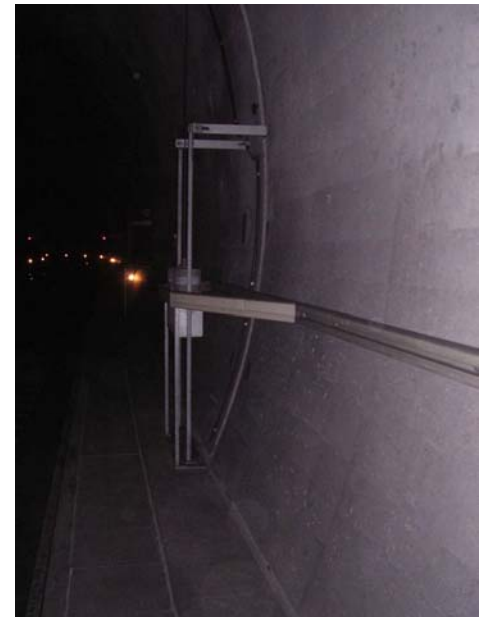


Zimmerberg Tunnel, Zurich, Switzerland

osmos

Integrated safety for structures



View of a section of the tunnel

Structural damage in a tunnel

Client

Swiss Federal Railways (SBB)

Structure

Zimmerberg Tunnel, Department of Zurich

Context

The tunnel is in the process of being constructed but a number of areas are showing cracks. The tunnel passes above a number of large buildings. See *Note on the SSF Monitoring reference sheets*

Client's requirements

The client wants to monitor how the cracks develop as well as the effects of railway traffic on the tunnel structure, in the future.

Instruments

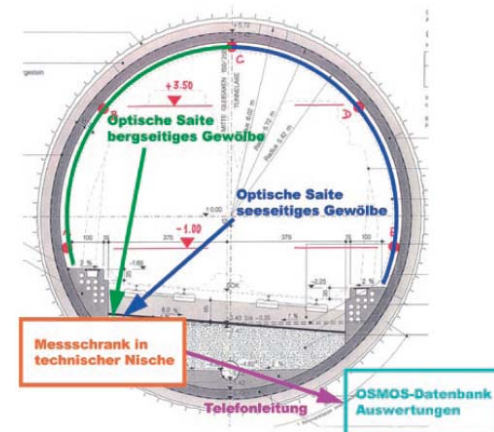
- OSMOS instruments were fitted in 3 different places:
- 3 monitoring stations
 - 8 Optical Strands in spiral steel hoses, 10 meters long
 - 50 X-Triggers linked to the monitoring station
 - 3 temperature probes

Initial results

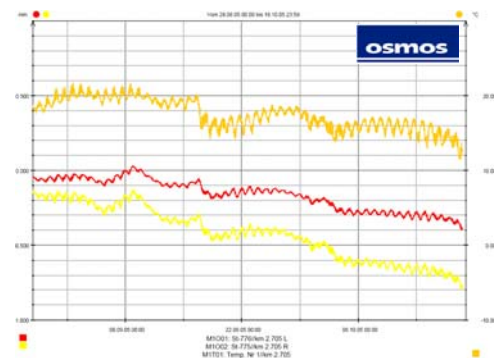
The results showed that the deformations on the areas fitted with OSMOS instruments were stable. Thermal variations appear to be the main cause of such deformations.

Advantages for the client

The client can monitor the deformations in his tunnel at all times. OSMOS long-range sensors are so high-quality that the customer does not have to install conventional sensors, which would have been more cumbersome (because a larger number would be required), more costly and less efficient, in terms of the information



Placing sensors on a section of the tunnel



Graphs showing static deformations and temperatures