

Geotube® Containment Structures Reinforce Sand Dunes Along Atlantic Ocean

Beach front property is protected by Geotube® container reinforced sand dunes.

Severe erosion along the New Jersey coastal community of Beach Haven threatened to destroy homes. To prevent further beach erosion and protect property, New Jersey Department of Environmental Protection designed a reinforced sand dune with Geotube® containers along 400 feet of beach. The design called out tan-colored Geotube® containers to blend into the natural beachscape. Also, specified was a tan geotextile shroud adding further protection for the Geotube® container in the event that a



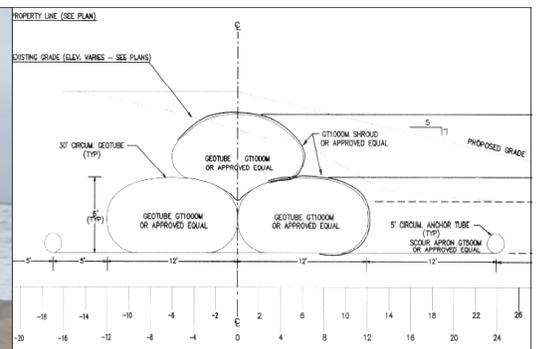
severe storm removes sand covering the tube. TenCate™ develops and produces materials that function to increase performance, reduce cost, and deliver measurable results by working with our customers to provide advanced solutions. Geotube® containment technology has been used in scores of countries to rebuild beaches, protect property, create jetties and even build entire islands.

TenCate™ fabricated the tan shroud onto the top and seaward side of the Geotube® container. Unique Geotube® flat ends were fabricated onto the ends of units butting up to the piers on either end of the installation.

Geotube® structures are embedded in the sand to dissipate wave energy and protect property from erosion.



Before Geotube® container protection, this house was being undermined. The beach was gone.



NJ DEP detail illustrates the two/one Geotube® unit pyramid with scour aprons and anchor tubes.



A 12' deep excavation was required to achieve the designed final dune elevation.



Geotube® unit unique flat ends abutted the piers on either end of the installation making a tight fit. Tri-State Dredging placed and filled the seaward tube, then the dune-side tube. Upon completion of the first layer, the final 200' long Geotube® container was stacked on top and filled to six feet.



Scout aprons were deployed and anchor tubes filled before placing the 34' circumference x 145' long seaward tube. The challenge for the contractor, Tri-State Dredging, was working around the tidal fluctuations.



Sand to fill the tubes was imported, then scurried with sea water in a 30 cy roll-off box to be pumped to the tubes. Tri-State Dredging used a 6" submersible hydraulic pump to fill the Geotube® containers..



Additional sand was imported to cover the Geotube® structure and return the dune to its original profile. The beautiful New Jersey Beach has been restored and protected.

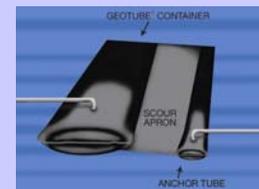
How Geotube® Marine Containment Structure Technology Works

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.



Step 1: Filling



Step 2: Containment



Step 3: Structural

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