



Carpenters building the gatehouse around 1912

Dam rehabilitation

Klingenberg Dam had been in continuous operation for almost 100 years and was in urgent need of restoration. The August floods of 2002 had also left their mark. Among other things, the spillway was massively damaged. The rehabilitation of the dam began in 2005 and was completed in 2013 after eight years of construction. The costs amounted to around 85 million euro.

Substitute water supply during the construction period

The rehabilitation of Klingenberg dam began with the construction of a 3.3 kilometer-long flood gallery. Since the reservoir had to be completely emptied for the restoration of the dam wall, the gallery was used as a substitute water supply during the construction period. Water was taken from the pre-dam and channeled through the gallery to the downstream side of the dam.

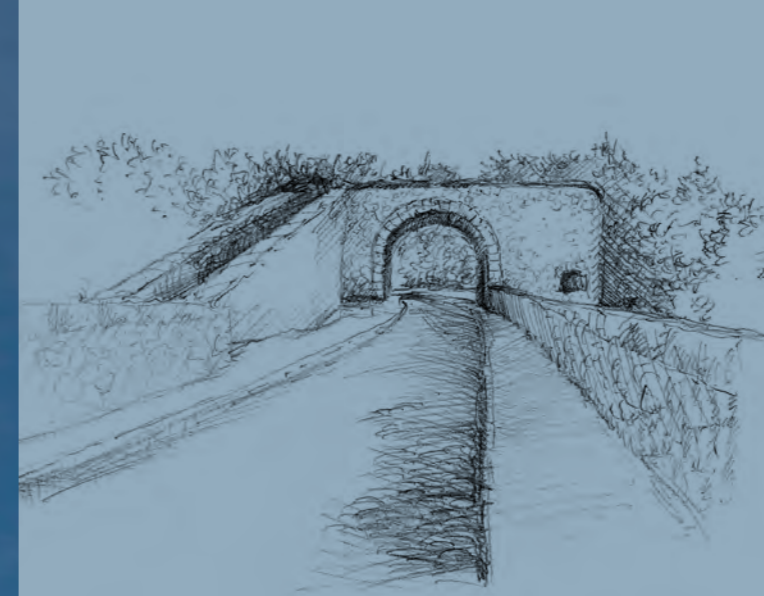
The pre-dam was almost completely destroyed in the 2002 flood and had to be rebuilt. The new pre-dam is about ten meters high, four meters higher than its predecessor. This increased the capacity of the pre-dam from 40,000 cubic meters to 240,000 cubic meters.

To ensure the drinking water supply for the Dresden and Freital regions, the Eastern Ore Mountains Dam System was connected to the Central Ore Mountains System. Water from Rauschenbach Dam can now be piped via the Freiberg Mines Water Management System to Lichtenberg Dam and from there to Klingenberg. This connection still exists today. It strengthens the security of supply by Klingenberg Dam in times of drought.

Restoration of the main dam

The restoration of the nearly 100-year-old masonry dam wall took about three years. The main dam was brought up to the latest technical standards and the capacity of the spillway was increased. On the upstream side, the dam received a new sealing and drainage system. The old intake tower was demolished and replaced by a new multi-level intake tower. The crest of the listed dam wall was partially dismantled and rebuilt true to the original. The masonry dam wall on the downstream side was cleaned and completely regouted in 2006.

In addition, an inspection gallery was blasted into the dam. The blasting was carried out under maximum storage. That means, that the reservoir had a water level of 30 meters during blasting. The inspection gallery is two meters wide, 2.80 meters high and 200 meters long. It contains measuring equipment necessary for monitoring the dam, such as pendulum plumb lines and uplift pressure-measuring instruments.



Klingenberg Dam
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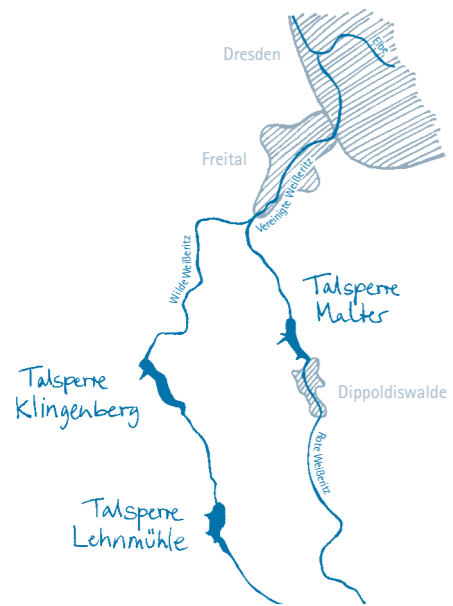
Construction and repairs

- 1908–1914** Construction of the dam
- 2005** Start of dam rehabilitation
Construction of new inflow gauges
Construction of new driftwood barrier
- 2006** Inspection gallery blown into the dam wall
- 2007** Completion of the 3.3 km flood gallery
- 2008** Completion of the new pre-dam
- 2009** Completion of the spillway
- 2010** Start of restoration of the main dam
- 2013** Completion of dam rehabilitation after eight years of construction



Restoration of the historically protected masonry dam wall





Klingenberg Dam

Klingenberg Dam is a drinking water reservoir in the Eastern Ore Mountains. It is an early masterpiece by the famous architect Hans Poelzig. The dam was built between 1908 and 1914. In honor of the last Saxon king it was named originally Friedrich August Dam. The dam owes its construction to the immense damage caused by the flood of 1897 in the river valleys of the Eastern Ore Mountains. This was also a time when industry was moving into the Dresden area and the demand for drinking and process water was growing rapidly.

Today, Klingenberg Dam, along with the Lehmühle, Rauschenbach and Lichtenberg dams, supplies drinking water to large parts of the Saxon Switzerland Eastern Ore Mountains district, the city of Freital, and around 60 percent of the city of Dresden. It also serves as flood protection.

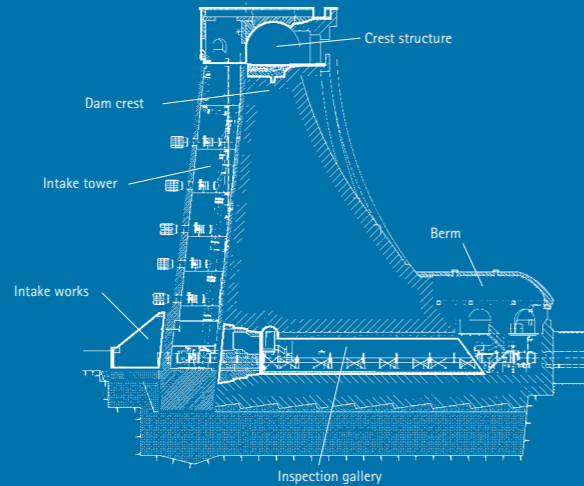
For almost 100 years the dam was in continuous operation. From 2005 to 2013 the State Reservoir Administration of Saxony restored it in one of its largest construction projects.

Klingenberg Dam has always been a popular destination in the region. As it is a drinking water reservoir, swimming and water sports are not allowed. But the charming area surrounding the dam is ideal for hiking and biking. A circular hiking trail leads around the entire reservoir. The path on top of the dam wall is open to the public.

Technical data

KLINGENBERG DAM	
Location	Klingenberg, Eastern Ore Mountains
Construction period	1908 to 1914, commissioning 1913
HYDROLOGY / USAGE	
Dammed stream	Wilde Weißeritz River
Total catchment area	89 km ² (of which 12.3 km ² are located in Czechia)
Raw water discharge capacity for waterworks treatment	31.5 million m ³
RESERVOIR	
Reservoir capacity	17.1 million m ³
of which active and reserve storage	14.1 million m ³
Flood retention storage	1.98 million m ³
Water surface area	1.2 km ²
DAM STRUCTURE	
Crest length / width	310 m / 6.2 m
Height above valley floor	36 m
Height above foundation	40 m
Structure volume	118,000 m ³

Cross section of the dam



Dam with spillway

Dam structure

The structure of the Klingenberg dam is a so-called gravity dam, which relies on its own weight to withstand the water pressure. The curved masonry dam wall is approximately 40 meters high measured from the foundation and 310 meters long at the top. It is a protected monument.

The foundation of the dam consists of medium to coarse-grained, dark gray biotite gneiss. A typical design at the time was an Itze wedge – a pre-fill at the base of the wall. This served to seal the subsoil. During the restoration it was replaced by a grout curtain. To achieve this, holes were drilled up to ten meters deep into the subsoil. A cement suspension was injected into the holes. This seal prevents flow from behind the seal wall.

Inside the dam is an inspection gallery, which is two meters wide, 2.8 meters high, and 200 meters long. Measuring instruments necessary for monitoring the structure are installed here.

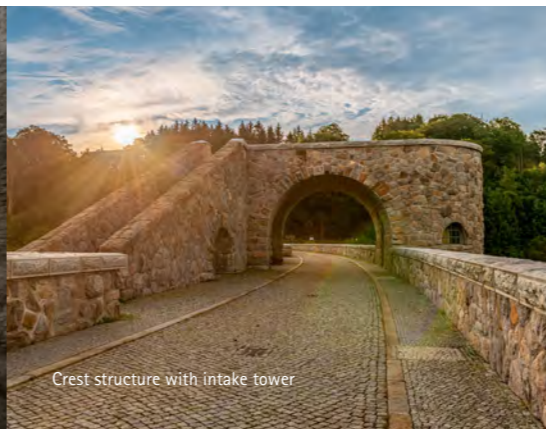


Inspection gallery with measuring equipment

Water draw-off

Today, Klingenberg Dam has fully upgraded hydro engineering equipment. In the new intake tower raw water can be extracted from six different levels. This ensures that the waterworks in Dresden Coschütz and Klingenberg receive raw water of the highest quality.

The head of water in the dam can be regulated by two operating outlets as well as the bottom outlet gallery. The operating outlets can be closed by drop weight flaps on the upstream side, and are regulated by plunger valves on the downstream side. At maximum storage they can each release about seven cubic meters of water per second into the Wilde Weißeritz River. The rebuilt bottom outlet gallery can discharge an additional 30 cubic meters per second. The output quantity is controlled here by radial gates.



Crest structure with intake tower



Klingenberg Dam's pre-dam

Flood relief

Flood relief begins when the flood storage exceeds capacity. The 50-meter fixed spillway is located on the left side of the dam and is regulated by a tilting weir – also called fish belly flap. Connected to this are the collecting channel, the cascade, and finally the spilling basin. The plant can discharge a volume of 170 cubic meters of water per second. A flood gallery with a length of 3.3 kilometers is also used for flood relief. It can take up to 30 cubic meters of water per second and channel it past the dam.

Water quality

The water quality in the reservoir is constantly monitored. In addition to regular sampling, automatic survey stations in the dam itself and at the inflow of the pre-dam are part of this monitoring. Quality control is also carried out in the catchment area at regular intervals. About ten percent of the catchment area of Klingenberg Dam is located in Czechia.

A pre-dam and the two forebays Röthenbach and Hennersdorf keep pollution out of the main reservoir. Turbid matter settles there, so that the water is pre-cleaned. In the 2002 flood, the old pre-dam was almost completely destroyed. The new one is about ten meters high – four meters higher than the previous pre-dam.