEI

GEOTUBE Geobags in coastal erosion control

Industry:	Water
Sub-industry:	Coastal protection and reclamation
Location:	Brunei
Product:	**GEOTUBE®** Geobags

Overview

The coastline of Brunei has faced significant challenges due to the rise in seawater levels, which has accelerated soil erosion and land loss. To address these issues, a project was initiated to install **GEOTUBE** Geobags along vulnerable stretches of the coastline. These bags, made of interconnected cells filled with locally sourced sand, serve as durable barriers against the erosive forces of high tides.

Challenge

The project took place on the coastline of Brunei, primarily impacted by erosion post-monsoon seasons. Installation of the **GEOTUBE** Geobags started in August 2023 and was completed in a swift 10-day period. The urgency was due to the worsening condition of the coastline each year, necessitating immediate action to prevent further deterioration and protect vital infrastructure, such as coastal roads.

The installation process was meticulously planned and executed. It involved site preparation, formwork installation, **GEOTUBE** Geobags placement, sand filling, compaction, formwork removal, and stitching and closure of the bags. Each step was crucial to ensure the stability and effectiveness of the barrier.

The GEOTUBE Geobags were installed quickly over 10 days in August 2023 due to the rapidly worsening condition of the coastline, which required urgent action.

During the installation, the project faced significant challenges, including the risk posed by excavating near a potentially unstable tree. The tree's roots were exposed, and it played a critical role in natural coastline protection. This required a careful assessment of the benefits and risks associated with removing or preserving the tree. It was decided to perform the soil excavation with extreme caution to avoid disrupting the tree, ensuring the preservation of natural coastal defenses.

Another complex aspect was the innovative approach taken during the installation, where the contractor adjusted the arrangement of the cellular bags to create a curved structure, enhancing the barrier's effectiveness against wave forces.

The area was backfilled with soil and hydroseeded to promote vegetation growth, further stabilizing the newly formed barrier and integrating it into the natural environment. This approach benefited local communities by ensuring safe driving conditions and preserving natural landscapes.

Solution

Solmax provided twenty units of **GEOTUBE** Geobags for this project. These **GEOTUBE** Geobags were selected for their proven effectiveness in soil stabilization, and slope protection. The geobags are recognized by the ABCI (Authority on Building Control and Construction Industry), underscoring their reliability and performance.

Initially, traditional coastal protection methods such as the use of rocks were considered. However, due to concerns about the carbon footprint, transportation costs, and the environmental impact of quarrying, a shift was made to a more resilient and cost-effective solution using **GEOTUBE** Geobags. These bags offer several advantages, including flexibility in installation, reduced environmental impact, and cost efficiency.

This project highlighted the feasibility and effectiveness of innovative, cost-effective solutions in coastal protection. It underscored the importance of environmental considerations in engineering projects and demonstrated how alternative solutions could provide superior outcomes compared to traditional methods.

The use of **GEOTUBE** Geobags in this project serves as a model for similar coastal protection initiatives worldwide, highlighting how engineering solutions can align with environmental protection and community safety.