

### SABI RIVER SUN HIPPO DAM HAZYVIEW, MPULANGA, SOUTH AFRICA

#### LANDFILLS

#### Product: Gabions and Gabion Mats

##### Problem

The Sabi Sun Hippo Dam is located 50m upstream of the confluence of the Langspruit and Sabi Rivers. The dam was home to an array of wildlife species including a family of hippos who had established their home in this 'natural' habitat. The dam not only serves as home to these precious wildlife species but also forms part of the challenging Southern Sun Sabi River golf course resort.

In February 2000, a 385 cumec flood swept through the Langspruit River causing widespread destruction along its path with the Hippo Dam being one of its victims. The raging waters swept the dam away leaving the hippos homeless and the golf course with one less water feature. Reconstruction of their home and golf course feature was imperative. The speed and impact of the construction methods and material types had to be carefully considered in the design of the new dam due to the sensitivity of the surrounding environment.

##### Solution

A 90m wide emergency spillway was constructed across the affected river channel. The spillway was constructed using a 6m wide impermeable clay core with semi permeable upstream embankments. The spillway comprises of eight - 3m wide steps that were concrete capped. Thus providing further protection of the (PVC coated) gabion wire from the supercritical, turbulent flow. The steps lead into a gabion lined stilling basin 10m long and 71m wide.

The stilling basin floor is 1m below the normal river bed level and has a 1m high counter weir downstream of the spillway. Maccaferri's Reno mattresses, incorporating 6x8 mesh, were used to line the stilling basin. 60% of all gabions and Reno mattresses used were PVC coated. The embankment slopes upstream of the weir had a maximum slope of 1:3 but were generally flatter to allow easy access for the hippos. 5000m<sup>3</sup> of gabions were installed in the project, with 36,000m<sup>3</sup> of earthworks and 24,000m<sup>3</sup> of soil being used as backfill and for landscaping.



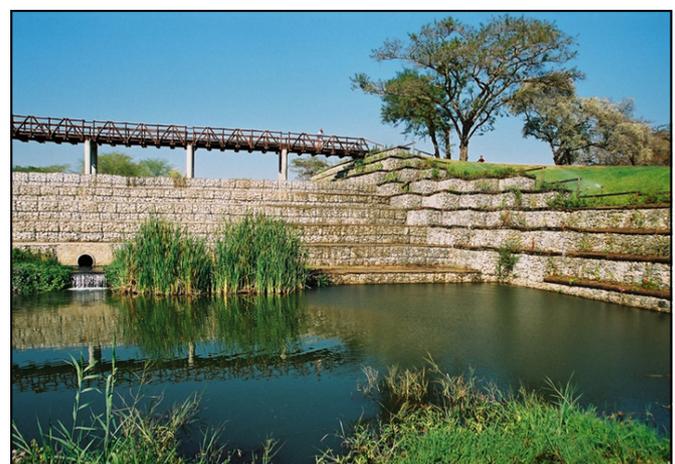
Stilling Basin Construction

Date: Feb 2001



During construction

Date: June 2001



After construction

Date: August 2003

Client:

SOUTHERN SUN SABI RIVER

Main contractor:

FORM FOUR CONSTRUCTION

Consultant:

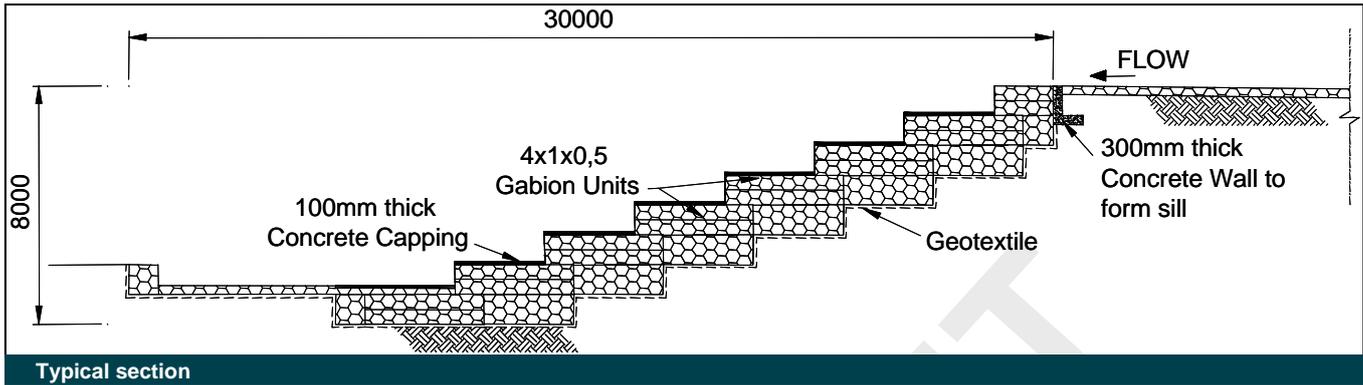
CHRIS BROOKER, PHUMELELA AFRICA

Products used:

5000m<sup>3</sup> GABIONS & RENO MATTRESSES

Date of construction

FEBRUARY 2001 - JUNE 2001



## Benefits

**PVC Coated Wire:** The use of the PVC coated gabion baskets ensures protection of the baskets against corrosion for a longer period of time and in this case up to the 100 year design life.

**6x8 Mesh:** The mesh allows for a greater rigidity of the basket. The strength, mass and cost of the basket is the same as the 8x10 product. Rock with smaller dimensions\* could be used to fill the gabions. This reduced the rock wastage factor on site.

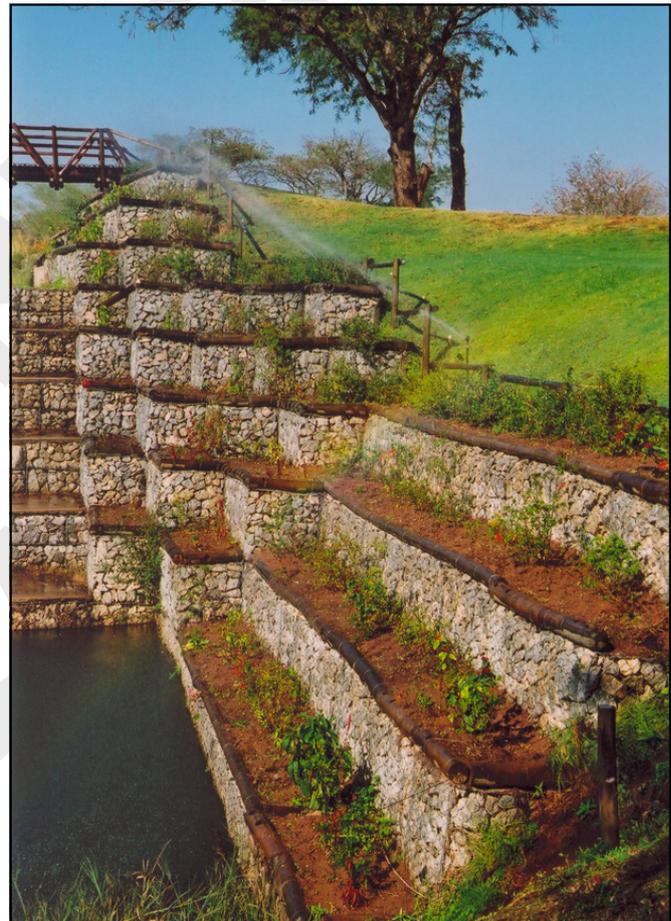
*\*rock dimensions must comply with SANS 1200DK:1995*

**On Site Assistance:** Maccaferri provided one week of intensive on-site training, which allowed the contractors, Form Four Construction, to reach their high productivity rate of 100m<sup>3</sup> per day allowing the 5000m<sup>3</sup> of gabion construction to be completed within the demanding six-month deadline.

**Free Technical Assistance:** Engineer Chris Brooker undertook the design using the Maccaferri in-house software, Macra 2™.

The final design was then submitted to Maccaferri for review. Technical advice and assistance was provided to the engineer throughout the project.

Gabion aesthetics and flexibility allowed the structure to be completed speedily and allowed for an acceptably low impact structure for the surrounding environment. The structure today along with its majestic inhabitants has been restored to its former glory, using products from Maccaferri – the environmental solutions company.



Wing Wall "Greening"

Date: Aug 2003

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