

PROTECTION OF THE YONNE RIVER BANKS ECLUSES DE VILLEPERROT, BURGUNDY, FRANCE

HYDRAULIC WORKS

Product: Gabion mattresses

Problem

The Yonne is a river in France and is a left tributary of the Seine. It is 292 km long, the 16th longest river in France and has its source in the Morvan hills near Chateau-Chinon.

In 2009, the Voies Navigable de France who is in charge of the maintenance of the river, begun renovation works on three main locks on the Yonne. These locks are located at Vinneuf, Villeperrot and Saint-Bond. The purpose of these upgrades works was to facilitate river traffic of goods on the Yonne where the demand was growing (aggregates and cereals), and then enable the passage of containers in the future.

The increase in use of the river and the ongoing degradation of the river banks required an intervention to limit the hydraulic impacts.

Solution

The solution was to protect the sloping banks which had a slope profile of 1 in 2 on average.

Gabion mattresses were selected as the ideal solution:

- Proven intervention in river hydraulic works
- Durable and long lasting
- Flexible and can accommodate differential settlement

A key feature of Reno and gabion mattresses is their ability to reintegrate back into the environment, whilst still providing long-term erosion protection. The voids between the rock fill within the mattress quickly accrete soils and seeds. Vegetation quickly follows and the river bank can be soon inundated with plants.

In order to install the mattress protection works the water level of the channel needed to be low enough to access to the whole bank. This constrained the construction phase to the period of time when the river water level was low enough and the channel was not being used.

Client:

VOIES NAVIGABLES DE FRANCE-STRASBOURG
(67)

Main contractor:

VOIES NAVIGABLES DE FRANCE-STRASBOURG
(67)

Company:

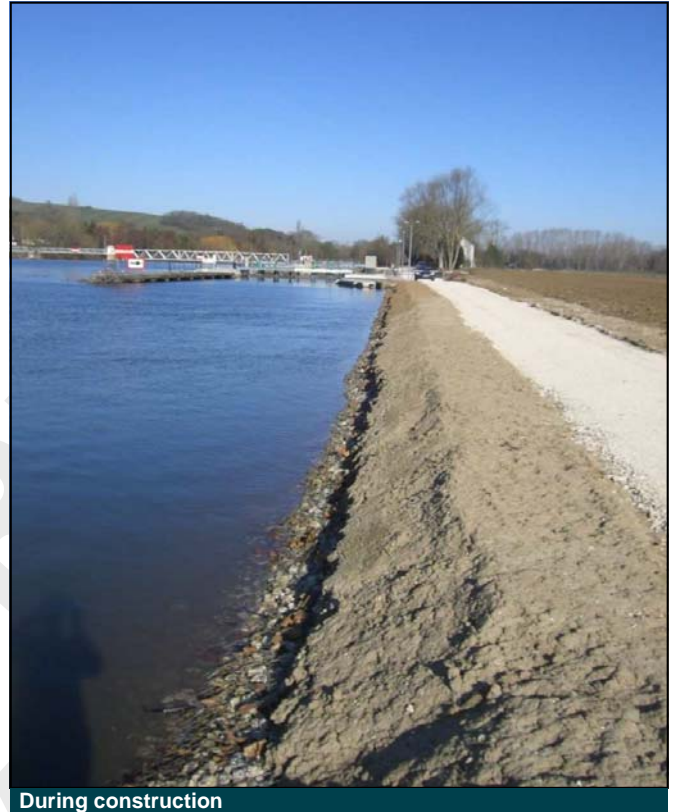
CHARIER TP-BONNEUIL SUR MARNE (94) FRANCE
MACCAFERRI-VALENCE (26)

Products used:

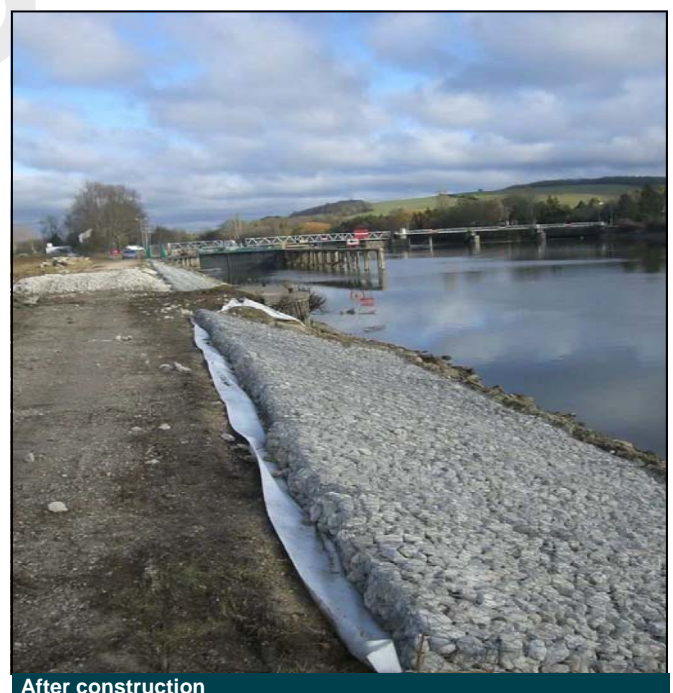
800m³ GABION MATTRESSES

Date of construction

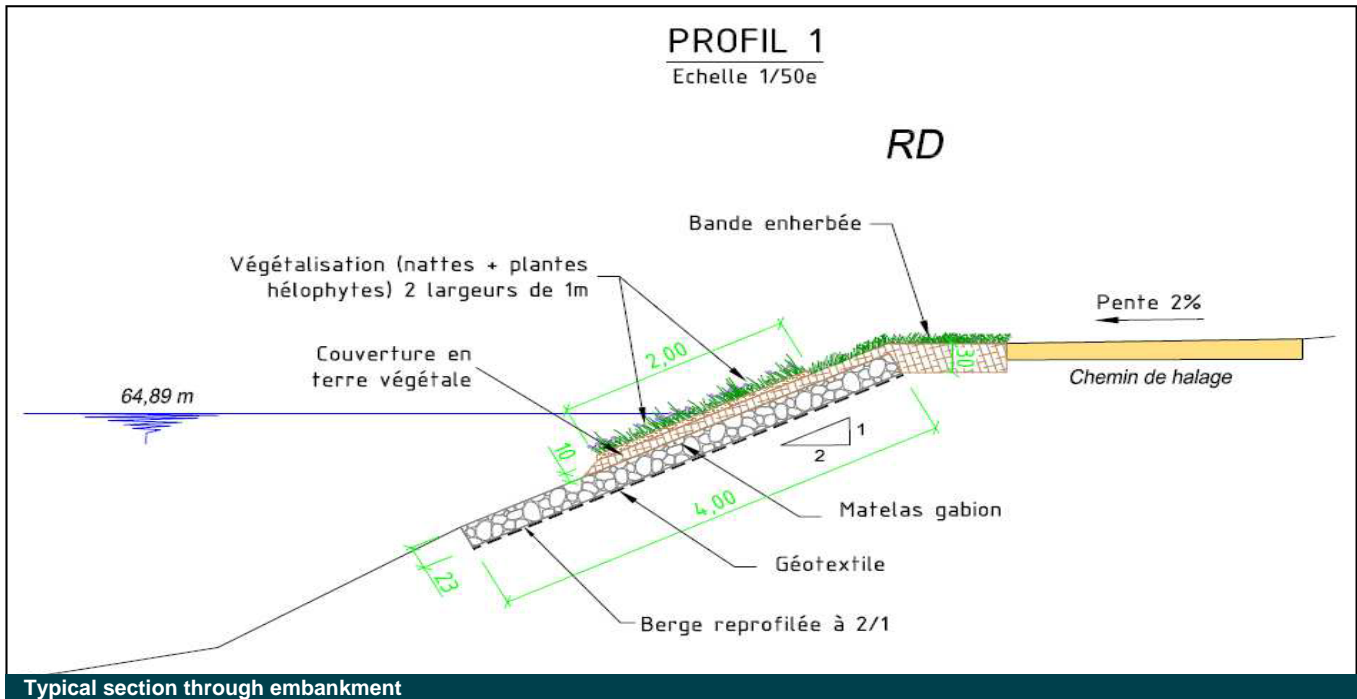
NOVEMBER 2009-DECEMBER 2009



During construction



After construction



Maccaferri Reno and gabion mattresses are cages, engineered from double twisted hexagonal woven steel wire mesh. Delivered flat-packed, they are assembled and then filled with stones at the project site to form flexible and permeable, monolithic structures such as river bank protection and channel linings for erosion control. They are divided into uniformly partitioned cells by internal diaphragms.

A geotextile is installed between the existing river bank and the protection mattress. This limits the wash out of fine-soils under the hydraulic action.

Being made of flexible double twisted wire mesh, the mattresses can accommodate differential settlements without sustaining damage, unlike rigid (e.g. welded wire mesh mattresses) or impermeable revetments (concrete or pumped concrete mattresses).

Maccaferri's Reno and gabion mattresses are made from high quality steel wire, which is heavily galvanised to provide long term corrosion protection. An additional protective polymeric coating is also applied when the units are to be used in more aggressive environments, or where a longer design life is required.



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