SAO PAULO METRO, LINE 5 LILA – LOT 3

Sao Paulo Metro, Line 5 “Lila”, Lot 3, Sao Paulo, Brazil

Line 5 of the Sao Paulo Metro comprises a number of stations, ventilation shafts and twin single track tunnels, each approximately 5km long. Lot 3 runs from the starting shaft Conde De Itu to the finishing shaft at Bandeirantes.

Scope

The overall length of the line is over 5km. The single-track tunnel are excavated with an EPB machine, Earth Pressure Balance (EPB) TBM, having an inner diameter of 6.0m. The contract includes a total of five offline ventilation shafts and four stations along the alignment.

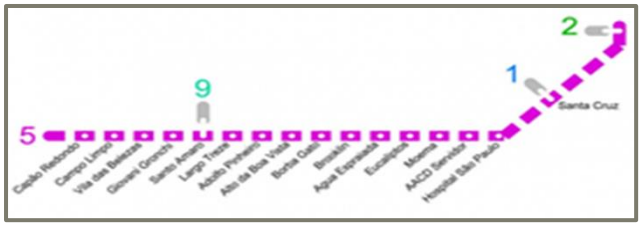
Challenges

- Densely populated urban area
- Restricted working area at starting shaft, difficult site logistics
- Environment sensitive for noise and pollution
- Difficult ground with settlement issues

Amberg Services

- Consulting services during TBM excavation
- Engineering services
- Geotechnical evaluation

AMBERG ENGINEERING



- Line 5 „Lila“ of Sao Paulo metro

- Construction Brooklin station

- Sao Paulo metro station

AMBERG FACTS

Contracted value Amberg

- Total € 125.000 (R$ 430.000)

Project phases & duration

- Planning, since 2010
- Construction works 2013 - 2015
- Commissioning 2015

Project Details

Tunnel

- 2 single-track tunnel tubes
  total length each approx. 5km
- Earth pressure shield (EPB) TBM with diam. 6.90m
- Single shell watertight segmental lining

Ventilation shafts

- 5 offline ventilation shafts along the alignment

Metro stations

- Total 4 metro stations
- 4 excavated by cut & cover method

CLIENT FACTS

Overall costs

- Total € 218 Mio.

Overview Project

- Metro tunnel, length approx. 5km
- 2 single-track tunnel tubes
- 5 Ventilation Shafts
- 4 Metro stations

Geology

The geology is mainly composed of the following ground formations:

- Alluvial clayey silt.
- Sao Paulo formation, sandy clay.
- Resende formation, silty to clayey

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CHALLENGES

Aerial photo of cramped construction site

Sensitive urban area

- Densely populated city area
- Complex site logistics
- Very restricted working area at shaft
- Sensitivity for noise and pollution
- Sensitivity for ground movements/settlements

ENGINEERING APPROACH

Assembly shaft for EPB-TBM

Complex work phasing

- Urban construction
- Restricted working area
- Complex arrangements for site logistics
- Extremely high safety requirements

TECHNICAL SOLUTIONS

Assembly works at starting shaft area

Work schedule

- Working simultaneously at different sites
- Tight schedule for project completion
- High standard of quality required

AMBERG ENGINEERING

AMBERG KEY PEOPLE INVOLVED

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