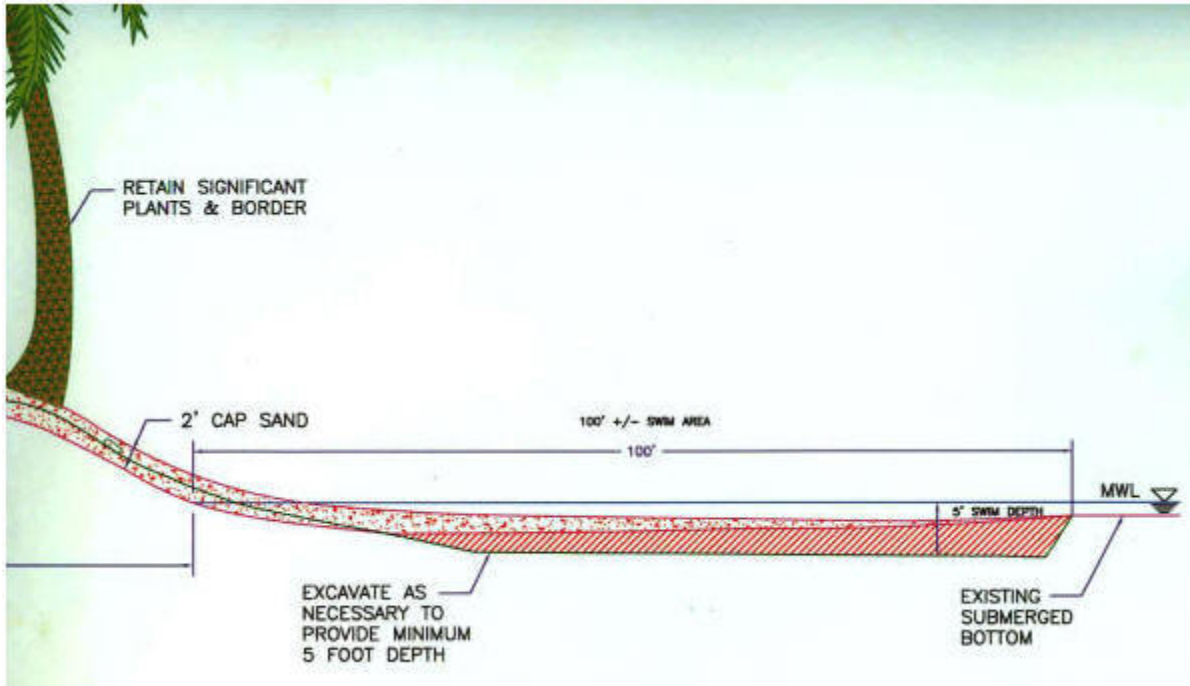


Six Case Study Examples of Beach Creating and Restoration Projects

Managed by: Cliff Juillerat

Before a project can begin, it is important that all of our clients first have a solid understanding of the solutions and options we are proposing in dealing with their problems and needs.



▲ Basic drawing of beach restoration plan



▲ Aerial views of proposed beach restoration and or developments. ▲

Case Study #1

Caribbean, West Indies



Image 1

▲ A view of the beach "before" the restoration project began. Note, the beach rock(s) along the water's edge.



Image 2

▲ Work in progress creating a new, wider beach-front.



Image 3

▲ Placement of non-woven 14 oz. geotextile fabric on the ground of the newly created beach. Width of material varies between 10 > 18 meters wide to 400 meters in length. The geotextile allows water to pass under the new land area without eroding the sand.



Image 4

▲ Construction of beach: 24 meters wide x 400 long

Case Study #1, continued

Beach Renourishment Project - Caribbean, West Indies



Image 3

◀ Renourished beach front running along the property's seawall. -- The seawall was constructed several years prior to the beach renourishment project in an effort to save the wall and protect a new, multi-million dollar swimming pool. The pool was located just behind the palm trees, approximately two meters from the wall. Prior to the project, the seawall was in danger of collapsing per erosion caused by swell waves & storm surges.



Image 4

◀ View taken near the far edge of the new beach



Image 5

◀ View of the new beach, looking toward sea.

Case Study #2

Beach Repair / Restoration Project – Nevis, Caribbean, West Indies



Image 6

◀ Broken groyne



Image 7

◀ Same groyne after restoration & enlargement.
The area was later used as an area
for wedding parties and lunch.

Case Study #3

Beach Creating / Restoration Project – Nevis, Caribbean, West Indies



Image 8

▲ *Side angle view* - beach before beginning the project.



Image 9

▲ *Front view* - beach before beginning the project.



Image 10

▲ *Close up view* - Severe beach erosion was beginning to undermine the soil directly in front of the house (seen in background) and was within one meter of the structure.



Image 11

▲ *Wide angle view* – dwelling and erosion.

Case Study #3, Continued

Beach Creating / Restoration Project – Nevis, Caribbean, West Indies



Image 12

◀ The area *AFTER* the placement of the non-woven geotextile fabric (covered by a layer of sand), held in place by a newly constructed seawall, and *BEFORE* the final placement of cap sand (top surface of the beach.)

The *NEW* beach area is approximately 20 meters wide by 200 meters long.

The seawall was constructed using 3 to 8 m³ boulders, placed at a 3/1 slope angle to send wave energy back seaward thus protecting the dwelling (located just behind the trees on the right side of the image).



Image 15

◀ ...*before* the cap of beach sand was placed.



Image 16

◀ ...*after* the 2 meter sand cap was placed upon the base rocks and geotextile material

Case Study #4

Beach Creating / Restoration Project - St. Vincent & The Grenadiers, Caribbean, West Indies



Image 17

◀ This property had lost over 25 meters of beach front due to storm surge and swell waves. Likewise, the near shore coral reefs had also been destroyed, further effecting the loss of sand and destruction of the beach.



Image 18

◀ This photograph shows the dead coral reef ... notice that the reef rock is completely covered with sand which in turn has blocked sunlight and any potential reef re-growth .



Image 19

◀ Same beach after project completion.

Case Study #5

Beach Creation & Restoration using Biorock Technology & other Soft Engineering Methods

-- Ihuru Island, Maldives

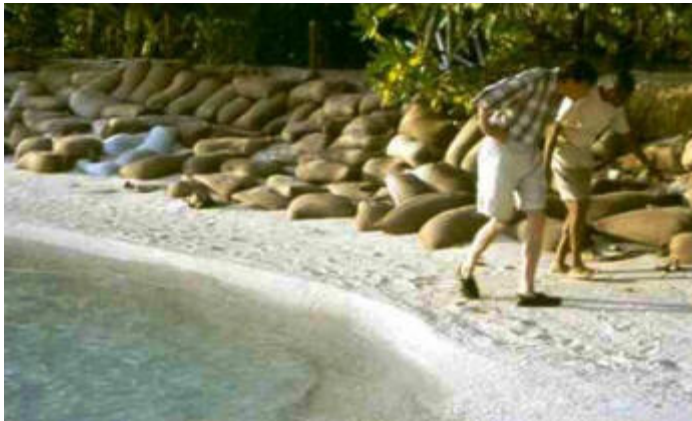


Image 20

▲ Beach and erosion control prior to the start of the project. Sand bags cover a meter high cliff eroded from the sand and the adjoining trees are collapsing over them.



Image 21

▲ Rapid growth of minerals and corals on the Biorock shore protection reef slows down waves and traps sand, thus helping control erosion and increasing the length / width of the entire beachfront.



▲ Image 22

Fifteen meters of new beach *grew* within a few years behind the Biorock shore protection reef. Notice that the sandbags previously used for protection and erosion control, are gone.

The newly grown beach, stabilized behind the Biorock reef (see foreground, dark area in water) and was not affected by the tsunami that passed over the island in December, 2004.



▲ Image 23

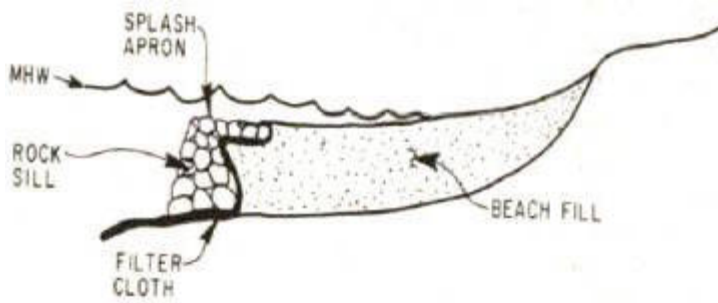
Biorock shore protection reef, Ihuru Island, Maldives.

Case Study #6

Beach Creation & Restoration by creating a Perched Beach - Bahamas

A perched beach...

- creates a wider beach at locations where the natural beach has become too narrow and low due to the erosion of the coastal profile at specific location(s), where the coastline is fixed.
- have many of the same qualities as natural beaches, and are submerged thus, do not intrude on the view of the waterfront.
- are an appropriate erosion control measure where a beach is desired and sand loss is often rapid.



▲ Image 23

Drawing showing the construction features of a perched beach.



▲ Image 24

Compare a non perched beach to a the final results of restoration project utilizing a perched beach.