

TUNNEL UNDER THE STRAIT OF GIBRALTAR

The distance between the southernmost point of the Iberian peninsula is a mere 15 km. A project to unite the two continents was set up in the early 2000s. This is a geological-geotechnical evaluation report, in order to fill in information lacking for this project to unite Europe and Africa through the straits of Gibraltar, taking into account the special conditions of a closed –in sea between the two continents with remarkable depths and very strong currents to and from the Atlantic ocean.

The preliminary project considered the realization of two tunnels (West in phase 1 and East in phase 2) with an intermediate gallery for services.

The outline of the submarine tunnel is inscribed in the Camarinal submarine gorge with constitutes residual relief formed by tectonic scales of flysch which formed the Gibraltar junction before the opening of the straits 5 million years ago at the end of the Miocene period.

Laboratory tests are carried out on samples recovered in boreholes and in shafts excavated in Tarifa (Spain) and Malabate (Morocco) to determine the geomechanical parameters attributed to the different lithological types to model the convergence phenomenon in the area of clayey breccia.

These convergence parameters allow an analysis of the advancing speed of the TBM implied in the tunnel excavation and the pressure on the shields.

The tectonic activity in the area is analysed with the last studies of Gutcher presented at the Lisbon Conference to commemorate the 250 anniversary of 1755 earthquake.

And finally an alternative solution, which had previously been rejected, is presented taking into account the very recent discoveries of new composite materials and new techniques for deep foundations on the sea bed.