

Brazil

BRAZILIAN
TUNNELLING
COMMITTEE

CBT
COMITÉ
BRASILEIRO
DE TÚNEIS



Name: Brazilian Tunnelling Committee (CBT)

Type of Structure: CBT is a committee of the Brazilian Society for Soil Mechanics and Geotechnical Engineering (ABMS). It is an open society based on membership

Number of Members: 218 Individual Affiliate Members and 18 Corporate Affiliate Members.

ASSOCIATION ACTIVITIES DURING 2022 AND TO DATE

January

18th – Beginning of discussions for the creation of a Technical Standard of Tunnel Inspection for the Brazilian Technical Standards Association

February

17th – Webinar CBT – “Geotechnologies applied to underground infrastructure works” – Vinicius Figueiredo
25th - Online tunnellers chat

March

17th – Lecture for undergraduate students in Engineering at UFRGS and La Salle universities in Porto Alegre. “Tunnels for a better life” – Eloi Palma Filho.
24th – Webinar CBT – “Tunnel portal construction in humid tropical highlands” – Álvaro Rodrigues
25th - Online tunnelers chat

April

6th – Book release event – “Shotcrete Manual” – Paulo Fernando Araújo; with the special chapter: “Shotcrete in

tunnels”

28th – Webinar CBT – “Use of drilling fluids in shields” - Leonardo Silveira

May

17th – Lecture organized by the Engineering Institute – “Tunnels in urban areas” – Tarcísio Barreto Celestino
26th – Webinar CBT – “South Coast Tunnels - Florianópolis Bypass” - Thiago de Sa Lima
28th – Lecture for the Portuguese Tunnelling Association (CPT), as part of a tunnel workshop, entitled “When to use a TBM - Types of machines and selecting the most suitable one” – Daniela Garroux G. de Oliveira

July

29th – Webinar CBT – “Technologies for safe tunnelling and underground mining operations” - Marcelo Fernandes, Renato Almeida & Marcus Benassi

August

25th – Webinar CBT – “Challenges experienced in tunnel boring machine construction - projects in Australia” – Viviana Braga



September

29th – Webinar CBT – “Solutions for TBM technologies” - Rolando Justa

October

13th – Webinar CBT – “Madrid Metro and its use of the Belgian Method” – Cláudio Dias
26th – Lecture in the Argentinian Tunnelling Association (AATES, Asociación Argentina de Túneles y Espacios Subterráneos), in the event 12ª Jornadas de Túneles y Espacios Subterráneos – Hugo Rocha.

November

10th – Webinar CBT – “Upcoming projects in Prague: route selection for a railway tunnel and new metro line” - Zdenek Zizka
27th – Webinar CBT – WTC 2022 Echoes – Several presenters talking about their publications and experience during the ITA-AITES WTC 2022

December

2nd – Tunnel Day Hybrid Event – Theme: “Production Challenges in Large Tunnel Excavation”; total of 120 live attendance, plus over 900 online

14th – Webinar in partnership with CBMR – Brazilian Rock Mechanics Committee – “Degradation of rock strength in tunnels” – Werner Bilfinger, 2022 ISRM Franklin Lecture award winner

15th – Webinar CBT Young Members – “Figueiredo Ferraz 2022 Award Winners” – Luiz Henrique Zago, Mariana Campos, Tom Fausel Koch

Publications

Shotcrete Manual - Paulo Fernando Araújo; with the special chapter: “Shotcrete in tunnels”

Journal: Soils & Rocks (www.soilsandrocks.com.br), in English, published by the Brazilian Society for Soil Mechanics and Geotechnical Engineering (ABMS), the Brazilian Association for Engineering Geology and the Environment (ABGE) and the Portuguese Geotechnical Society (SPG). Three issues are released per year.

Press and social media

Articles on the CBT website; mailing at CBT@News; and posts on Facebook, Instagram and LinkedIn.

CURRENT TUNNELLING ACTIVITIES

During 2022, there were several tunnels under construction, some completed in 2022 and some major projects still ongoing. One completed is the “Rodovia dos Tamoios - SP-099”. The project was one of the ITA Awards finalists in the major works category (over €500M). With several constructive challenges, the project also focused on minimizing its environmental impact with its five main road tunnels totalling a length of 13.2km.

In 2022, two major metro projects began full speed excavation under one of the biggest cities in the world, São Paulo. Lines 2 and 6 are ongoing, with several stations and tunnels, using both conventional and mechanized methods.

Another road tunnel project at full speed if the Florianópolis Bypass, with four tunnels. This is the city to host one the CBT activities at the beginning of 2023 - the Road Tunnels Seminar.

Regarding tunnels for hydroelectric power plants, there were a total of 3,255m of excavated tunnels in the south of Brazil.

Finally, for utility projects, a total of 8.4km of tunnels were excavated using pipe jacking.

FUTURE TUNNELLING ACTIVITIES

For 2023, São Paulo’s metro projects will continue, with the TBM on Line 6 excavating from 2022 and the TBM on Line



2 starting in the middle of the year. Several conventional tunnels for both metro projects are currently being excavated and other connecting tunnels for both projects should start in 2023. Additionally, the extension to Line 2 should probably start by the end of 2023, connecting São Paulo to its neighbouring city, Guarulhos.

For São Paulo Metro, several viability and preliminary projects will start during

2023, such as Lines 16-Violet, 19-Sky Blue, 20-Pink and 22-Brown. Regarding road tunnels, the north connection tunnel project, as part of the São Paulo city ring, Rodoanel North, could resume soon.

In the South, the Florianópolis Bypass should be completed by late 2023.

Finally, the new government is promising to release a railway link, which could include tunnels.

STATISTICS

1. Length or volume excavated - % mechanized / % conventional during 2022

Total of 31.16km of tunnels, 30% TBM and 70% NATM

2. List of tunnels completed

- 5 tunnels of the Tamoios Road
- 3.25km of hydroelectric power plant tunnels
- One NATM connection tunnel completed on Line 2 – São Paulo Metro

3. List of tunnels under construction

- Line 2 Green Line – São Paulo
- Line 6 Orange Line – São Paulo
- Florianópolis Bypass

EDUCATION ON TUNNELLING IN THE COUNTRY

Brazil has several universities providing education in tunnelling, including graduate and postgraduate courses, as well as research groups. Some to be mentioned are:

- UnB – Brasilia University – Tunnel graduate course (60h course) and post graduate course (30h course), as well as a research group
- EPUSP - Polytechnic School of the University of São Paulo – Graduate course that includes tunnel execution (NATM and TBM) and post graduate course, focused on NATM excavation
- EESC – São Carlos Engineering School – part of the ITACET University Network, includes post graduate courses for a master, PhD and Post-Doc programs
- Presbiteriana Mackenzie University – a graduate course entitled “Tunnels and underground structures”