



Newark Liberty International Airport

Newark, New Jersey

APPLICATION: Restoration and erosion control of a tidal ditch embankment with an outfall pipe. The ditch, which is a conduit for storm water, runs roughly parallel to an active runway.

THE CHALLENGE: The embankment's location at the edge of an active runway limited access and space for project workers and materials. Since the runway remained active during the project, it was also extremely important that there was as little on-site staging as possible.

SITE CONDITIONS: In addition to the active runway, the water in the tidal ditch was brackish and could quickly corrode structures containing metal components.



Two mattresses were specifically created in a trapezoidal shape to fit with the site's unusual contours.

The FAA requires nonmetallic materials whenever possible in active navigation areas such as runways and blast pads.

ALTERNATIVE SOLUTIONS: Since metal components corrode, any solution that contained metal was unsuitable for the project. Another alternative was a loose riprap installation; however, such an installation would increase the embankment slope's thickness due to large stone requirements. Also, this costly alternative could restrict the cross-sectional area of the ditch, resulting in accelerated velocity and scour. A loose riprap installation could also introduce the possibility of loose stones on the runway.

THE SOLUTION: Tensar International Corporation's Triton® Marine Mattress System was chosen for its proven performance in high-velocity water flow, quick and easy installation, adaptability, and its nonmetallic, non-corrosive, and weather-resistant properties. In addition, the use of mattresses allowed a minimum of on-site staging since the mattresses were assembled off-site, then brought in by truck and lifted directly onto the prepared embankment slope.

GeoSyn Products Inc. (Creter Vault Corporation) preassembled 114 mattresses off-site, filling the mattresses with AASHTO 1 stone (1 to 4 in.). While the majority of the mattresses were between 10 and 15 feet in length and a standard rectangular shape, GeoSyn specially fabricated two mattresses in a trapezoidal shape to accommodate irregular formations at the site.

PROJECT HIGHLIGHTS

Project:

Newark Liberty International Airport

Location:

Newark, New Jersey

Installation:

October - November 2014

Product/System:

Triton® UX200 Marine Mattress System

Quantity:

114 Mattresses (7,463 sq ft)

Owner/Developer:

Port Authority of New York and New Jersey

Design Engineer:

Port Authority of New York and New Jersey

General Contractor:

Ritacco Construction, Inc.

Materials Distributor:

GeoSyn Products Inc.
(Creter Vault Corporation)



The mattresses were lifted off the delivery truck and directly placed on the embankment.

Upon delivery to the site, the preassembled mattresses were lifted directly from the delivery trucks and set in place by six-person crews from Ritacco Construction, Inc. Once placed on the slopes, some field modifications were required to allow the existing storm drains (from 12 to 36 inches in diameter) to exit through the mattresses. To achieve this, the crews simply cut into the specific mattress geogrid, removed some stone, and closed up the slits with UV-stabilized braid.

Tensar engineers devised a novel anchoring solution to accommodate a galvanized pipe at the head of the embankment's slope by reconfiguring the mattress-lifting hoop. Instead of a series of anchors positioned down the face of each mattress, a single anchor was secured through the pipe and into the bank. The adjustment saved time and money, while still providing the enhanced protection needed to prevent the mattresses from sliding down the embankment. Carlo Ritacco, project superintendent, noted that the new anchoring solution was better suited to the project, since the anchors could stagger the poured fencepost foundations.

THE TRITON SYSTEMS ADVANTAGE:

Triton® Coastal and Waterway Systems adapt to the most difficult conditions to provide durable solutions that reduce costs. A family of innovative composite marine structures, Triton Systems are made of geosynthetic materials designed to be integrated with available fill and/or native vegetation. Triton Systems are used for:

- Channel lining
- Bridge scour protection
- Causeway, levee, dike, and bridge approach projects
- Pipeline and cable protection
- Living shoreline projects
- Foundations for breakwaters, groins, and jetties
- Erosion and scour control
- High-strength fills built in submerged conditions
- Underlayers for riprap in submerged and soft soils
- Capping of contaminated sediments

Flexible and resilient, Triton Systems conform to land contours and site formations, resisting scour better than rigid systems. Due to the nonmetallic, co-polymer properties of Tensar® Geogrids, they resist all naturally occurring forms of chemical, biological, and environmental degradation – from saltwater to industrial runoff to contaminated sediments.

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

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