

EUSTATIA ISLAND BEACH RESTORATION

EUSTATIA ISLAND - BRITISH VIRGIN ISLANDS, BRITISH VIRGIN ISLANDS, BRITISH VIRGIN ISLANDS

Breakwaters and Groynes

Problem

The beach at Eustatia Island was eroding; erosion was progressing at an alarming rate by 2008, threatening upland infrastructures, including the loss of trees. The erosion line got as far as the beach dining pavilion, 20 yards from the original shoreline from a few years prior.

Solution

The preferred design alternative was a very low profile groin to allow regeneration of the beach through retention of sand migrating in from the reef. During the permitting phase, however, erosion progressed, prompting the need for a revetment to be added to the design. The final design of this project incorporated a groin field consisting of 9 low profile groins designed to reduce oblique wave energy and retain sand in the area of influence of the groins. During storms it is likely that sand will be lost from the beach, but the groins will act to rebuild the beach width to its pre-storm equilibrium.

The second design element was a low, sloping wall designed to protect the upland from direct wave attack during storms associated with high water levels. Both design elements relied on sand-filled Maccaferri Macbags as the primary construction material. The two elements acted together to retain upland sand, protect palm trees and beach pavilions, and provide a relatively stable sandy beach. Presently, OCC is executing a monitoring plan that includes beach surveys and aerial photography. The project was tested within months of completion as Hurricane Earl passed directly over the island. Neighboring beaches and properties suffered a great amount of damage, while the owner's beach suffered nearly no detrimental effects. Perhaps the most interesting aspects of this project are that it functions in harmony with the carbonate beach and reef system, is visually non-obtrusive and did not require the carbon footprint typically associated with barging rock or sand to the site. The Eustatia Island Beach Restoration project was the first of its kind in the BVI and "is now the poster child for environmentally favorable beach restoration projects in the BVI" as Michael Hahn (property/project owner) has put it. This project has won the 2011 COPRI Project Excellence Award.

Client: MR. MIKE HAHN - OWNER

Designer / Consultant: OCEAN AND COASTAL CONSULTANTS

Contractor: COMMERCIAL DIVE SERVICES

Products used (Qty.)

- MacBag

OS150

Date of construction: 04/2010 - 07/2010



Pre-Project shoreline conditions at dining pavilion



Installation of top row of MacBags on groin



Revetment and groin with MacBags during construction



Condition of beach 5 months post construction



Aerial photo of February 2011 monitoring period