

# REFERENCE CASE RAIL



## Comprehensive Support for Subway Construction in Nuremberg, Germany

To ensure the success of a project to extend its U3 subway line, the City of Nuremberg needed a reliable partner with a lot of experience in providing infrastructure construction consultancy. That is why they turned to TÜV Rheinland.

Basic facts	
Client	City of Nuremberg, Office for Subway Construction
Timeframe	March 2005 – ongoing
Project location	Nuremberg, Germany
Main services	<ul style="list-style-type: none"><li>▪ Subsurface investigations and foundations assessment</li><li>▪ Hydrogeological investigations</li><li>▪ Expert advice on tunneling methods (NATM), design including design calculations in difficult situations</li><li>▪ Expert advice on building pit support systems</li><li>▪ Evaluation of hydrogeological consequences of the project</li></ul>

### Initial situation and requirements

The City of Nuremberg decided in 2005 to extend the U3 subway line between the stations Maxfeld and Nordwestring. An extension was necessary in order to integrate a densely populated and developed area of the city into the subway network and so enable the people living there faster access to the city center. Since the new construction of this section required thorough planning and execution, an experienced partner was needed to ensure its building was safe and compliant with the applicable standards.

## Solutions, results

Thanks to the wealth of experience we have gained from our involvement in many infrastructure projects and our highly qualified experts in the field of subway construction, the City of Nuremberg chose TÜV Rheinland as its partner to cooperate on the project.

The main focus of our services for the project was subsurface investigations and the writing of expert assessments for the tunneling with NATM and open pit methods in a densely populated urban area. At later stages of construction our experts were also required to undertake hydrogeological investigations, such as pump trials and water pressure tests. Groundwater monitoring points were also installed to provide evidence of protection and the groundwater and standing water tested for contamination. During the actual execution of the construction work, it was also necessary to create a hydrogeological groundwater model and a plan for temporary lowering of the groundwater level. In order to guarantee safety prior to construction it was also necessary for our experts to perform numerous geotechnical evaluations, for example the statics of excavation shoring construction and rock subsidence protection.

In conclusion, we accompanied the building of the subway line during the entire construction phase and further supported the client by providing consultancy services and on-site geotechnical inspections.



### Benefits for the client

TÜV Rheinland supported the City of Nuremberg by providing:

- Expertise in extensive infrastructure services for major construction projects.
- Highly qualified and experienced experts to conduct the required services.
- Extensive support throughout the whole construction of the new section of the underground railway.

### Your contact:

TÜV Rheinland Group  
Industrial Services  
is@tuv.com  
www.tuv.com

### Did you know?

The new sections of the U3 subway line constructed are 2.4 kilometers in length and will later be served by an automatically operated system. This system is operated in mixed mode with conventional driver-operated trains being a world premiere at the time of its going into service.

### About TÜV Rheinland:

Founded 140 years ago, TÜV Rheinland is a global leader in independent inspection services, ensuring quality and safety for people, the environment, and technology in nearly all aspects of life.

We inspect technical equipment, products and services, oversee projects and help to shape processes for companies around the world. Since 2006 we have been a member of the United Nations Global Compact to promote sustainability and combat corruption.

Our experts offer you a comprehensive range of civil engineering services, all from a single source. Our complete range of services for civil engineering projects and maintenance includes extensive laboratory services, geotechnical consulting, statics calculations, advice on planning for construction, and the preparation of expert reports for damage.