

# Argentina



**Name:** Asociación Argentina de Túneles y Espacios Subterráneos (AATES)

**Type of Structure:** non profit, open association

**Number of Members:** 44 affiliate members, 8 corporate members

## ASSOCIATION ACTIVITIES DURING 2020 AND TO DATE

October 27th - 28th saw the local Tunnelling Congress "Digital Tunnel – Digital Technology applied to Tunnels" held, with the participation of experts from various Latin America countries and three expert representatives from the ITACET Foundation, developing a training lecture on the same theme as the Conference.

Additionally, one online training course was developed for the Argentine Construction Chamber, dealing with "Fibre Technologies for Concrete Reinforcement".

## CURRENT TUNNELLING ACTIVITIES Tunnelling under the Sarmiento Railway Line – Buenos Aires

Replacement of the Sarmiento Railway Line running from Western Head Station in Buenos Aires (Station Once) to Station Castelar via approx. 22km of double track tunnel, mainly excavated using a 12m diameter EPBM, plus a short NATM section. Nine stations feature along this section, seven mined and two in cut & cover. Mid 2019 saw the first approx. 7km long running tunnel section excavated using the EPBM with the machine recovered in an open pit for maintenance. As stated in the previous reports, works have been interrupted due to a lack of financing. It is expected that the National Government will take a decision in early 2022 on whether to continue with the remaining approx. 4km of mined tunnel or not.

## Sewer on the left margin of the Riachuelo River and Emissary – Buenos Aires

This project comprises the construction of a main sewer located parallel to the Riachuelo River in two sections: a first approx. 9.4km long, 3.2m i.d. upper section excavated by EPBM, and a lower section of approx. 5.1km length and 4.5m i.d., excavated using a slurry machine. Additionally, the project features a Treatment Plant and an Emissary of approx. 12km length with 4.3m i.d. to be excavated into the La Plata River using an EPBM. Three contracts were awarded in

2015 (sewers, plant, emissary), which are all presently in construction. At the end of 2018 the construction of the treatment plant was interrupted but restarted at the end of 2019, after the project was awarded to a new contractor. At the end of 2019 the excavation of the emissary tunnel was concluded successfully. The EPBM excavated the 9.4km, whereas the slurry machine also finished the lower 5.1km long section. Secondary pipe jacking galleries of 800mm diameter and 1,100mm are also finished, with a total excavated length of 14km. Connections to the existing network are currently being built.

## Underground water main "Río Subterráneo Sur" – Buenos Aires

This project was designed to provide a new potable water distribution main fed by the Grl. Belgrano water purification system in Bernal, in the southern area of the Great Buenos Aires neighborhoods, feeding a population of 2.5M people. It consists of a 23km long underground water system with two large pumping plants, tendered for construction by the water company AYSA in two contracts. A contractor has been selected for the first section (Lot 1) of 13.5km, 3.9m i.d. tunnel and the pumping plant No.1. The project has two EPBMs of 4.66m diameter, erecting a universal segment ring 6+0, 1.4m wide, and 0.25m thick. The first TBM is currently in operation, launching from the four-lobed shaft located in the General Belgrano plant, and having excavated 4,360m to date, or some 55% of its length, and 32% of the total lot. The second TBM will launch from an intermediate quad-lobed shaft, currently under construction, with the start of construction of this second section of tunnel forecast for November 2022, to complete the tunnel to pumping plant No. 1 in Lomas de Zamora. The first contract is scheduled to be complete in August 2024. The second part of the project, (Lot 2) is still not awarded, but has been tendered.

## Two road tunnels on National Highway 75 – Province of La Rioja

The project's objective is to bypass a road section aligned along a creek, featuring

beautiful gardens and expensive weekend houses, by constructing two bidirectional road tunnels of 560m and 890m length using conventional methods with a shotcrete lining and a prefabricated inner lining. The excavation of the shorter tunnel was completed at the end of 2020. The excavation of the second (longer) tunnel started in early 2021 and is scheduled to be finished by the end of 2022. Finishing works and electromechanical and safety equipment fitting out of the first tunnel is in progress.

## Several sewer projects in Buenos Aires In recent years, Buenos Aires has

constructed a large quantity of sewer projects for the AYSA Water Company and Buenos Aires Government with some new ones in progress via the pipe jacking method. Typical diameters used range between 0.8 and 2.4m, with jacking sections in the range of 200 – 300m.

## FUTURE TUNNELLING ACTIVITIES Red de Expresos Regionales (RER)

In 2016, the national government presented this very challenging project featuring the underground connection of Buenos Aires' three main railway stations: West Station "Once", South Station "Constitución" and North Station "Retiro".

The project comprises 20km of new railway lines, approx. 85% in tunnel, with the rest on viaducts. Besides the underground enlargement of the existing stations, four new underground stations will be constructed using the NATM method with an approx. 280m<sup>2</sup> cross section. During 2018 and 2019 all three viaducts were completed. All underground works, however, were not initiated, due to financing restrictions. During 2019 the Transport Ministry modified the underground works, optimizing and downsizing them to make them more economical, but also scalable for construction. Since then, no action regarding the implementation of this project has been taken, due to a lack of financing, a situation which is expected to last for at least the coming two years (2022 and 2023).

## Bi-National Trans Andean Tunnels – Argentina - Chile

Agua Negra Tunnel: This 14km long, twin-tube road tunnel is a project of priority for both countries. After a pre-qualification process for contractors was launched in 2017, with a short list of

companies published in 2018, no further action for the tender of the construction was implemented. This was mainly due to Chile's reluctance to develop the project. In fact, at the end of 2021 the Chilean Ministry of Public Works launched a new study of alternative corridors, which aim is to identify road tunnel options with a lower length, overburden, and overall cost, compared to the project so far developed by the Argentine Authorities. This new Chilean initiative was not discussed within the Bi-National Entity "EBITAN", and hence not supported by Argentina. It is expected that a bidder will be selected in 2022.

**Las Leñas Tunnel:** This approx. 11km long twin-tube road tunnel is officially recognized by both countries as the other priority bi-national base tunnel. At the end of 2019 a new feasibility study with the incorporation of detailed geological-engineering investigations was awarded by the Chilean Public Works Ministry to a consulting JV. Its aim is to develop a further design step in terms of tunnel alignment and functionality, upgrading at the same time the geological-geotechnical model,

allowing a more accurate cost estimate of the project. The study was completed at the end of 2021 and will be the basis for the next design step, scheduled to be a tender design.

**Tunnel Cristo Redentor – second tube (widening of Tunnel Caracoles):** With the support of the IDB in 2019, the design of the second tube of the existing 3.1km long Cristo Redentor road tunnel was completed and the tender for construction developed. This second tube will be constructed as an enlargement of the existing single track Caracoles railway tunnel, which was part of the Transandean Railway from Buenos Aires to Valparaiso but has been out of operation since 1978. The tenders from the contractor JV's were delivered in 2019 for the construction of the Argentine part of the tunnel, with contract award to the winning contractor JV at the end of 2021. Since then, this JV has initiated all preparatory works to start construction in 2022. This tender will only cover the Argentine part of the tunnel, up to the Chilean border. The Chilean part of this tunnel has still not been tendered.

### **Metro Buenos Aires and other underground projects in Buenos Aires**

During 2021 the tender design for construction of the Colector Baja Costanera, a sewer tunnel along the coast of the La Plata River, was developed. Again, due to financing reasons, the process of tendering for construction has still to be launched. Similarly, the third and last rainwater relief tunnel for Buenos Aires, called the Medrano River, which was scheduled for a construction start in 2020, is still on hold.

### **EDUCATION ON TUNNELLING IN THE COUNTRY**

Postgraduate Course of Design and Construction of Tunnels and Underground Works at the Engineering Faculty of the University of Buenos Aires, held for the second year in 2019, with a duration of 32 hours. Both lecturers, the engineers Ezequiel Zielonka and Jorge Laiun, are members of AATES.