

# Track and excavation monitoring Murtenstrasse Bern

## Geomonitoring with geodetic and geotechnical sensors, supplemented with manual deformation measurements



- 📍 Bern, Switzerland
- 👤 Gross Generalunternehmung AG
- 🕒 2016 - 2019

### Services

- ◆ Planning, installation and operation of automatic measuring systems
- ◆ Monitoring of SBB tracks and masts at 20-minute intervals
- ◆ Monitoring of the excavation pit closures, buildings, groundwater levels and anchor forces at 1-hour intervals
- ◆ Automatic alarm via SMS and e-mail when the three-stage limit values are exceeded
- ◆ TEDAMOS Web, password-protected customer portal with 24/7 access

### Technologies

- ◆ 3 precision total stations with 250 monitoring and reference points
- ◆ 14 automatic piezometers to monitor groundwater levels
- ◆ 41 automatic measuring anchors for permanent monitoring of anchor forces
- ◆ TEDAMOS Web, password-protected customer portal with 24/7 access

The University of Bern has built a new building adjacent to the main railway line between Bern and Fribourg. For the new building, a construction pit was created with overlapping bored piles, reinforcements with anchors and a maximum excavation depth of 20 metres. Based on geological reports and experience with other construction projects in the vicinity, it was known that the ground was susceptible to subsidence, which is why extensive monitoring services had to be carried out during the construction of the excavation pit and until backfilling.

Two total stations were used to permanently monitor the four adjacent SBB railway tracks, one total station to monitor the bored piles at several levels and the adjacent road and buildings, 14 automatic piezometers to record the groundwater level and 41 automatic anchor load cells.

In addition, a local surveying company carried out extensive manual inclinometer, precision levelling and tachymeter measurements to obtain further geometric data on the excavation pit and adjacent roads and buildings. These results were also visualised on the web platform.