

Railway track and excavation pit monitoring Murtenstrasse Bern

GeoMonitoring by geodetic and geotechnical sensors complements manual deformation measurements



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

Expertise

TEDAMOS

Systems

- ◆ 3 high precision Totalstations Leica TM50/TCA2003 with 250 reference and observation prisms
- ◆ 14 automatic Piezometers to monitor the ground water level
- ◆ 41 automatic Anchor Load Cells
- ◆ Web-based, password-protected data portal for 24/7 access to all data and results

Find more information on the **TEDAMOS** solution under <http://en.tedamos.ch>

A new campus building for the University of Bern was constructed adjacent to the main railway line Bern-Fribourg. An excavation pit of up to 20 m depth, supported by bored piles and rock anchors was required for the foundation and basement. A geological assessment and previous experiences in the area indicated an elevated risk for terrain subsidence, thus mandating a comprehensive monitoring regime during the excavation and backfill work.

The monitoring system comprises two total stations for the permanent observation of the four adjacent railway tracks, one total station monitoring the bored piles at several height intervals and the nearby road and buildings, 14 automated piezometers for ground water level measurements and 41 automated anchor force measuring devices. Additionally, manual inclinometer, precision levelling and total station measurements are carried out periodically to collect further evidence of the geometry and stability of the excavation pit and its surroundings.

Services

- ◆ Planning, installation and operation of the automated measurement systems
- ◆ Monitoring of the railway tracks and catenary masts in 20 minute intervals
- ◆ Monitoring of the excavation pit walls, adjacent buildings, ground water level and anchor forces in 1 hour intervals
- ◆ Three-tiered automated alerting system by text messaging service and email for threshold exceedance
- ◆ Web-based, password-protected data portal for 24/7 access to all data and results