

## Case Study

application	Shoreline Protection- Revetment	job owner	Coal Fired Power Plant
location	Caribbean	date of installation	May 2015
product	Geotube® Marine Structures Technology		

### THE COMPANY

TenCate develops and produces materials that function to increase performance, reduce costs, and deliver measurable results by working with our customers to provide advanced solutions.

### THE CHALLENGE

A large utility company in the Caribbean suffered major shoreline erosion from years of repeated storm surge consisting of 3+ meter waves. The waves and storm surge eroded 50 meters of beach and destroyed the living shoreline jeopardizing the power plants impoundments and coal storage. Due to limited real estate on the island, the utility company had no choice but to reclaim the beach and fortify the shoreline to prevent a breach of its critical infrastructure.

### THE DESIGN

Stone filled gabions were originally planned for the protection of the shoreline. However, the risk of failure due to rusting steel, and the

inability to restore the living shoreline on top of gabions, introduced an opportunity for Geotube® Marine Technology. Other successful Geotube® projects in the region convinced the utility company to change their plans and engineer a Geotube® constructed revetment. The design included a combination of stacked 45' and 34' circumference Geotube® containers. Geotube® Flat End technology was used to achieve a constant elevation and seamless transition across Geotube® container junctions. Scour aprons were included for use under the base layer to protect the containers. The design also called for restoring the damaged ecosystem by covering the 4 meter high, 182 meter long Geotube® structure with rock, sand, and local vegetation.

### THE CONSTRUCTION

Construction began on the project in May, 2015. The contractor leveled an 18 meter wide

area near the low tide line. Two 50 meter scour aprons were installed at one time with 3 meter overlaps. The contractor then deployed one 30 meter long Geotube® container and filled it with sand from a slurry box that was positioned on the escarpment above the structure. A steel frame was utilized to support the flat ends of the Geotube® containers to ensure proper overlaps at junctions. This process was repeated to complete the installation. The area between the structure and the eroded shoreline was backfilled with sand to complete a level platform.

### THE PERFORMANCE

In August, 2015, near the end of the installation, Hurricane Erika took a path directly over the project location. The winds reached 69 km/h and the waves exceeded 3 meters. The Geotube® structure protected both the shoreline and power plant property without any damage.





## How Geotube® Marine Containment Structure Technology Works

Building a marine containment structure with Geotube® technology is a three-step process.

In the *filling* stage, the Geotube® container is filled with dredged sand or similar materials. The Geotube® containers are constructed of a unique fabric, specially engineered for a marine structure.

In the *containment* stage, the durable and high retention fabric allows the dredged materials to fall out of suspension and form a dense monolithic structure.

In the final stage, *structural*, the contained and densified material serves as a structural mass. When utilized with an accompanying Scour Apron, the Geotube® container may be utilized as a sand dune core or other shoreline re-nourishment or erosion prevention medium.



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