

PRESS RELEASE

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For Immediate Release

WORLD TUNNEL CONGRESS 2018 IN DUBAI: THE MIDDLE EAST CONSOLIDATED ITS POSITION AS POWERFUL EMERGENT MARKET

Held in Dubai, from 21st to 26th April by the Society of Engineers (SOE) and the International Tunnelling and Underground Space Association (ITA), the World Tunnel Congress and 44th ITA General Assembly were a momentous occasion and an undoubted success for the global industry.

Focused on *"The Role of Underground Space for future cities"*, the world tunnel congress shared a light on the sustainable aspects of developing underground construction. The challenge faced today by many key players of the industry (Engineers, urban planners, architects), when building new underground facilities is to fully respect the surrounding nature.

GLOBAL TUNNELLING ACTIVITY

- Global output (2016) : 86€bn
- The yearly average km of constructed tunnels : 5200 km
- The growth of around 7% growth per year is twice as big as the global construction growth

The opening ceremony was well attended by VIP guests, delegates from government and private sectors, presidents of international engineering associations, representatives from major engineering and tunnelling companies, as well as key stakeholders in tunnelling industry from all over the world.



Inaugurated by **Eng. Dawoud Al Hajri**, Director-General of Dubai Municipality and President of the Society of Engineers and **Prof. Tarcisio Celestino**, ITA President, the ceremony was rythmed by high-skilled lectures and speeches, notably the **Muir Wood Lecture** given by Edward Cording and **the Landmark Lecture** on roman underground road network in Naples given by Stefano de Caro. **Eng. Suleiman Abdelrahman Alhajri** also gave a lecture on major works

on-going in the UAE.

"The United Arab of Emirates has always been a pioneer of development in the region, especially in the field of tunnels and the use of underground space, with a number of ongoing mega-projects. We are honoured to be the first country in the Middle East to host the World Tunnel Congress. We welcome all the academics and the specialists in the field, who will be sharing their knowledge to upgrade the engineering sector in the UAE, and the tunnel sector in particular."

Eng. Dawoud Al Hajri, Director-General of Dubai Municipality and President of the Society of Engineers



From this point flowed presentations, working groups, seminars. With 125 technical papers presented orally and 60 posters, the World Tunnel Congress has once again consolidated its position as the world's premier tunnelling event.

During the 44th ITA General Assembly, Copenhagen was chosen to host the World Tunnel Congress in 2021. Next year it will be in Naples, Italy and in 2020 in Kuala Lumpur, Malaysia.

AN INTERNATIONAL EVENT DEDICATED TO SUSTAINABLE CONSTRUCTIONS & HIGH-SKILLED EXPERTISE:

- NEW APPROACHES OF UNDERGROUND SPACES AND SUSTAINABLE DEVELOPMENT

There is a common trend that consists in saying underground space must be developed in urban areas facing space scarcity. Although, new global demand, urban agenda and sustainable goals require to look differently at underground spaces and their utilization. For this edition of the WTC, the link between sustainable goals and underground space is more than ever at the core of many discussions.

The ITACUS technical session highlighted various innovative concepts including those presented by the *Young Professionals Think Deep Programme*, such as a virtual reality model of hard rock wastewater tunnel used in Stockholm. Also, the **digital twin tunnel** presented by **Karin Dehaas** showcased the potential benefits of a fully digital tunnel, allowing to identify with precision the surrounding environment and to share data to predict aging behavior, malfunction or failure, in order to preserve the existing nature around underground constructions.



For this edition, **Han Admiraal** and **Antonia Cornaro**, co-chairs of **ITACUS Committee** presented their new book "**Underground Unveiled: Planning and creating the cities of the future**". The book explores a new way of thinking underground spaces, integrating visions of all stakeholders: urban planners, urban designers, architects, geologists, engineers... The authors give a global overview of innovative concepts on-going all around the world supporting

the idea of underground space as a lever of sustainable development: underground farms, multi-functional tunnels, underground pedestrian lines...

More information : <https://thinkdeep.net/>

The ITACUS Committee:

The committee has been setup to address the issue of Underground Space Use worldwide and to raise awareness with regards to both the actual use and the need to develop a vision on the use which allows for planning the use of underground space.

- **CONTRACTUAL PRACTICES IN 21st CENTURY: THE ITA AND FIDIC WORK HAND IN HAND TOWARDS A STANDARD CONTRACT**

Underground construction is a fast growing market sector and a special one by many aspects. The underground works differ from high-rise construction because the creation of the necessary space within the ground and the nature of the latter is often unpredictable without doubt. It involves greater uncertainty and greater risk.

The risk of differing ground conditions is at the roots of many issues in contracting processes. When the ground within which a tunnel is to be built is worse than expected, the tunnel shall be more expensive and take longer to build than anticipated. Nowadays, fixed price-fixed time contracts, as they are often successfully used in high-rise, have not proven to be effective in underground works: causing higher costs and time overrun.

FIDIC (The International Federation of Consulting Engineers) and ITA-AITES (The International Tunnelling and Underground Space Association), both organizations recognized by the UN, by the World Bank, by Development Banks and by the International Tunnel Insurers Group ITIG, have formed a joint Task Group (TG 10) to propose a new Form of Contract for Underground Works : **The Emerald Book**.

Approached during round tables of the Open Session, the major points included in the Emerald Book are:

- Balanced sharing of the ground related risks between owners (ground conditions risks) /contractors (time and cost risks in the expected ground conditions)
- Provisions for dealing with unforeseeable ground conditions will be included in the General Conditions of Contract
- A provision for a standing *Dispute Avoidance and Adjudication Board* (DAAB)
- A guidance for the preparation of tender documents



- **INNOVATIVE INITIATIVE TO FACE WASTEWATER TREATMENT ISSUES IN THE MIDDLE EAST : THE “STEP” EXAMPLE**

Abu Dhabi Sewerage Services Company (ADSSC) has developed **Strategic Tunnel Enhancement Programme (STEP)**, a huge gravity-driven hydraulic wastewater tunnel network solution to relieve the hydraulic burden on the existing sewerage network and to accommodate the demand created by the projected population growth in the Emirate of Abu Dhabi.

The deep gravity sewerage system's aim is to collect wastewater in Abu Dhabi Island and mainland. The programme includes one of the deepest gravity sewer tunnels in the world, and the first and largest in the Gulf Region.

The 41 km long deep sewer tunnel was completed using a total of **8 Earth Pressure Balance (EPB)** Tunnel Boring Machines (TBMs) utilizing a pre-cast concrete bolted segmental structural lining along its entire length.

The tunnel varied in depth from **30 to 85m deep** and the **17 shafts** along the tunnel route (at approximately 2.5 km centres) were all constructed using diaphragm walls for temporary ground support. The finished internal diameter of the tunnel varied from 4 m to 5.5 m which included a corrosion protection lining comprising an HDPE primary lining and unreinforced concrete secondary lining to protect the tunnel from acid attack and corrosive compounds typically found in sanitary waste water environments.

In addition to the 41 km deep tunnel, **STEP includes 45 km of “link sewers”** to connect the existing sewerage system to the new deep tunnel, and one large pumping station which will accommodate an average wastewater flow of **1.7 million m³/day by 2030**.

The whole congress showcased the best of the tunnelling industry, and the upcoming evolutions of underground construction seem to lie in digital applications and innovative concepts of underground space. When will the TBM's be completely autonomous? How IA systems already working for aeronautics, rail and automotive industries can be applied to the tunnelling? All these questions underlined the congress and shall be addressed in a short-term future.

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