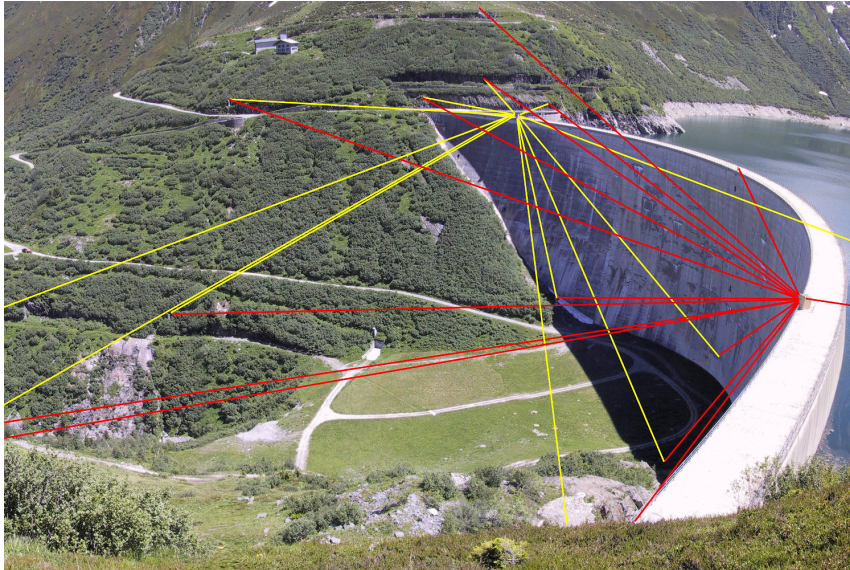


AlpTransit Gotthard Dam and Terrain Monitoring

Permanent monitoring of dams and their surroundings since the construction of the Gotthard Base Tunnel



During tunnel construction, drainage of the rock can lead to subsidence on the surface.

The route of the 57-kilometre Gotthard Base Tunnel passes under the catchment area of the three reservoirs of Curnera, Nalps and Sta. Maria in the Grisons Oberland. Theoretical studies have shown that surface subsidence of up to 5 cm could occur in this area during the tunnel drive. To minimise the risk to the dams, a very extensive monitoring system was installed to monitor the dams and their surroundings for changes in the millimetre range throughout the year. The monitoring placed very high demands on the weather resistance and winter suitability of the measuring systems (approx. 2,000 m above sea level).

The tachymetric measuring systems at the Nalps and Sta. Maria dams (2 total stations each) were taken over from the dam owner and operator, Axpo AG, by AlpTransit Gotthard AG in 2016 and their operation continued.

In summer 2020, these measuring systems celebrated their **20th anniversary** – probably the longest continuously operating total station monitoring in the world!

- 📍 Gotthard Region, Switzerland
- 👤 AlpTransit Gotthard AG & Axpo AG
- 🕒 2000 - ...

Services

- ◆ Fully automatic and continuous monitoring of the valley cross-section at 3 dams and 4 apron cross-sections
- ◆ Height monitoring at 10 exposed locations in the high mountains using GPS
- ◆ Annual precision levelling measurements (approx. 100 km) along roads and through pressure tunnels between the 3 dams
- ◆ Measuring stations with independent power supply using solar panels
- ◆ Permanent data communication via radio and GSM mobile communication

Technologies

- ◆ 1 main data and evaluation centre in the office
- ◆ 3 measuring centres on site, each with a control and temporary data storage
- ◆ Data communication between the various data centres via GSM mobile radio
- ◆ Sensors: 10 precision total stations, 10 GPS 2-frequency receivers, 10 multiple extensometers, 5 meteorological sensors