

### BARCELONA METRO

BARCELONA - SPAIN

#### Monitoring building and ground movements throughout Barcelona for the construction of a 40km rail tunnel and stations for Route 9.

The city of Barcelona has decided to develop its metropolitan network by building a new line by 2010, providing services from the future TGV station, the city suburbs and the new Barcelona airport.

- Route 9**

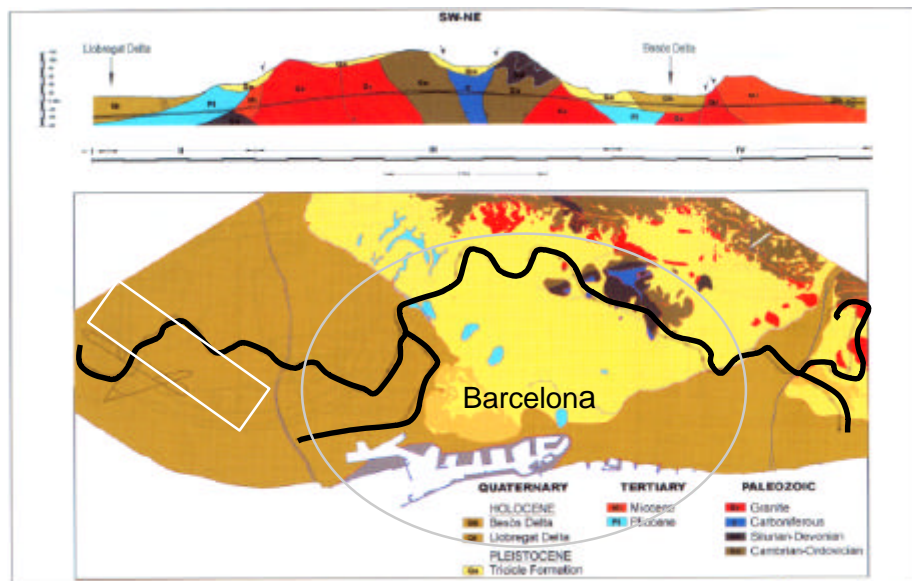
The new line is 41,400m long, and will have 43 stations. The innovative use of a single, 12 m-diameter tunnel was chosen. The metro will run on two levels. Each level will be dedicated to a specific direction of travel.

The layout of the tunnel, whose depth varies from between 15m and 60m, passes in the alluvial plains under the rivers Lobregat and Besos, and goes through many different geological interfaces

- The Route 9 monitoring contract**

The monitoring contract for the whole project has been awarded to the Joint venture of SOLDATA Iberia T5IIC.

The monitoring includes: the buildings and structures, the surface and geotechnical movements, the tunnel itself, and all of the access wells. It covers all geometric, topographic, geotechnical, hydrological, thermal and seismic aspects of the project, and includes the supply and installation of sensors and acquisition systems and the collation of the recorded information for the customer.



OWNER:	CATALAN REGIONAL GOVERNMENT
CONTRACTOR :	SOLDATA IBERIA T5IIC JV
CONSULTANT :	PAYMACOTAS
PROJECT DURATION:	AUGUST 2003 – AUGUST 2007

- SCOPE OF WORKS:**
- Real time monitoring of 18,000 buildings and structures
  - Follow-up of the 40 000 m-tunnel deformations
  - 600 CYCLOPS positions
  - 4320 instruments in real time
  - Manual levelling of more than 10,000 measured points
  - 17,000 linear m of boreholes, equipped with piezometers and inclinometers
  - Collation of all the recorded data on GEOSCOPE.