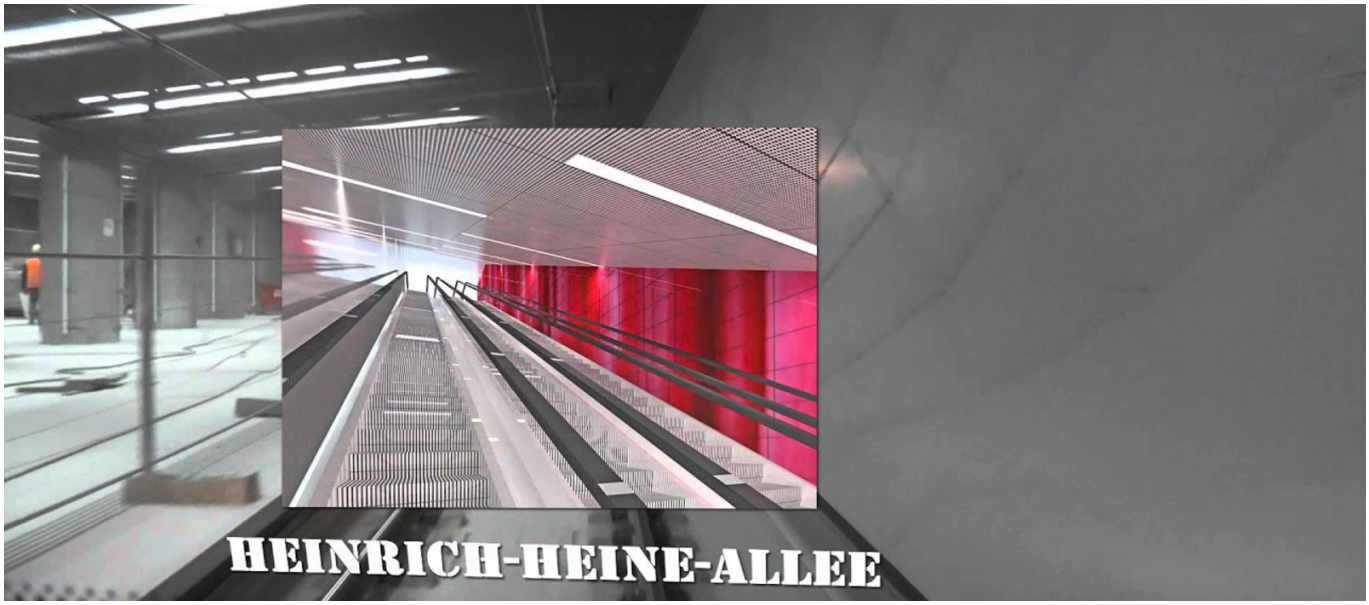
Implenia

Reference

Wehrhahn line, lot 1









SHORT DESCRIPTION

In order to improve the local public transportation system, the state capital of Duesseldorf has made the decision to expand the so-called core section of the Wehrhahn Line as an underground city railway line, replacing 5 aboveground streetcar lines. The new double-track tunnel section enhances the sustainable attractiveness of the local public transportation system and maintains the ability of improvements in urban development and miscellaneous traffic engineering in rail and track construction.

THE PROJECT

Wehrhahn-Linie is a challenging transport infrastructure project in inner-city Düsseldorf completed on schedule.

The new 3.4-kilometre-long suburban railway line, with a total of six stations and two overground stops, runs underground between the S-Bahn stations at Bilk and Wehrhahn. It mainly follows the course of the streets Elisabethstraße / Kasernenstraße and Schadowstraße / Am Wehrhahn.

Lot 1 includes creation of the tunnel structure via shield tunnelling, the construction of five train stations using the cut-and-cover method, and the construction of the access ramps and the two overground stops.

SERVICES IN DETAIL

- The tunnel in the loose rock is created mainly by means of hydro-shield tunnelling with reinforced concrete segments.
- The excavation pits for the train stations are constructed using diaphragm walls and anchoring. Extensive building protection measures involving high-pressure and compensation injections are required.
- The train station structures (extended building shell) are constructed using the cut-and-cover technique.

CHALLENGES

- The stations and the individual route sections are being constructed by means of shield tunnelling / cut-and-cover, or using open construction measures under the protection of excavation pit covers, in order to comply with the city's construction ordinances. This also entails extensive work on the existing roads, pipelines and ducts, which must be conducted in concert with the engineering work in terms of logistics and scheduling.
- In addition to this, an enclosure and cover have to be created for the excavation pit. All of this work must be carried out in several construction and traffic stages. The top priority here is minimising the impact on the environment and the surrounding area within the inner-city metropolitan zone.

FURTHER INFORMATION

The project was awarded the STUVA prize in 2015.

Implenia business units involved:

- Implenia Construction GmbH – west branch
- Implenia Tunnelling
- Implenia Foundation Engineering
- Implenia Technical Center – Machinery & Electrical and Materials Engineering
- Implenia Infrastructure – Technical Design Office

FACTS

Location	City of Düsseldorf , Germany
Status	completed
Construction volume (value of our services)	455 M EUR
Start of construction	December 2006
Completion	December 2015
Contracting entity	Landeshauptstadt Düsseldorf, Amt für Verkehrsmanagement
Project management	Implenia Construction GmbH, Niederlassung West
Planning	Implenia Construction GmbH – Technical Design Office (u.a.)
Concrete volume	110000 m^3
Reinforcement	25000 to
TBM Tunnelling	✓
Other tunnelling	✓

Overall length	3500 m
Tunnel length	2300 m
Cross-sectional area	70.7 m^2

SERVICES

- Tunnelling
- Transport tunnels
- Civil engineering
- Concrete construction
- Urban transport infrastructure
- Structural engineering



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