

PORT ALFRED MARINA
PORT ALFRED, EASTERN CAPE

SHORELINE & OFFSHORE PROTECTION / MARINAS

Product: Green Terramesh®

Problem

Port Alfred Marina, in the Eastern Cape is one of the few pristine sites available on the South African coastline. An up market residential development has been created within the marina area through a series of man-made canals. The canal walls within the marina, were constructed with a wrap-around non-woven geotextile used as the reinforcing component. A loose stonewall was placed at an angle of 80° as a facing component to provide the ambience of tranquillity and serenity for the multi-rand homes, a few metres from the waterline.

Continuous fluctuating tidal levels coupled with the gradual deterioration of the geotextile led to the loss of fines from the backfill material. In addition, scour at the toe of the structure resulted in a loss of foundation support. The geotextile, unable to provide any noticeable resistance to the movement of the backfill material, led to the total collapse of the facing elements of the stonewall in certain areas of the marina.

Greg Till, a property owner at the Royal Alfred Marina, approached Maccaferri for recommendations on how to repair the failed stonewalls at the waters edge of his property.

Solution

Two alternate proposals were proposed to the client; a conventional gabion mass gravity wall and a Green Terramesh® soil reinforced wall. The latter being the preferred option since it complied with the specification of a 60° front face inclination for the marina canal walls.

The solution encompassed removing all the stone facing units down to the mud level and repairing the excessively damaged and exposed geotextile. The Green Terramesh® was then placed in front of the repaired wrap around geotextile. The 1,3m long units were then backfilled with rock. The upper 1,5m of the 3,5m high wall where the wrap around geotextile was completely degraded, was replaced with a modified MacTex N Geotextile.



Before construction

Date: Jul 2001



During construction

Date: Jul 2001



After construction

Date: Sep 2001

Client name:

GREG TILL (PRIVATE)

Consultant:

SYDNEY LEBOVSKY

Product used:

GREEN TERRAMESH®

Construction info:

Construction date:	JULY 2001
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Completion date:	AUGUST 2001
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Loose stone was eventually repacked in front of the units in keeping with the surrounding aesthetics of the adjacent property owners and marina.

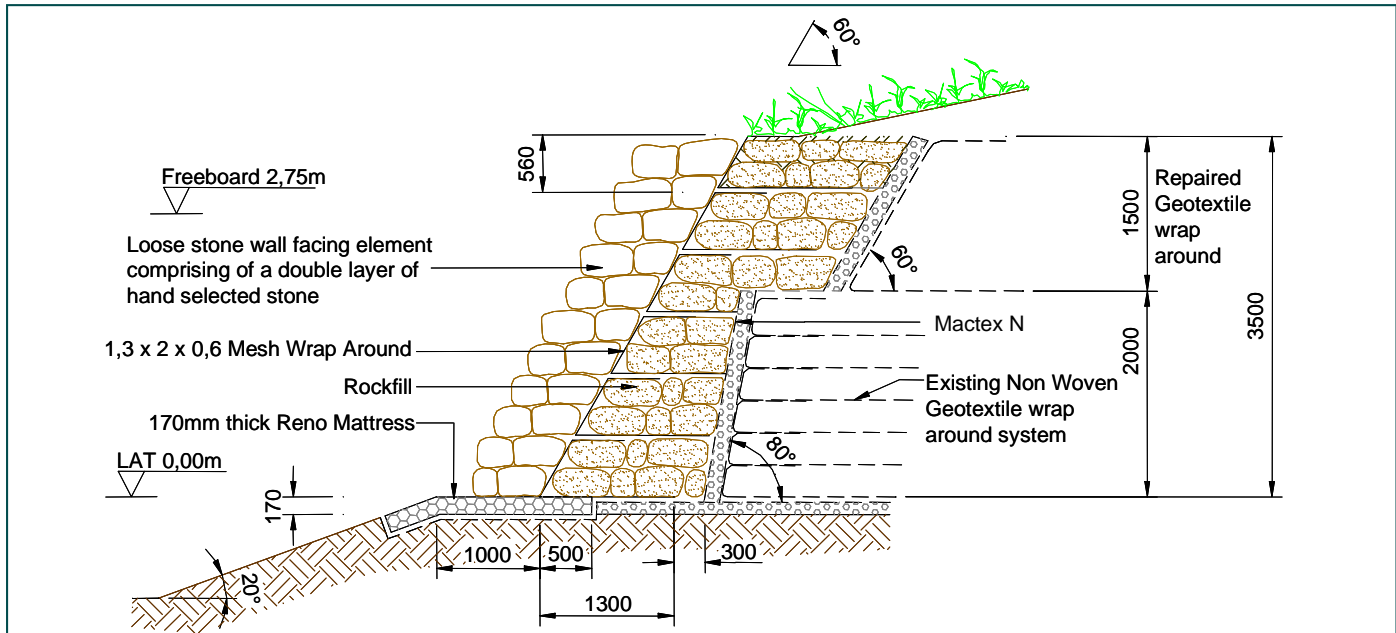
To ensure that foundation support would not be eroded away, a 170mm thick flexible Reno mattress apron was placed at the toe of the structure.

Benefits

The sound engineered solution offered by Maccaferri encompassed:

- **FLEXIBILITY:**
Green Terramesh® manufactured from double-twist hexagonal woven mesh has the ability to permit differential settlement without fracture; an essential requirement since founding conditions varied significantly along the length of the structure from soft rock to estuarine deposits.
- **PERMEABILITY:**
The porous nature of the structure resulting from the use of rock as a fill material, negated any build up of hydrostatic heads behind the structure during rapid draw down arising from tidal fluctuations.
- **DURABILITY:**
To ensure long term performance, all wire used in the manufacture of Green Terramesh® is Class A zinc-galvanised (275g/m²) with an additional 0,5mm extruded PVC layer. The PVC layer provides complete protection to the zinc coating and offers resistance to abrasion caused by sediment.

- **CONSTRUCTABILITY:**
The modular units allowed for easy installation in the wet conditions. Construction of the base layers was done during the Spring Low Tides.
- **SOCIAL BENEFIT:**
Green Terramesh® allowed for local unskilled labour to be used for packing operations contributing financially to the economy of the local area.
- **ECONOMICAL:**
The solution was not only the most cost effective when compared to the stone masonry alternative, but also the most technically sound.
- **TRAINING:**
Certified Maccaferri trainers were provided at the beginning of the project to impart the correct skills and methods for good quality gabion construction.
- **TECHNICAL DESIGN ASSISTANCE:**
Technical design assistance was provided in the form of professional design advice, AutoCAD drawings and site supervision.



Typical Section

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