

# Tunneling and geotechnics

## Lisbon metro station Encarnacao

**Project type**  
metro station

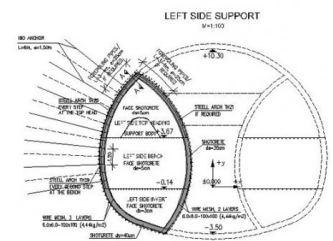
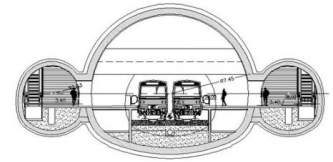
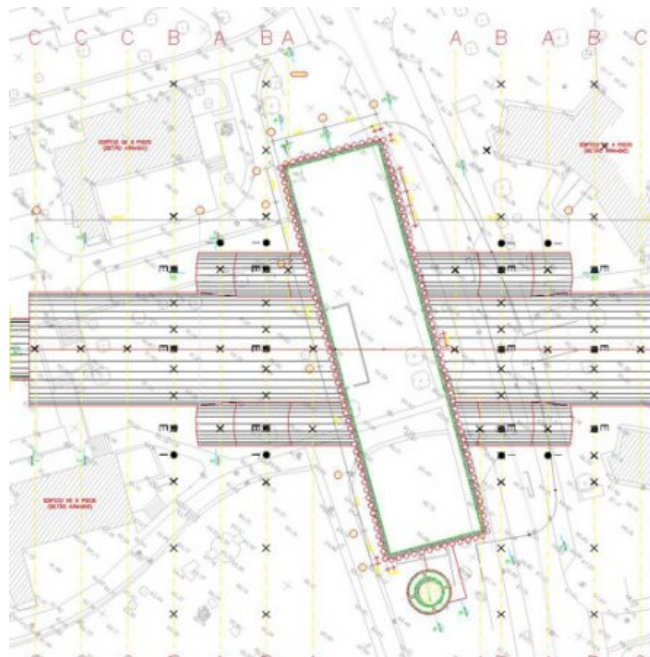
**Location**  
Lisbon, Portugal

**Investment value**  
40.000,00 €

**Year(s)**  
2006

**Services**  
tender design

**Investor**  
Metropolitano de Lisboa



The Lisbon metro company is extending the subway in the direction between the Oriente station and the Lumiar station, connecting the red and yellow line. Our task was preparation of the mining project. The challenge was to connect the escalator tubes which run parallel the main tube, virtually touching each other. The excavated span requires precise stability analysis. The open pit is based in inhabited area. Since that any displacements represent a great threat the buildings above the excavation and in the near surroundings. The tubes run from the open pit in two directions (toward present Oriente station and the other toward present Lumiar station).