

# Portugal



**Name:** Comissão Portuguesa de Túneis e do Espaço Subterrâneo (CPT) – Portuguese Tunneling Association And Underground Space.

**Type of Structure:** NA Committee of Portuguese Geotechnical Society (SPG), non-profit association.

**Number of Members:** 70 individual members, 8 corporate members.

**The board of the CPT** is made up of President Raúl Sarra Pistone, Vice-Presidents: Nadir Plasência and Isabel Fernandes, General Secretary Luis Miranda, Assistant Secretary João Gouveia and Treasury Gonçalo Diniz Vieira.

## ASSOCIATION ACTIVITIES DURING 2022 AND TO DATE

### Active Working Groups:

**GT1:** Catalogue of underground works constructed in Portugal

- Registration of the underground works in Portugal and also constructed by Portuguese companies in other countries.
- Publication of the book "Tunnelling in Portugal"

**GT2:** Underground works Contractual Practices in Portugal

- Mirror of ITA WG3.
- Analytical work on the practice and contractual forms of public procurement in underground works
- Development of contributions to the revision of the Public Contracts Code.

**GT3:** Health and Safety in UW

- Mirror of ITA WG5.
- The GT3 published the document "Technical Guide on Safety and Health in the Design and Construction of Underground Works" aiming at the legislative framework on safety and health in underground works.

**GT4:** BIM and Information Management in UW

- Mirror of ITA WG22 and integrating the EUTFBIM group.
- Promote knowledge and application of the BIM methodology among the national technical community involved in the Design, Construction and Operation of tunnels and underground works with a high geotechnical component.
- Recently the GT4 organized a successful BIM event in Lisbon, together with the counterpart working group from the Geotechnics of the Transport Commission.

**GT5:** Life Cycle Asset Management

- Mirror of WG2 and WG21 of ITA.
- Identification of the different methodologies used in the inspection and monitoring of different tunnels.
- Taking into account the different types of underground spaces, trying to find common lines of methodologies used in the inspection, monitoring and maintenance of these structures.
- Participation in the EUTF group on "Predictive maintenance and refurbishment".

**GT6:** Construction Methodologies

- Mirror of WG19, WG14 and WG23 of ITA.
- Construction method applied in the national market of underground works.
- Practical solutions regarding the selection of construction equipment.
- Technical solutions for shaft construction.

**GT7:** Sustainable Design

- In correspondence with the ITA steering committee on sustainability.

## CURRENT TUNNELLING ACTIVITIES

Currently there are five urban underground projects in progress, located in the cities of Lisbon and Porto. These projects are:

- Two projects integrated into the Expansion Plan of the Lisbon Metropolitan Network for the extension of the Yellow and Green Lines – Rato/Cais do Sodré (Fig 1)
- Two projects integrated in the Expansion Plan of the Porto Metro network (Fig 2)
- The General Drainage Plan of Lisbon (PGDL), for the Lisbon Municipality (Fig 3)

### A) Lisbon Metro network extension of the Yellow and Green lines – Rato/Cais do Sodré

The Expansion plan of the Lisbon Metro network for the extension of the Yellow and Green lines develops the area between Rato Station and Cais do Sodré Station. It is divided into two lots, the first between Rato Station and the beginning of Santos Station, including the construction of two ventilation shafts (PV208 and PV213) and Estrela station. The second begins at Santos Station (including its construction) and ends at Cais do Sodré Station. The tunnels are built using NATM and will have a length of around 2km.

The total investment is about €150M for the underground works.

### B) Porto Metro network Expansion Plan Construction of the Circular Line (Pink Line),



Fig. 1 – Expansion Plan for the Lisbon Metro network.



Fig. 2 – Porto Metro network expansion plan.

### **Aliados/Praça da Liberdade – Casa da Música/Boavista**

The Circular Line (Pink Line) runs between Casa da Música/Boavista Station and Aliados Station/Praça da Liberdade, over a 3.2km length and includes the construction of four underground stations (Liberdade/S. Bento, Hospital St. António, Galiza and Boavista/Casa da Música), three ventilation shafts (PEV1, PEV2 and PEV3) and the diversion of the Vila River. The contract was awarded for €189M in November 2020.

### **Construction of the Extension of the Yellow Line (Santo Ovídio - Vila D'Este)**

Construction of the extension of the Yellow Line between Santo Ovídio and Vila D'Este stations includes a 3.2km extension of double track, underground and surface development, three new stations – Manuel Leão/Hospital Santos Silva and Vila D'Este, a Ventilation and Emergency Well (PVE) and a Material and Maintenance Park next to the terminus in Vila D'Este.

### **C) PGDL – General Drainage Plan of Lisbon, by the Municipality of Lisbon**

The PGDL – Lisbon General Drainage Plan includes the construction of two tunnels



Fig. 3 – Lisbon General Drainage Plan.

with an i.d. of 5.5m. The first will be the Monsanto-Santa Apolónia tunnel (TMSA) and the second the Chelas-Beato tunnel (TCB). The Monsanto-Santa Apolónia tunnel is about 5km long and the Chelas-

Beato tunnel is about 1km long. The excavation of these tunnels will be carried out by a by 6.4m diameter CREG-WIRTH EPBM. The total investment is about €132.9M.