



Case Study

application MSE Wrapped Face Wall
location Ko' Olina, Oahu, HI
product Mirafi® HS400PP

job owner Marriott Ownership Resorts
engineer Geolabs, Inc.
contractor Koga Engineering

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 Marriott Ko'Olina Resort, located on an exclusive beach in Oahu, needed a grand waterfall to greet guests upon their arrival to the resort. The waterfall surfaces were to be formed with shotcrete and inlayed with boulders. A MSE fabric wrapped wall was required to retain the native soil and support the shotcrete facade.

THE DESIGN

To create the waterfalls, a 13.5' high fabric wrapped MSE wall was constructed using Mirafi® HS400PP as the primary reinforcement. Each layer of reinforcement was designed to incorporate a 1.5' face height and a 3' wrap-back in addition to the required embedment length. The MSE walls were designed to support heavy construction traffic as well as shotcrete, boulders, and ponds. Mirafi® HS400PP was chosen for its high Long Term Design Strength and low cost. Mirafi®



The completed 13.5ft Mirafi® HS400PP wrapped wall supports the shotcrete facade.

HS400PP was overlapped a minimum 6 inches to better retain the soil at the face. Upon completion of the fabric wrapped wall, a fiber reinforced shotcrete mix was applied directly to Mirafi® HS400PP exposed at the wall face.

THE CONSTRUCTION

Construction of each MSE wall began by excavating the existing native soil to the required elevations for placement of the first layer of reinforcement. Mirafi® HS400PP was placed from the back of the excavation, towards the front. Wooden forms were constructed at the



To begin the waterfall project, excavation of the native soil was required.



Wooden forms create the vertical face. Mirafi® HS400PP was placed up the back of the form.

wall face to create the vertical faces of each lift. The reinforcement was placed up the back of the wood form, with a flap of reinforcement draped over the face. Once the on-site fill materials were compacted into place over the reinforcement lengths, the 3' long flap was wrapped –back over the top of the soil. The construction process was repeated for each lift (every 18”), until the wall reached its full required design height. Upon completion of the MSE portion of the wall, a fiber reinforced shotcrete mix was applied directly to Mirafi® HS400PP exposed on the face of the wall. This shotcrete was then formed, colored, and textured into an artificial rock surface.

THE PERFORMANCE

The ability to complete site grading operations without staging around the retaining walls, helped keep construction development on schedule. The MSE walls for this project were completed in May of 2002 and look spectacular. Both the engineer and contractor are pleased with the performance of the finished product. The use of MSE wrapped face walls with a shotcrete applied face allows architects and engineers an infinite choice in facing treatments.



Fiber reinforced shotcrete mix was applied directly to the Mirafi® HS400PP on the face of the wall.



Above: The completed waterfall feature is a beautiful new addition to the Marriott Resort.
Left: Fill was compacted, and the 3' long flap was wrapped over the top of the soil.

TenCate™ Geosynthetics North America assumes no liability for the accuracy or completeness of this information or for the ultimate use by the purchaser. TenCate™ Geosynthetics North America 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.

© 2010 TenCate Geosynthetics North America

03.10