



HOLOLANI CONDO SHORE PROTECTION LAHAINA, HAWAII (MAUI)

Application: Previous shoreline protection measures at an oceanfront condominium resort in Maui, Hawaii were jeopardized without proper scour protection. As a result the shoreline had eroded to within 15 feet of the hotel deck. Before the beach could be returned to the “heavenly” sands its name implies, a temporary emergency application was needed to defend against the erosive forces of wave activity with a fast turnaround.



The Challenge: While weather climates are typically calm and mild, infrequent northwest swells and Kona storms can approach the island quickly and unexpectedly. Local authorities preferred that the scour protection solution hold up in all weather conditions. As a result, unconfined stone, or riprap, could not be an option considered for installation.

Site Conditions: While the Pacific coastline offers a spectacular view of the islands of Lanai and Molokai, the beach itself extends only tens of feet from the waterline, offering limited space for construction activities. It was intended to have production setup onsite so that installation could transpire promptly and simply.

Alternative Solutions: Gabion containers were considered as a soil erosion “sea wall” for earth retention, however many gabion solutions are fabricated from steel, which can easily corrode in and around salt water. Stainless steel options were available, but none were as attractive in material selection or cost as the chosen polypropylene.

The Solution: Due to the successful track record of marine mattresses in similar scour protection applications and the urgency with which a new solution was needed, Sea Engineering, Inc., the coastal engineer, chose Triton® BX Filter Mattresses for the job. The mattresses would be used as a foundation structure for the sand-filled geotextile bags that were installed for erosion protection.

The project was designed for a five-year lifespan; enough time to acquire permits for a more permanent solution. Tensar® Biaxial (BX) Geogrid, manufactured from a stress resistant polypropylene, provided the housing for the Triton Filter Mats, which were then filled with armor stone. Geotech Solutions supplied the materials and fabricated the mattresses.

PROJECT HIGHLIGHTS

Project:

Hololani Condo Shoreline Protection

Location:

Lahaina, Hawaii (Maui)

Installation:

Summer 2007

Product/System:

Triton® Biaxial (BX) Filter Mattress

Quantity:

129 Triton® Mattresses

Owner/Developer:

Hololani Condo Association

Design Engineer:

Sea Engineering

General Contractor:

Nielson Construction

Construction Management:

Allana, Buick and Bers, Inc.

Materials Supplier:

Geotech Solutions

CASE STUDY



The installation required a slight learning curve, but within a couple of days, the system was rolling out smoothly. Eight-inch thick mattresses were placed on a firm clay/coralline substrate with 10 ft by 5 ft sand bags atop, then another layer of mats. In total, 114 mattresses were installed shore side and another 15 were used to create a 3:1 ramp for shoreline protection between two properties.



Sea Engineering's Coastal Engineer Jim Barry remarked, "The Triton Filter Mats provided excellent scour protection. As the mattresses settle their protection increases, keeping the sand bags from rotating." The mattresses mimic the natural beach by carrying sand through their porosity – a main advantage according to Barry.

Three days after installation completed, the Maui island was hit by a northwest swell. Winds turned to gale force southerlies over the next two days producing heavy southerly seas and immense rain. It was reported that the Triton Mats took a "beating" but held up strong!

The Triton System Advantage: The project owner and consultants selected Triton BX Filter Mattresses because of their:

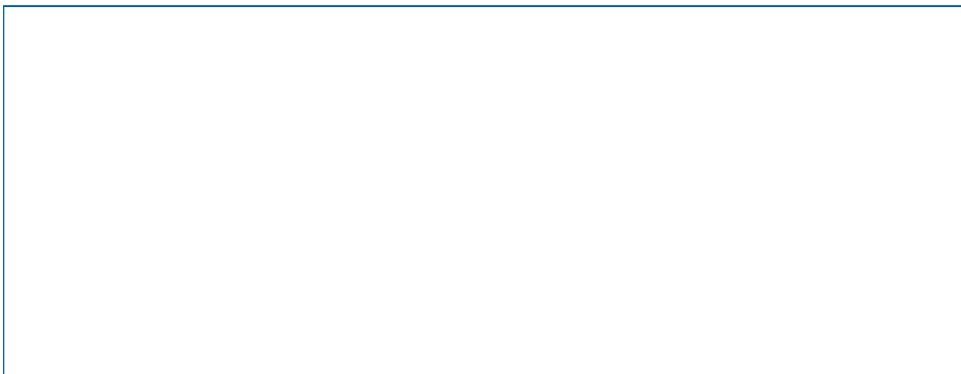
- Flexibility to maintain contact with the subgrade in changing conditions
- Ability to completely contain the stone fill, allowing for no mess on the beach
- Design flexibility; the engineer was able to select the exact thickness and length of the mats needed to resist the design wave
- Strength to accommodate the site's strong tidal currents due to Tensar Geogrid fabrication
- Scour protection beyond the seawall footprint

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 more than two decades.

For more information on the Triton Coastal & Waterway Systems or other Tensar Systems, call **800-TENSAR-1**, e-mail info@tensarcorp.com or visit www.tensar-international.com.

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