TRITON®
COASTAL AND WATERWAY SYSTEMS

Barnegat Inlet Lighthouse Revetment

Barnegat Inlet, New Jersey

APPLICATION: Foundation/filtration mat for a rubble armor layer to protect an underwater slope.

THE CHALLENGE: Install revetment measures to protect an underwater slope from strong tidal currents.

SITE CONDITIONS: The narrow inlet at the northern tip of Long Beach Island features some of the strongest tidal currents in the continental US. Over time, tidal currents had created a scour hole which threatened the stability of the lighthouse foundation.

ALTERNATIVE SOLUTIONS: A conventional solution would have involved installing loose gravel or geotextile as a filter to contain eroding soil particles. This filter would have been capped with armor stones to prevent the material from shifting and eroding away.

The US Army Corps of Engineers concluded that this approach was impractical because of the swift currents at the site.

THE SOLUTION: A specially designed Triton® Biaxial (BX) Marine Mattress was used to encapsulate and support the filter material. Gravel inside the geotextile lined compartments helped ballast each filter mat until it could be lifted into place and secured with armor stone. Construction took place during Winter 2001.

Barnegat Inlet Lighthouse

The USACE asked Tensar to design a Triton Marine Mattress that was 4 in. thick instead of the typical 12 in. Each mattress was constructed with Tensar BX1500 Geogrid and measured 4 in. thick by 6 ft wide by 20 ft long.

Tensar created transverse compartments by specifying internal baffles at 2 ft intervals. Each compartment was lined with non-woven geotextile (fabric) and filled with 1.5 in. to 3 in. stones. Installation of a top panel completed the mattress assembly.

Up to five mattresses were tied together to form a 20 ft by 30 ft unit. Ganging mattresses in this way enabled the installer to reduce overlaps and place more units during ebb tide (the only time when installation was possible).

The installer used a barge-mounted crane to lift and place each unit. The lifting frame was manufactured locally.

PROJECT HIGHLIGHTS

Project:
Barnegat Inlet Lighthouse Revetment

Location:
Barnegat Inlet, New Jersey

Installation:
Winter 2001

Product/System:
Tensar® BX1500 Geogrid
Triton® Coastal & Waterway Systems

Quantity:
32 units (160 individual mattresses)

Owner/Developer:
US Army Corps of Engineers

Design Engineer:
Philadelphia District Corps of Engineers

General Contractor:
Cashman Construction

Materials Supplier:
Tensar International Corporation.

A total of 32 units (160 mattresses) were installed using an overlapping pattern. The entire structure was armored with stones weighing 500 to 800 pounds each.

ECONOMIC/CULTURAL IMPACT: The 1858 lighthouse locally known as "Old Barney" is considered a historic treasure and landmark. While the structure was not in immediate danger, erosion and undermining posed a long-term threat.

The project was completed for less than $1.4 million. Representatives of the Army Corps have since used the Triton System on several other projects.

ADDITIONAL INFORMATION AND SERVICES:

Tensar International Corporation, the leader in geosynthetic soil reinforcement, offers a number of integrated marine systems. Our products and technologies, backed by the most thorough quality-assurance practices, are at the forefront of the industry. Highly adaptable, cost-effective and installation-friendly, they provide exceptional, long-term performance under the most demanding conditions. Our support services include site evaluation, design consulting and site construction assistance.

For innovative solutions to your engineering challenges, rely on the experience, resources and expertise that have set the industry standard for nearly three decades.

Triton Marine Mattresses prior to installation

Lifting of Triton Marine Mattress

For more information on the Triton System or other Tensar Systems, call 800-TENSAR-1, email info@tensarcorp.com or visit www.tensarcorp.com

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