The Canal of Mornos.

One of the important water supplies for the city of Athens comes from the Mornos reservoir through the canal of Mornos with a storing capacity of 450.000 m³. The total length of the canal of Mornos is 188 km.

The concrete aqueduct was built some decades ago.

Due to cracking of the concrete, leakages are observed as a result of inevitable swelling of clay foundation layer during the winter season and shrinkage during the summer period in relation with the high underground water table and the inadequate drainage system. These damages leaded to major loss of the important water for the city of Athens. The most important losses were observed in the region of Thiva, a section of canal with a length of 39 km.

Studies for repair were already started in 1990.

The company Alkor Draka (now RENOLIT Group) already proposed at that time a solution with geomembranes.

In the year 1998 the project over a section of 12,48 km started to be executed. It is built in order to restore the waterproofing of the canal resulting also to the stability of the aqueduct in eight different locations with a total length of 13,7 km, and includes the works inside the canal, the temporary by-pass canal as well as the constructions outside the Thiva canal.

Installation of the steel frame to deviate the water to the by-pass canal

The main work consisted of: The main work consisted of:

- Cleaning of the canal bed with flushing of high pressure water.

cleaning under high pressure

- Repair of the expansion joints and cracks with the use of synthetic mortars and elastomeric materials.

- Demolition and reconstruction of parts of the canal concrete lining where necessary.

Repair of broken concrete zones.

- Surface levelling with the use of synthetic mortar or high strength cement mortar.

- Construction of special concrete discharge chambers in the bed of the canal for the collection of water due to leakages towards the existing culverts.

- Placing of a synthetic geogrid on the canal bed and parts of the wall.

geo-grid as drainage under geocomposite in bed of the canal

- Installation of the elastic water proofing with a geocomposite of PVC in a thickness of 2,5 mm + a geotextile of 500 g/m²

The preparative works were executed by the main contractor ARCHIRODON HELLAS S.A. The technical solutions were followed up through the company BAST GmbH. The water proofing product was designed by ALKOR DRAKA, now **RENOLIT AG**.

The installation of the water proofing system:

- Prefabrication of wide panels of geocomposite outside the canal. The geocomposite was delivered in length of 55 m and a width of 2,05 m. 2 rolls of geocomposite were welded together with a hot wedge machine and transported to the site. With the help of a lifting device the prefabricated panel was brought into position in the canal bed.

- Due to the slope of the walls the geocomposite was placed one by one on the walls.

- In straight sections the geocomposite was installed in longitudinal, in curves in transversal way.

- To execute a watertight fixation on top of the slope a homogeneous geomembrane was used as last part of the waterproofing system.

- Further fixations in longitudinal directions were executed in the middle and on both sides of the bed of the canal.

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Installation of the waterproofing system

The project was delivered to the client in time. All works were executed following the specification to the satisfaction of the client.

Controls of the geocomposite show, that the material is absolutely fit for use and fulfils its task in perfect way.

For further information:

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