

Case Study

application	Armored Revetment Reconstruction
location	Nahant Beach Causeway, Nahant, MA
product	Mirafi® FW700

job owner	Massachusetts Dept. of Conservation & Recreation
engineer	Stantec
contractor	Pihl Inc, General Contractor
distributor	RDA Construction Corp, Marine Contractor
date of installation	A.H. Harris & Sons, Inc.
	October 2010 - August 2011

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

The Commonwealth of Massachusetts Department of Conservation and Recreation awarded a \$20 million 3-year contract to Pihl Inc. for the Nahant Beach Rehabilitation Project in Nahant, Massachusetts in June 2010. A major part of the project was reconstruction of the deteriorated armored revetment system which protects the 1.5 mile causeway and beachfront parking areas.

THE DESIGN

The new revetment design included 3 different armor stone configurations. The existing revetment would be removed and the sloped sub-grade areas built up to the design elevations. TenCate Mirafi® FW700 was selected as the "Geotextile Filter Fabric" to completely wrap the 6" to 12" layer of 3/4" crushed stone bed-

ding being placed under the armor stone. The overall 1.5 mile revetment included sections of reinforced concrete seawall behind the heavy armor stone facing. The combination of Mirafi® FW700 geotextile-wrapped bedding stone, heavy armor stone and concrete seawall was designed to prevent erosion of the subgrade

from tidal action and dissipate heavy wave impact during a major storm event.



Nahant Beach Causeway before construction.



Nahant Beach Causeway during construction.



Placement of Mirafi® FW700 over bedding stone.

THE CONSTRUCTION

Rebuilding of the revetment began in the fall of 2010, starting with the removal of the existing revetment and reshaping the subgrade slope for placement of the bottom layer of woven geotextile filter fabric. Mirafi® FW700 was selected for its excellent filtration, drainage and strength qualities. The specified thickness of crushed stone bedding was placed on Mirafi® FW700, then wrapped with a top layer of Mirafi® FW700. The armor stones which ranged in weight from 3.2 tons down to 250 lbs each, were then placed on Mirafi® FW700 in layers, from 2.3' to 7' thick depending on the revetment configuration. The 1.5 mile revetment construction continued through 2010 and was completed in August of 2011. The remaining portion of the Nahant Beach restoration project is due to be completed in late 2013.

THE PERFORMANCE

The general contractor's project manager stated that the "Mirafi® FW700 wrapped stone bedding layer" was the most important part of the revetment design, as it allows both infiltration and exfiltration of the seawater from behind and under the armoring stone, preventing erosion of the subgrade, which caused parts of the original revetment to wash away." The rebuilt 1.5 mile long revetment system is now protecting the Nahant Beach causeway and performing as expected.



Finished revetment at low tide.



Finished revetment at low tide.



Finished revetment at high tide.

TenCate® Geosynthetics Americas assumes no liability for the accuracy or completeness of this information or for the ultimate use by the purchaser. TenCate® Geosynthetics Americas disclaims any and all express, implied, or statutory standards, warranties or guarantees, including without limitation any implied warranty as to merchantability or fitness for a particular purpose or arising from a course of dealing or usage of trade as to any equipment, materials, or information furnished herewith. This document should not be construed as engineering advice.

Mirafi® is a registered trademark of Nicolon Corporation.

© 2012 TenCate Geosynthetics North America