Leibis-Lichte dam





SHORT DESCRIPTION

Construction of the new Leibis-Lichte dam

THE PROJECT

From a technological and logistical perspective, the construction of the Leibis-Lichte dam is a truly remarkable project that not only meets the high safety standards required for dams in Germany, but also encompasses the ecological and social aspects of the World Commission on Dams (WCD). The dam is primarily used to supply drinking water, but it also functions as flood protection and can be used to generate electricity.

SERVICES IN DETAIL

- It is situated in the forests of Thuringia, above the settlement of Unterweißbach, with a drainage area of 72 square kilometres. The reservoir can hold 39.2 million cubic meters of water and has a surface area of 1.2 million square metres when completely full. The 102.5-metre-high concrete dam wall is 81 metres long at its base. Its crest is 370 metres long and nine metres wide.
- On the air side, the dam wall is inclined at a gradient of 1:0.78. It is completely vertical on the water side. The dam has an overflow structure with a spillway, which is designed to withstand 10,000 years of inundation at 86.5 cubic metres per second. Once complete, a grout curtain was injected beneath the dam wall to depths of up to 30 metres. The water is extracted from the reservoir via five inflow mechanisms and drives a Francis turbine before being carried through a ten-kilometre tunnel to a drinking water treatment plant. The dam also has three bottom outlets with a capacity of 35 cubic metres per second, from which water can also be fed to the treatment plant as needed.
- The dam wall was built using block construction. The 1,150 concrete blocks have standard dimensions of 2.5

metres high, 10 metres long and 30 metres wide. On the water side, there are two layers of joint tape between the blocks in order to prevent leaks in the dam. In order to ensure that the required concrete quantity of 1,400 cubic metres per day – and up to 2,500 cubic metres at peak times – could be supplied, two concrete mixing plants were installed with a rated output of 180 cubic metres per hour each.

- 100,000 tonnes of cement and 30,000 tonnes of fly ash were needed to produce the concrete. The cement content was 120 kilograms per cubic metre for the core concrete and 150 kilograms per cubic metre for the face concrete. During construction, the concrete had to be cooled so that its temperature could be kept within the prescribed tolerances. Ice was added to the concrete for this reason, with up to 2.9 tonnes of ice being used on the construction site every day.
- The concrete was put in place using two cable cranes that operated independently of one another, each with a load-carrying capacity of 20 tonnes. Within the blocks, the concrete was distributed and compacted in 50-centimetre-thick layers using bulldozers.

CHALLENGES

Construction and installation of up to 2,500 cubic metres of concrete per day

FURTHER INFORMATION

- Technical management: Bilfinger / Implenia Construction GmbH, north-east branch, Berlin agency (25% stake)
- Commercial management: Max Bögl Bauunternehmung GmbH & Co. KG (25% stake)
- Joint venture between Bilfinger / Implenia Construction, Bickhardt Bau AG, Max Bögl Bauunternehmung GmbH & Co. KG, Oevermann GmbH & Co.
- Project management: North-east branch, **berlin.construction@implenia.com**

FACTS

Location	Unterweißbach , Germany
Status	completed
Construction volume (value of our services)	18.25 M EUR
Start of construction	December 1999
Completion	December 2006
Contracting entity	Thüringer Fernwasserversorgung, Erfurt
Planning	HPI – Hydroprojekt Ingenieurgesellschaft, Weimar
ARGE	✓
Concrete volume	620000 m^3
Height	102 m
Length	370 m

SERVICES

- Concrete construction
- Industrial construction
- Structural engineering
- Water and sewage plant construction

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