Colombia

Name: Comité Colombiano de Túneles (Colombian Tunneling Committee)

Type of structure: Non-profit Organization ("Asociación Sin Ánimo de Lucro" in Colombia)

Number of Members: Nine (9) corporate members, representing more than 2000 engineers

Website: www.cct.org.co

MAIN ACTIVITIES

The Colombian Tunneling Committee has been admitted as a adjunt society of the Colombian Society of Engineers.

Members of the Colombian Tunneling Committee participated in the WTC 2016 in San Francisco, as members of working group number 2 (Research) and number 3 (Contractual Practices).

CCT was actively involved in activities within working group 3 – Contractual Practices and attended WTC 2016. Moreover, some members make up part of a joint task Group (TG 10) currently undertaking an evaluation of FIDIC forms of contracts in order to produce a FIDIC Standard Form of Contract for Underground Construction Projects.

CCT was actively involved in activities within working group 2 – Research, specifically for site investigations, and some members attended WTC 2016 with presentations of technical papers.

WGs

The Colombian Tunneling Committee has the following local working groups:

WG
WG 3 Contractual Practices
WG 5 Health and Safety in Works
WG 6 Maintenance and repair
WG 12 Sprayed concrete use
WG 15 Underground and environment
WG 19 Conventional Tunneling

Training:

The Committee organized a graduate course on tunnels in rock and soil, taught at the Escuela Colombiana de Ingenieros (Colombian University of Engineering), including topics on design, construction, contractual aspects and risks. Among the lecturers were several experts who were invited to participate, including Tarcisio Celestino, to lecture on soft soil tunnels and shafts.

Technical documents:

- Preparation of a technical bulletin on In-Situ Stress Measurements for WG-2.
- Preparation of an article on Design of Segmental Tunnel Linings for WG-2.
- Work on FIDIC-ITA WG 3 joint task group on a new standard form of contracts for underground construction projects.

- The National Highway Institute of Colombia (INVIAS) is preparing a Guide for Design and Construction of Tunnels, along with the Colombian Society of Engineers (SCI). The CCT sent comments on the project to the SCI and participated in workshops with the INVIAS and the National Ministry of Transportation on this matter.

TUNNELS – UNDERGROUND WORKS

Main works for the year 2015-2016 in Colombia

Colombia is currently undergoing a massive program for the project organization, design and construction of a series of last generation highways (called fourth generation highways) which are intended to enhance the country's economy by reducing travel and transportation costs. These projects, which are going to be built within the next 10 years, include more than 125km of tunnels (out of which approximately 96km are more than 2km long).

A tunnel worth mentioning is the Toyo Tunnel, which will be located in the State of Antioquia and began construction in June 2016. The

El Toyo Tunnel. Taken from Antioquia State Government

highway project features a 9.7km long tunnel (the longest and most expensive highway tunnel in Colombia) and 4.37km of shorter tunnels.

The pilot tunnel for the Tunnel of La Linea, an 8.6km long milestone tunnel in Colombia, was completed in 2008. The completion of the main tunnel and 9 shorter tunnels is underway. The tunnel's expected completion and opening is expected to take place in 2018.

Under construction also are 22 tunnels on the road between Buga and Buenaventura (with 8.8km of total length) and 19 tunnels on the road between Bogotá and Villavicencio.

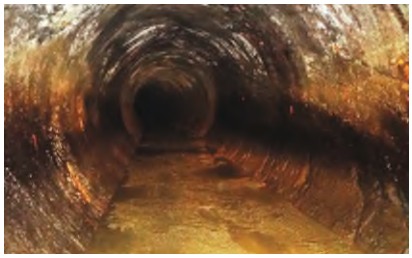
La Línea Tunnel. Taken from National Highway Institute (INVIAS) - (http://www.reporterosasociados.com.co)

Also, most of the fourth-generation highways involving tunnels are currently under tender for the final design and construction; and work should be beginning in the next couple of years.

The electricity industry has been working on the development of a series of projects which require underground works to be located on the geologically complex Andes mountain range.

Ituango Hydroelectric Project - Underground cavern. Taken from (https://medellin.gov.co/)

At present the Ituango Hydroelectric Project is being built, featuring approximately 10km of tunnels, two massive underground caverns and 2400MW of installed capacity.



Rehabilitation of the 14km long tunnel of the Tunjita Hydroelectric Project.

Small hydropower stations are also under development (ranging from 20MW to 60MW installed power), including large tunnels and underground caverns. Approximately 10km of tunnels for hydropower stations are currently under construction. Moreover, 3 deep underground caverns are under construction.

Túnel de Oriente. Taken from (http://antioquia.gov.co//)

The works for the Túnel de Oriente Project in the State of Antioquia are also underway. The project comprises 2 tunnels (3.68 and 3.59km long) being excavated by D&B. The total length of the tunnels in the project is 8.2km.

Finally, a series of sewer system projects are currently being developed, which use the latest trenchless technology systems and specifically micro-tunneling (Pipe jacking). The Centro Parrilla and Hato La Señorita projects in Medellín (currently under construction) comprise the rehabilitation of existing sewer network and the construction of new mains with a total length of 34.5km, out of which 22.6km are undertaken through pipe jacking.

2017 ACTIVITIES PLANNED

The Committee will organize the 3rd edition of the graduate course on tunnels in rock and soil, taught at the Escuela Colombiana de Ingenieros (Colombian University of Engineering).

Moreover, the Committee is aiming to organize a workshop and a seminar on underground works design and construction with the different working groups.