SABADELL METRO, EXTENSION

Sabadell Metro, Extension Metro Line 2, Barcelona, Spain

The extension of the FGC metro line 2 (FGC: Ferro-carrils de la Generalitat de Catalunya) in direction of Sabadell North has been implemented as underground structure with an overall length of more than 5km, including 320m long service tunnel, a 360m long rail yard and 5 metro stations.

Scope

The overall length of the extension of the FGC line is more than 5 km (underground). The single-track tunnels have an inner diameter of 6.0m. At the end of the extension section, there is a longer cut-and-cover section. The rail yard near the terminus station is excavated from an access tunnel by the cut-and-cover method.

Challenges

- Densely populated urban area
- Sensitivity for noise and pollution
- Settlement issues
- Site logistics

Amberg Services

- Optimization of final design
- Construction supervision for underground tunneling works
- Geotechnical and settlement monitoring
- Cost controlling

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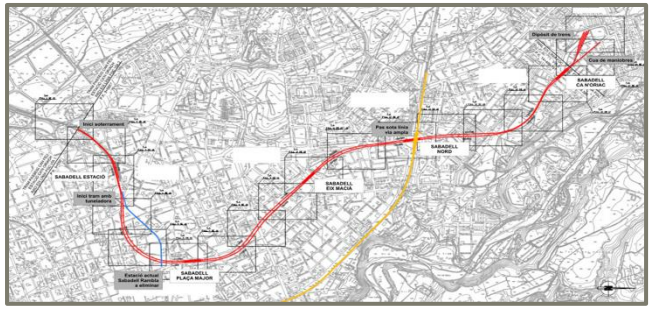
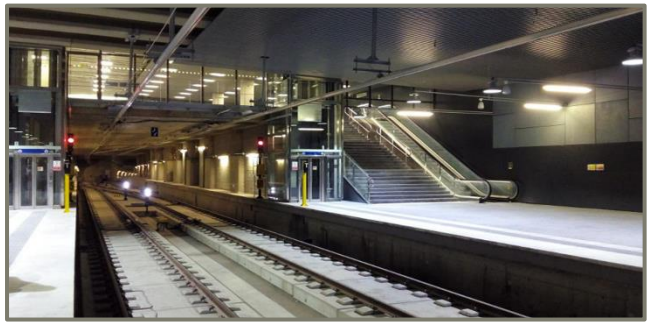


- Lay out of the extension of the FGC line to Sabadell

- Aerial photo of construction site



- Railway station (1 out of 5)

AMBERG FACTS

Contracted value Amberg

- Total CHF 1'840'444

Project Phases & Duration

- Planning, since 2008
- Construction works 2008 - 2011
- Commissioning 2012

Project Details

Tunnels

- 2 single-track tunnel tubes total length approx. 5.8km, converging into a twin track tunnel towards the terminus station
- Earth pressure shield TBM with diam. 6.74m (2 x 2'890m), min. radius of curvature 320m
- Single shell watertight segmental lining
- Cross passages every 250m
- Cut-and-cover sections (diaphragm walls), 560m length

Railway stations

- Total 5 stations
- 4 by cut & cover excavation
- 1 by drill & blast excavation at Plaça Espanya station

Other facilities

- Service tunnel, 320m length
- Rail yard

CLIENT FACTS

Overall costs

- Total € 218 Mio.

Overview Project

- New railway tunnel, length approx.5.8km
- 2 single-track tunnel tubes (with cross galleries every 250m), merging in one double-track tunnel tube at the end of the section
- Five stations

Geology

The geology is mainly composed of the following four ground formations:

- Gravely-sandy Quaternary (aquifer)
- Silty-clayey Quaternary (cohesive soils)
- Gravely sandy Miocene (aquifer)
- Silty-clayey Miocene (cohesive soils)

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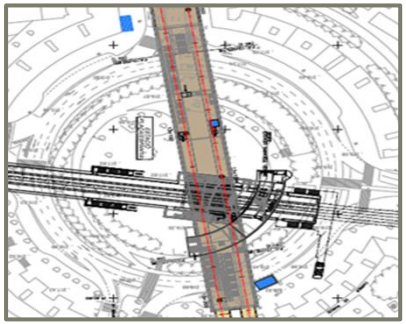
CHALLENGES



Plaça Espanya station

Sensitive urban area

- Densely populated city area
- Sensitivity for noise and pollution
- Sensitivity for ground movements
- Complex site logistics

ENGINEERING APPROACH

Construction works at Plaça Espanya station

Complex work phasing

- Interurban construction
- Complex arrangement for site logistics
- Extremely high safety requirements

TECHNICAL SOLUTIONS

Underground works at station area

Work schedule

- Working at different sites of the line simultaneously
- Tight schedule for completion of project
- Requirement for high standard of quality

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