

Thermal leakage detection at the construction site of the Brenner Base Tunnel

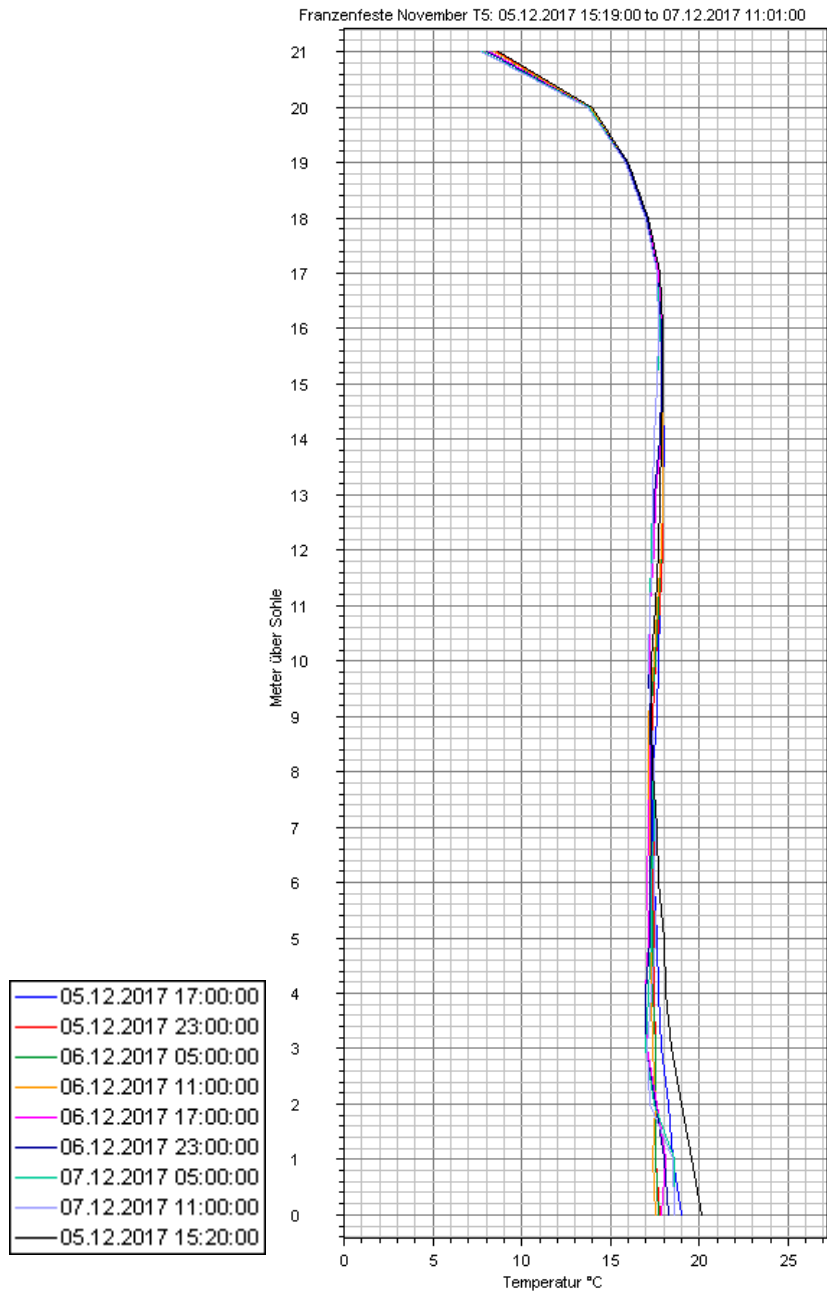
For construction works that take place below the groundwater table, dry excavation pits are essential. Therefore, it is usually necessary to separate the pit hydraulically from its surroundings. Thus, the excavation pit is artificially sealed. Using jet grouting, sealing elements are produced vertically and sometimes horizontally. Groundwater flowing into the excavation pit during dewatering is reflected in the change of the temperature profile in the vicinity of the affected area. The temperature measurements allow to locate leaks in the sealing system.



Temperature measuring chains at Brenner Base Tunnel

After finishing the grout columns, a pinpointing of possible leaks was carried out by temperature monitoring. For this purpose, 24 temperature probes were installed to a depth of 23 m. The temperature measurements started approximately three days before the drawdown test and ended a day later. In total, the temperature of the ground was measured for five days in ten minute intervals.

The following diagram shows the development of the ground temperature within the excavation pit during draw down. The depth of 0 m refers to the top of the jet grouted bottom slab. The temperature probe T5 shows no significant temperature changes caused by substantial leakages in the vicinity.



Temperature-Depth-Profile of the sounding T5