

EMERGENCY EMBANKMENT SAMOGGIA RIVER, BOLOGNA, ITALY

EMERGENCY WORK

Product: FlexMac® DT

Problem

The Samoggia river is located in Northern Italy, where it also is a tributary to the Reno River.

On 9th October 1996 the left embankment of the Samoggia River between Sala Bolognese and San Giovanni in Persiceto, in the district of Bologna, failed due to three landslides allowing more than 7,500 m³ of water to escape through the breaches.

In addition to the disastrous flood in 1966 in the same area, there have been nearly 15 breaches during the past 60 years; the hydrogeological conditions of the area are still a problem for the Soil Defence Service of the Emilia Romagna Region.

Various other geotechnical problems had also caused the partial lowering of the right embankment which, in a specific strip of land of about 150m in length, was approximately the same height as that during the October 1996 flood.

Solution

As a consequence of this potentially dangerous situation it was decided to construct a temporary bank to form part of the final bank enlargement scheme, intended to avoid further flooding during very high flow levels.

The temporary bank needed to be built quickly and it was therefore decided to use FlexMac® DT, rather than traditional sand bags, due to its large size, speed of installation and simplicity. The embankment was raised using the FlexMac® DT units and then the ground on the embankment raised to meet the new crest height.

FlexMac® DT elements are modular structures made from double twisted, heavily galvanized steel wire mesh panels, reinforced with vertical steel bars. The cells are connected together in the factory and then folded to reduce shipping volume and facilitate rapid deployment.

Each cell within the FlexMac® DT unit is lined with a geotextile which is fastened to the double twist wire hexagonal mesh during the manufacturing process. The FlexMac® DT elements arrive on site in bundles wrapped in plastic for protection during freight and storage.

The transportation of the single FlexMac® DT unit is very simple and can be done manually. To deploy a single unit requires only 2-3 people and 20-30 seconds.

FlexMac® DT modules can be filled with many types of fill material and can be done either manually using shovels or mechanically using suitable mechanical plant on site.

Client:

COMUNE DI SAN GIOVANNI IN PERSICETO

Products used:

FLEXMAC® DT

Date of construction

October 1996



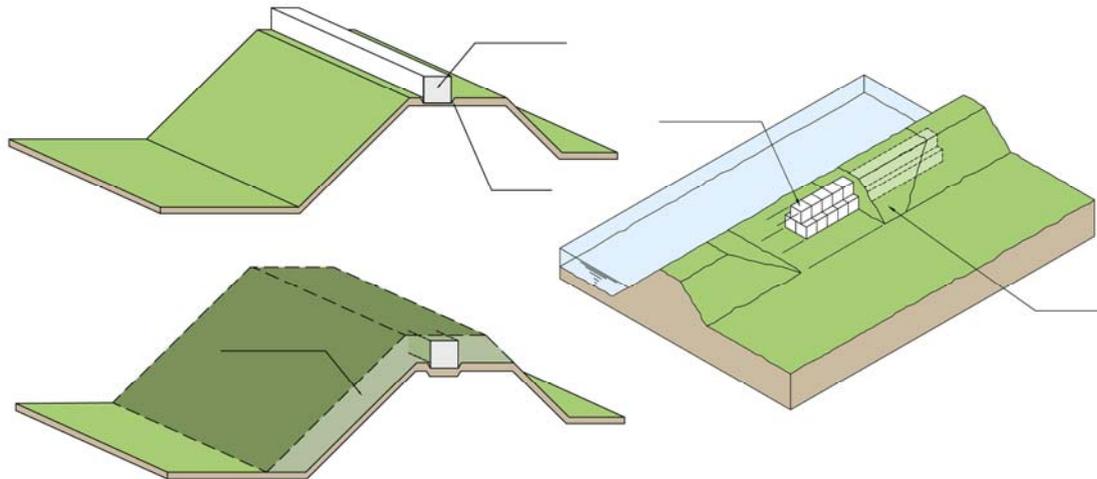
Manual transportation of the unit if necessary



Deployment of a 5m long unit takes less than 1 minute



Filling with an excavator



Typical schematic of embankment raising solution

The 140m long length of FlexMac[®] DT required, was placed and filled in only four hours using 5 people and an excavator.

In parallel with these works, a demonstration was performed to illustrate the speed of installation of a 1m high embankment using FlexMac[®] DT compared traditional sandbags.

In three hours, 30 people built a 1m high, 10m long structure using sandbags. In the same 3 hours, 5 people built a 60m long structure using FlexMac[®] DT elements

At the end of the demonstration the sandbags were removed and replaced by 10m of FlexMac[®] DT.



FlexMac[®] DT vs sandbags demonstration



FlexMac[®] DT at the crest of the embankment



Seepage protection with FlexMac[®] DT elements

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