

Rebuilding of the Grand-Rhône dyke

France

Project owner

Syndicat Mixte Interrégional
d'Aménagement des Dignes du
Delta du Rhône et de la Mer
(SYMADREM)

Product

EnkaDrain® 5004F/T165PP

Functions

Drainage, filtration and separation

Contractors

Guintoli, TP Spada, Crozel,
Masoni, SLTP

Volume

130 000 m²



The downstream part of the Rhône and its delta in the Camargue are protected by old dikes. Due to exceptional flood in December 2003, it was decided to reinforce these structures. EnkaDrain solution was applied as drainage and filtration system between upstream and downstream dyke fill.

Challenge

Led by the feasibility study SYMADREM chose to completely rebuild the dyke in order to achieve optimal reinforcement. The design of the new dyke consisted of a low permeable embankment on the side of the river, a less technical embankment on the land side, an anchoring key to the axis of the structure and a filtration and drainage system interfacing the embankments (Fig.1). The filtration and drainage system is designed to significantly increase the safety of the structure against the risk of internal erosion in the event of failure of the upstream sealing fill material (cracks or possible galleries).

Solution

Three filtration and drainage systems were considered and compared during the project feasibility study for the downstream part of the dike:

- a 70 cm thick drainage layer made of self-filtering sand materials, respecting filter rule
- a granular drain wrapped in geotextile
- EnkaDrain geocomposite ensuring drainage, filtration and separation functions in a single product

This latest solution, cheaper, was selected by SYMADREM.

Benefits of the solution

The technical and economical benefits of the EnkaDrain solution vs self-filtering sand or granular materials are as follows:

- Installation of this solution is a lot easier due to the fact that the geocomposite ensures the three functions filtration, drainage and separation in a single product

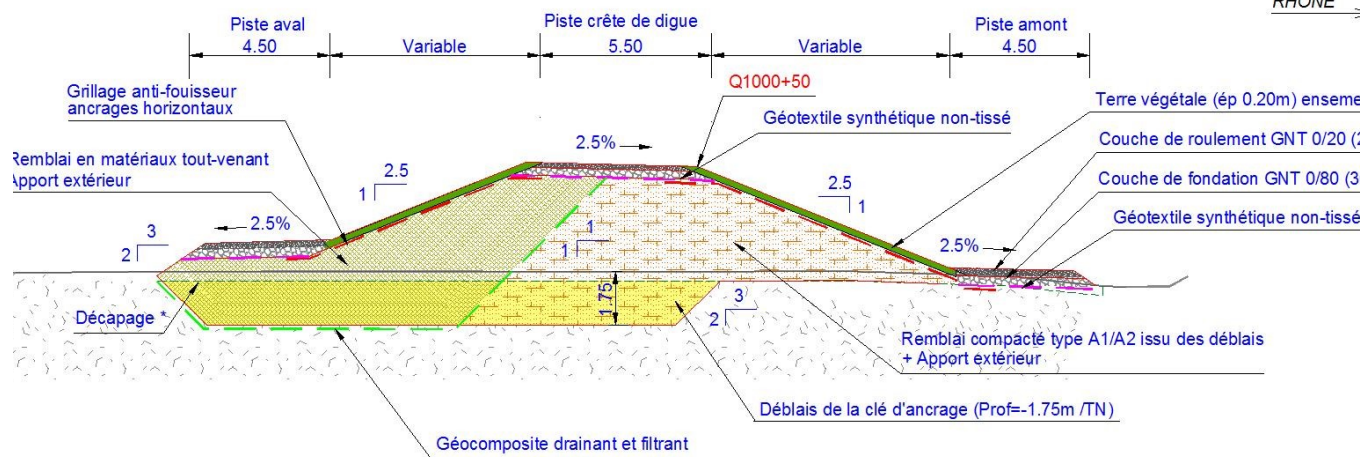


Figure 1: Typical cross section of the new dyke

- A much better guarantee of the good functionality of the system as industrial solution manufactured under ISO 9001 certified quality management system, CE marked according to EN 13 252 with minimum presumed durability of 100 years
- The cost of the structure is reduced due to the installation speed and the absence of clean sand or crushed draining materials (not compensated by the additional cost related to the added volume of downstream common fill materials)
- Preservation of quarry materials resources, 70 000 m³ of draining materials would have been needed on the linear of the project
- A limitation of CO₂ emissions and nuisances due to the proximity of the quarries supplying common materials, closer than the quarries of draining granular materials: this resulted in saving of approximately 250 000 km of heavy truck journeys with the geosynthetic solution

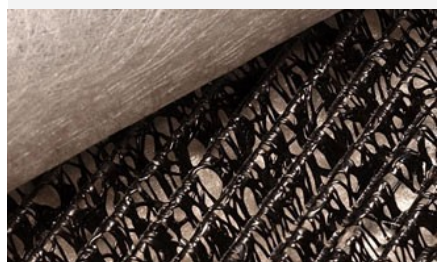
Installation benefits

- Time savings with a single geosynthetic to unroll instead of the both needed in the granular drain solution and no installation of draining materials
- Easy installation of a product that is light and easy to unroll with a spreader bar, compared to draining materials that are difficult to install on a small thickness on slopes, requiring an adjustment with GPS and a shovel with big arm
- No storage management, supply and recovery of materials

Result

Under load of 100 kPa, the EnkaDrain geocomposite provides a water flow capacity in the plane greater than that of a sand layer 70 cm thick with permeability 10⁻⁴ m / s. The EnkaDrain solution has thus enabled the project owner to increase his structure safety at lower cost than that of a granular layer, while reducing the impact of the works on the environment.

Products used



EnkaDrain® Wide

Drainage geocomposite with V-shape monofilament structure stitched to two nonwovens

China	+86 519 6858 5555	Hungary	+36 23 610 870
France	+33 1 74 90 00 13	Netherlands	+31 85 744 1300
Germany	+49 6022 812020	USA	+1 800 365 7391

Disclaimer

The information set forth in this brochure reflects our best knowledge at the time of publication. We have a policy of continuous development and therefore our products, information and specifications may be subject to change. We therefore advise you to contact us to make sure the information you receive is accurate and actual. We do not accept any liability arising from the application of these products, the results thereof or the information given in this document. © 2018 Low & Bonar