

### THESEN ISLAND MARINA KNYSNA, WESTERN CAPE, SOUTH AFRICA

#### SHORELINE & OFFSHORE PROTECTION / MARINAS

**Product:** Gabions, Terramesh® System, Reno Mattresses

##### Problem

Thesen Islands development is an ambitious and technically complicated project where the 96-hectare Thesen Island is master planned into an estate of 19 islands surrounded by wide tidal waterways linked by bridges.

Seventeen kilometers of pristine water front property needed to be protected in the most environmentally friendly way possible against the erosive forces of fluctuating tide levels and associated wave action to ensure that the islands were developed in harmony with the Knysna Estuary environment.

25Ha of impacted saltmarsh needed to be transplanted into the development to create an ecobelt, ensuring that the most stringent of the 101 conditions of approval "No nett loss of salt marsh" was met.

##### Solution

The basic design consisted of an underlying geotextile filter combined with a granular filter, overlain by 230mm deep Reno mattress, a 1m x 1m gabion with a double twist mesh panel used as a lid and reinforcement into the backfill and a 170mm deep Reno mattress lined with the an AG200 Geotextile, which formed the basis for the ecobelt. The signatory double twist mesh of the gabions, Reno mattresses and mesh panel was heavily galvanized and PVC coated.

Gabion and Reno mattress combinations were selected as the most appropriate solution because of their flexibility to meet with the geometrical constraints of the canal embankments, durability under harsh marine environments and ability to lend themselves favorably to environmental rehabilitation.

This is the first time ever in South Africa and probably one of few places in the world where indigenous salt marsh plants has been successfully harvested on this scale, and replanted and established at simulated heights and natural conditions.

For further information, refer to Maccaferri's Technical Paper "THESEN ISLANDS: INNOVATIVE ENVIRONMENTAL ADVANCEMENTS IN MARINA DEVELOPMENT", 34th IECA Conference, February 2003.

Client:

THESEN ISLAND DEVELOPMENT COMPANY

Main contractor:

POWER CONSTRUCTION

Consultant:

ARCUS GIBB CONSULTING ENGINEERS

Products used:

GABIONS, TERRAMESH, RENO MATTRESSES

Date of construction

AUGUST 2000 – DECEMBER 2003



Topsiling of Reno mattresses

Date: Oct 2000



Planting of sods

Date: Feb 2002



Planting with salt marsh plugs

Date:



Thesen Island, Aerial View

Date: Feb 2001

## Benefits

- Stockpiled topsoil, from the excavation of the canals was used to fill the voids between the rocks in the Reno mattress.
- The whole area was planted with indigenous salt marsh and grasses to stabilise the new surface resulting in "No Nett Loss of Salt Marsh!"
- Transplantation of the salt marsh was accomplished using two methods:
  - plug planting
  - sod planting
- Both methods were equally successful in the long term but the sod planting method proved quicker and more cost effective with a faster establishment rate.
- Transplanting was carried out using labour intensive methods contributing to the local economy of the area.



Salt Marsh

Date: Feb 2002

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