



SIKA AT WORK

WATERPROOFING OF HYDROELECTRIC POWER PLANT BUFFER RESERVOIR, PORTUGAL

WATERPROOFING: Sikalastic®-6100 FX
CONCRETE REPAIR: SikaEmaco® S 5300
JOINT SEALING: Sikadur® Combiflex®-930 / -933

WATERPROOFING OF HYDRO-ELECTRIC POWER PLANT BUFFER RESERVOIR IN PORTUGAL





PROJECT REQUIREMENTS

The island of Madeira has traditionally relied on imported fossil fuels for electricity, with renewable sources contributing only about 31% to its energy mix. To address this, the Calheta hydroelectric power plant was to be upgraded to increase the share of renewable energy to 50% by 2022. This upgrade involved enhancing the plant's capacity from 17.7 MW to 30 MW.

As part of these works, a new, 70,450 m³ reservoir would be constructed at 654 meters above sea level, designed for water retention and energy storage. This would facilitate energy transfer to the higher Pico da Urze reservoir at 1345 meters. The 20 m-deep reservoir construction used a reinforced concrete slab and sprayed concrete walls.

To ensure complete impermeability, a comprehensive waterproofing strategy was essential, encompassing a durable membrane and meticulous expansion joint treatment. This would protect the reservoir against leaks, assisting with Madeira's renewable energy ambitions.

SIKA SOLUTIONS

Sikalastic®-6100 FX was chosen for the membrane spray due to the benefits it offered: long-term UV stability, excellent crack-bridging performance even under extreme temperatures, and quick and easy application. It also offers a reduced environmental impact compared to other liquid waterproofing membranes, such as two-component elastic cementitious slurries. Sikalastic®-6100 FX saves approximately 12 tons of waterproofing material. compared to the use of alternative two-component cementitious waterproofing membranes)

Prior to the application of the waterproofing membrane, the sprayed concrete walls and slopes were reprofiled and levelled using SikaEmaco® S 5300 structural repair mortar. Like Sikalastic®-6100 FX, SikaEmaco® S 5300 is a low consumption material. This means lower material and transport costs from the mainland, as well as quicker application. Additionally, all edges were rounded to ensure the durability of membrane. Wall-to-wall and wall-to-floor joints were treated with Sikadur® Combiflex®-930 tape and bonded to the substrate using Sikadur® Combiflex®-933 adhesive.

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Sikalastic®-6100 FX membrane spray was then applied to waterproof the structure, with an average total thickness of 3 mm. Sikalastic®-6100 FX was also used as a finishing layer for vertical surfaces. To avoid mechanical damage from traffic, the waterproofing membrane that was applied on the ramps was protected by 20 cm-thick reinforced concrete slabs. In total, a surface area of 8,700 m² was waterproofed, including 5,400 m² of walls and runways and 3,300 m² of slabs and ramps.

SIKA PRODUCTS

- SikaEmaco® S 5300
- Sikalastic®-6100 FX
- Sikadur® Combiflex®-930 / -933

PROJECT PARTICIPANTS

Project Owner: Empresa de Electricidade da Madeira
Applicator/Contractor: ISOTEXSA / AFAVIAS
Sika Organization: Sika Portugal

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